

Community behavioral change and management of COVID-19 Pandemic: Evidence from Indonesia

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Original article

Community behavioral change and management of COVID-19 Pandemic: Evidence from Indonesia



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ABSTRACT

Objectives: This study aims to investigate the effect of information and motivation on behavioral change related to the COVID-19 pandemic management in Indonesia. It also examines the role of behavioral skills in mediating the information-behavioral change relationship and the motivation-behavioral change relationship.

Method: This study employs the partial least squares structural equation modeling (PLS-SEM) to test the research hypotheses. Using the online survey method to collect data, 845 responses were obtained from several main islands of Indonesia.

Results: The results of the study show that information and motivation positively influence people's behavior changes. Behavioral skills mediate the influence of information and motivation on behavioral change. This study contributes to the development of the information-motivation-behavior model (IMB-Model). It also provides additional knowledge on pandemic management in the research setting of Indonesia as a country that has complex characteristics in terms of religion and belief, demography, culture, economy, and politics.

Conclusions: This study concludes that the success of Indonesia in dealing with the pandemic greatly depends on the success of changing the community behavior. Providing reliable and consistent information enhances people's motivation to build their behavioral skills. With increased behavioral skills, people have changed their behavior in fighting against COVID-19 by obeying health protocols, participating in vaccination programs, and practicing a healthier lifestyle.

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1. Introduction

COVID-19 has become a global pandemic since the WHO (World Health Organization) announced it on March 11, 2020 (Sebayang, 2020). Referring to the WHO data, the virus has spread to 220 countries with infected cases of more than 198 million peo-

ple and the number of deaths of more than 4 million people worldwide until July 31, 2021 (World Health Organization, 2021a). No single country has experience in dealing with the COVID-19 pandemic. Indonesia has been fighting the COVID-19 pandemic since early March 2020. Fig. 1 shows the development of COVID-19 in Indonesia from March 2020 to October 2021 with three outbreaks. Based on the assessment of John Hopkins University, Indonesia has succeeded in reducing 58 % of COVID-19 cases in just 2 weeks (Setiyadi, 2021). The Director-General of WHO stated that Indonesia is one of the countries with the best achievement in vaccination programs compared to other countries in the world (Deni, 2022). As of October 12, 2021, there was a drastic decrease in the number of daily confirmed cases, confirmed deaths, and confirmed recoveries (covid.go.id, 2021).

This study employs the Information-Motivation-Behavioral Skills Model (IMB-Model) by Fisher and Fisher (1992) stating that changes in a person's behavior are influenced by their behavioral skills. Behavioral skills are influenced by two factors, namely: (1)

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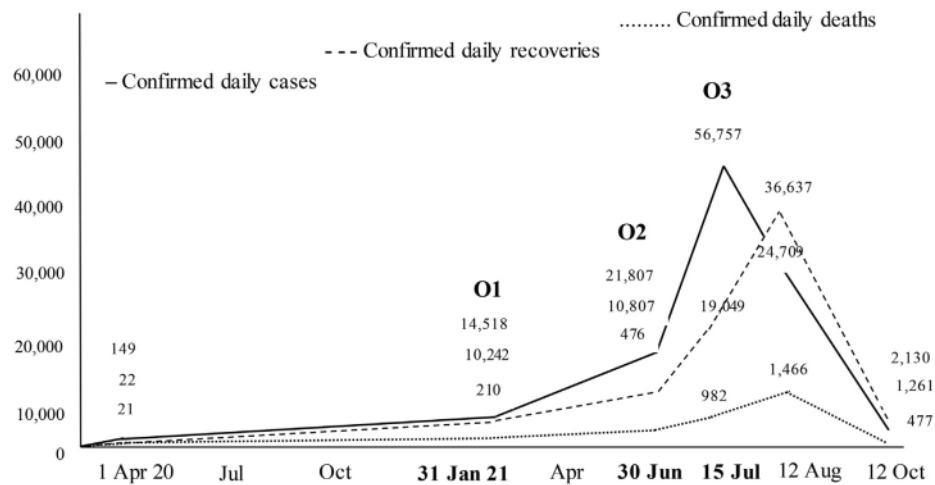


Fig. 1. Development of COVID-19 in Indonesia Source: www.covid19.go.id (processed by authors) Note: O1 = First Outbreak; O2 = Second Outbreak; O3 = Third Outbreak.

information, and (2) motivation. The model generates an increased self-efficacy knowledge as well as the quality and quantity of disease prevention behavior (Lee and Park, 2021).

The results of previous studies regarding the effect of information on behavioral skills are still inconsistent. Some scholars have revealed that information influences behavioral change (Luo et al. 2020; Fleary et al., 2020; Lee and Park, 2021). However, Nelson et al. (2018) proved that information has no effect on medication adherence. Thus, it does not show a change in behavior. Similarly, the results of previous studies regarding the effect of motivation on behavioral change are also inconsistent. Studies by previous scholars (Luo et al., 2020; Fisher et al., 2003; Lee and Park 2021) showed that motivation influences health behavioral change. Other researchers (Mayberry and Osborn, 2014; Nelson et al., 2018) revealed that personal and social motivation does not affect medication adherence and does not show any behavioral changes. This research gap motivates this current study to use the IMB-Model to analyze the community behavioral change in Indonesia during the COVID-19 pandemic.

This study is important for Indonesia which has unique characteristics in terms of demographic, geographical, cultural, social, economic, and political aspects. With the fourth largest population in the world and 17,000 islands, Indonesia needs a special approach to dealing with the COVID-19 pandemic. The results of this study can be used as a reference by other countries to change people's behavior as the main key to controlling the COVID-19 pandemic.

2. Literature review and hypothesis development

2.1. Information Motivation Behavioral Skills Model (IMB-Model)

The IMB-Model of Fisher and Fisher (1992) explains that information, motivation, and behavioral skills are determinants of preventive behavior. If a person has adequate information and is well-motivated, he or she will acquire behavioral skills and apply these skills to change behavior. Behavioral skills are related to a variety of skills, such as practical knowledge, skills, and self-confidence or beliefs that lead to behavior. In the current study, information, motivation, behavioral skills, and behavioral change refer to behavioral changes in the 5Ms (wearing masks, washing hands, keeping a distance, staying away from crowds, reducing mobility) and 3Ts

(tracing, testing, treatment), as well as participation in the vaccination program by the government.

2.2. Information and behavioral change

Luo et al. (2020) showed that information influences health behavior during COVID-19. Chen et al. (2018) demonstrated that information influences self-management behavior. Other scholars (Fisher et al., 2003; Fleary et al., 2020; Lee and Park, 2021; Ferri et al., 2021) also revealed that information affects health behavior. In Indonesia, the information obtained by the public is remarkably diverse. The more accurate and reliable information, the higher the chance people change their behavior. Thus, the following hypothesis is proposed:

H₁. Information is positively associated with behavioral change.

2.3. Motivation and behavioral change

Motivation influences behavioral change. Fleary et al. (2020) revealed that inadequate consumption of fruits and vegetables in adolescents can increase the risk of chronic diseases. Motivation explains the changes in fruit and vegetable consumption behavior. Other studies (Luo et al., 2020; Fisher et al., 2003; Lee and Park 2021; Ferri et al., 2021) demonstrated the same results. This study argues that the higher the motivation, the higher the chance of behavioral change. Then, the following hypothesis is proposed:

H₂. Motivation is positively associated with behavioral change.

2.4. Information and behavioral skills

Information affects behavioral skills. Alexander et al. (2017) revealed that information affects behavioral skills on medication adherence of patients with rare diseases. Other studies (Fisher and Fisher, 2006; Mayberry and Osborn, 2014; John et al., 2017; Luo et al., 2020; Ferri et al., 2021) also demonstrated the same results. This study argues that the more reliable the information, the better the behavioral skills of the community. Therefore, the following hypothesis is proposed:

H₃. Information is positively associated with behavioral skills.

2.5. Motivation and behavioral skills

Motivation affects behavioral skills. Lee and Park (2021) showed that motivation influences behavioral skills on preventive behavior against respiratory infections. Other scholars (Fisher and Fisher, 2006; Mayberry and Osborn, 2014; John et al., 2017; Chen et al., 2018; Luo et al., 2020; Ferarri et al., 2021) also proved the same results. This study argues that the higher the motivation, the higher the people have behavioral skills. Thus, the following hypothesis is proposed:

H₄. Motivation is positively associated with behavioral skills.

2.6. Behavioral skills and behavioral change

Behavior change is a core component of self-management and compliance (Chang et al. 2014). Ferarri et al. (2021) revealed that behavioral skills have a direct influence on behavioral changes in physical activities. Other studies (Fisher and Fisher, 2006; John et al., 2017; Chen et al., 2018; Luo et al., 2020; Ferarri et al., 2021) demonstrated that behavioral skills also influence health behavioral change. Luo et al. (2020) stated that behavioral skills have the greatest impact on health behavior change. The higher the behavioral skills, the higher the chance of changing behavior. Then, the following hypothesis is proposed:

H₅. Behavior skills are positively associated with behavioral change.

2.7. Mediating role of behavioral skills on information-behavioral change relationship

Reliable information will build people's behavioral skills. This information will form the public self-awareness to make behavioral changes in the forms of consistently implementing the 5Ms health protocol, following the 3Ts practices, and participating in the vaccination program. The more reliable the information, the higher the behavioral skills, and then the greater the chance for behavioral change. Therefore, the following hypothesis is proposed:

H₆. Behavioral skills mediate information-behavioral change relationship.

2.8. Mediating role of behavioral skills on motivation-behavioral change relationship

People's behavioral skills are formed from personal motivation (self-awareness, fear of being infected, fear of infecting others) and social motivation (following the government, international organizations, and the community). This form of personal and social motivation will increase their behavior skills, then enhances the chance to change their behavior. The higher the motivation, the higher their behavioral skills, and the higher the behavioral change. Thus, the following is proposed:

H₇. Behavioral skills mediate motivation-behavioral change relationship.

Fig. 2 depicts the research conceptual framework of IMB-Model. The model is used to explain the relationship of four constructs employed by the current study, namely information, motivation, behavioral skills, and behavioral change.

3. Methodology

3.1. Sample and data collection

This study employs the snowball sampling method to obtain a wide sample based on a small sample and makes it easier to collect qualitative data (Cooper & Schindler, 2014: 360). Primary data were collected using an online survey. A pilot test that was conducted on 50 people in Surabaya confirmed the validity and reliability. Furthermore, 10 to 15 questionnaires were sent to respondents throughout Indonesia via the WhatsApp application. The online focus group discussions (FGD) were conducted in three regions with the representatives of various community groups as presented in Table 1. FGD was conducted using the following key questions: (1) What are the reliable sources of information on COVID-19? (2) Which forms of communication are the most effective? (3) Who are the parties conveying information? (4) What kind of media are used? (5) What are the motivations that make people change their behavior? and (6) What are the type of behavioral changes? Table 1 shows the participants of the FGD.

3.2. Definitions and measurements

Behavioral change. Behavioral change is defined as a change that a person makes to comply with health rules. Behavioral change is measured using six statements developed by Vannabouathong et al. (2020), Michie and West (2021), and Lee et al. (2021) which consist of the following main items: (1) application of the 5Ms health protocol, (2) healthy living behavior, both physically and mentally, (3) good behavior in spiritual life, (4) following 3Ts practices, (5) participating the vaccination program, (6) behavior on digital technology and non-contact-based technology. A Likert scale rating from 1 (strongly disagree) to 5 (strongly agree) is used.

Behavioral skills. Behavioral skills are defined as beliefs (self-efficacy) and skills to use. Behavioral skills are measured by 12 statements developed by previous researchers (Robinson, 2017; Tsamslag et al., 2020) which consist of the following main items: (1) implementing programs consistently, orderly, and correctly to prevent COVID-19, (2) consistently implements self-awareness programs without being influenced by sanctions/punishments, (3) implementing programs without being influenced by government assistance, and (4) implementing programs without being influenced by various community leaders. A Likert scale rating from 1 (strongly unsure) to 5 (strongly sure) is used. The higher the score, the higher the behavioral skills associated with health behavior change.

Information. Information refers to the basic knowledge about the disease, health conditions, and preventive behavior. The information can be from the central/regional government, printed and electronic media, social media, and chat applications such as the WhatsApp groups. Information is measured using 16 statements developed by previous scholars (Robinson, 2017; Tsamslag et al., 2020) consisting of the following main items: (1) information related to COVID-19, (2) information on the implementation of the 5Ms health protocol, (3) information about the 3Ts practices, and (4) information on the benefits of vaccination. A Likert scale rating from 1 (very ignorant) to 5 (very knowledgeable) is used.

Motivation. Motivation refers to attitudes toward health behaviors, beliefs of intervention outcomes to minimize the spread of COVID-19, and social support to engage in certain behaviors. Motivation is measured using 12 statements developed by previous scholars (Robinson, 2017; Tsamslag et al., 2020; Michie & West, 2021) which consists of the following main items: (1) implementing the program in an orderly and correct manner to prevent and minimize COVID-19, (2) following government advice to imple-

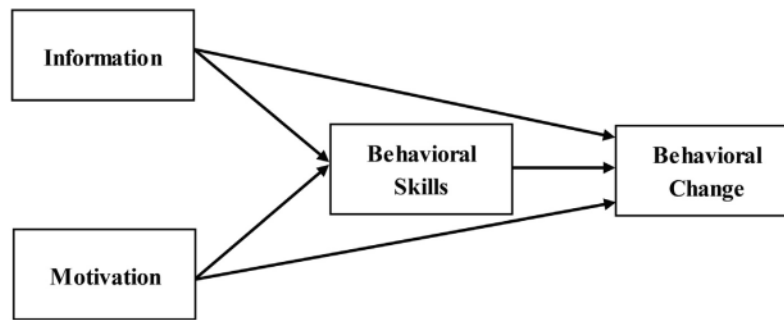


Fig. 2. Information Motivation Behavioral Skills Model (IMB-Model).

Table 1
Participants of FGD.

Background	Region				Total
	East Java	Central Java	Bali	South Kalimantan	
Covid-19 survivors	1	1	2	1	5
University Students	3	2	2	2	9
Epidemiologist	1	1	1	1	4
Public Health Officers	1	1	1	1	4
Lecturers	3	2	2	2	9
Researchers	2	1	2	1	6
Community Leaders	1	1	2	1	5
Religious leaders	2	2	2	1	7
COVID-19 Task Force	1	2	1	1	5
Local COVID-19 Task Force	1	1	1	2	5
Women and gender activist	1	0	1	1	3
Representative of Health Office	1	1	1	1	4
Head of Women Association	0	0	1	1	2
NGO Representatives	1	0	1	1	3
Total	19	15	20	17	71

ment programs, (3) following international organization' recommendations to implement programs, (4) following the majority of the population to implement programs. A Likert scale rating from 1 (strongly disagree) to 5 (strongly agree) is used. The higher the score, the higher the motivation.

4. Results

4.1. Characteristics of respondents

Table 2 shows that the respondents are dominated by male respondents with more than 40 years old. Their last education is mostly master's degrees, undergraduate degrees, and senior high schools. Their occupations are mostly lecturer/teacher, students, and employees.

4.2. Descriptive statistics

The following interval class calculation is needed to categorize the respondents' answers.

$$\text{Interval class} = \frac{(\text{Highest score} - \text{Lowest Score})}{\text{Number of classes}}$$

$$\text{Interval class} = \frac{(5 - 1)}{5} = 0,8$$

Based on the calculation, the respondents' answers are categorized in Table 3:

Table 4 presents the result of descriptive statistics showing the categorization of the respondents' answers. In summary, the answers tend to "agree" and "strongly agree".

Table 2
Characteristics of Respondents.

Classification	Description	Frequency	
		Absolute	Percentage
Gender	Male	548	64.9 %
	Female	297	35.1 %
	Total	845	100 %
Age	17 – 25 years	297	35.1 %
	25 – 40 years	211	25 %
	>40 years	337	39.9 %
	Total	845	100 %
Education	Junior High School	4	0.5 %
	Senior High School	234	27.7 %
	Diploma 3	51	6 %
	Undergraduate	229	27.1 %
	Master	239	28.3 %
	Doctoral	88	10.4 %
Total	845	100 %	
Occupation	Housewives	29	3.4 %
	Entrepreneurs	50	
	Civil Servants	73	
	SOEs employees	9	
	Company Employees	133	
	Students	222	
	Army/ Police	3	
	Lecturer/Teacher	260	
	No occupation	23	
	Others	43	
	Total	845	100 %

Table 3
Category of respondents' answers.

Interval	Category
1.00 < α < 1.80	Strongly disagree/ignorant/unsure
1.80 < α < 2.60	Disagree
2.60 < α < 3.40	Neutral
3.40 < α < 4.20	Agree
4.20 < α < 5.00	Strongly agree/knowledgeable/sure

4.3. Measurement model analysis

The PLS-SEM was employed because of its capability to simultaneously analyze many latent variables with various indicators (Hair, Ringle, and Sarstedt, 2013). Table 5 and Table 6 present the convergent validity and discriminant validity. In the first iteration, the factor loading value of BC 3 (good behavior in spiritual life) is <0.5, and it was deleted from the measurement model. In summary, the measurement model is valid and reliable.

4.4. Structural model analysis

Structural model analysis has two stages, namely: (1) direct effect test, and (2) indirect effect test. Table 7 shows the results the direct effect test (Panel A) and indirect test (Panel B).

Fig. 3 presents the results of the full model test. It shows that all paths are significant.

Before including the behavioral skills as the mediating variable, the results (Panel A) show that H₁ is supported and H₂ is supported. After including behavioral skills as the mediating variable, the results (Panel B) reveal that H₃, H₄, and H₅ are also supported. The β coefficient of the information-behavioral change relationship decreases from 0.22 to 0.074 and is significant. The β coefficient of the motivation-behavioral change relationship decreases from 0.399 to 0.151 and is significant. According to Baron and Kenny (1986), the results indicate the existence of partial mediation. Hence, H₆ and H₇ are supported.

5. Discussions

5.1. Information and behavioral change

This study provides empirical evidence for the hypothesis stating that information has a positive effect on behavior change. The results support some previous scholars (Chen et al., 2018; Luo et al., 2020; Fisher et al., 2003; Fleary et al., 2020; Lee & Park, 2021). As presented in Table 8, additional information obtained from the questionnaires and focus group discussions also supports the first hypothesis. First, the public receives information on COVID-19 from the Central/Regional Government as their most trusted source of information.

Second, the type of media which is the most widely accessed by the public is social media as presented in Table 9. Television and online media are also the next choices.

Table 4
Descriptive statistics.

Variable	Score		Mean	Category
	Min	Max		
Information	1	5	4.32	Very knowledgeable
Motivation	1	5	4.36	Strongly agree
Behavioral Skills	1	5	4.33	Strongly sure
Behavioral Change	1	5	4.52	Strongly agree

5.2. Motivation and behavioral change

The results prove that motivation has a positive effect on behavior change. These results support previous scholars (Fleary et al., 2020; Luo et al., 2020; Fisher et al., 2003; Lee & Park 2021; Ferarri et al., 2021). Table 10 shows that motivation to implement health protocols is based on the motivation of fear of infecting other people (parents, children, etc.). The motivation encourages people to change their behavior to consistently implement the health protocols.

5.3. Information and behavioral skills

The results prove that information has a positive effect on behavioral skills. The results support the studies of previous researchers (Fisher & Fisher, 2006; Mayberry & Osborn, 2014; John et al., 2017; Alexander et al., 2017; Nelson et al., 2018; Luo et al., 2020). Respondents believe that the information they get will form their behavioral skills. The campaign for the 5Ms health protocol, 3 T practices, and vaccination program is one of the efforts to provide reliable information for people to have behavioral skills to fight the virus.

5.4. Motivation and behavioral skills

This study proves that motivation has a positive effect on behavioral skills. The results support studies conducted by the previous researchers (Lee & Park, 2021; Fisher & Fisher, 2006; Mayberry & Osborn, 2014; John et al., 2017; Chen et al., 2018; Luo et al., 2020; Ferrari et al., 2021). Respondents strongly believe that motivation such as fear of infecting others, self-awareness, and fear of being infected by the virus will build the community's behavioral skills to fight against the virus.

5.5. Behavioral skills and behavioral change

The results prove that behavioral skills have a positive effect on behavior change. The results support the previous researchers (Fisher & Fisher, 2006; John et al., 2017; Chen et al., 2018; Luo et al., 2020; Ferarri et al., 2021). The behavioral skills are reflected in the people's capabilities to implement the 5Ms health protocol, the 3Ts practices, and other government programs without being influenced by punishment, government assistance, leaders, family, community, and colleagues.

5.6. Mediating role of behavioral skills on information-behavioral change relationship

This study proves that behavioral skills mediate the effect of information on behavior change. The community gets information from both digital and conventional types of media. Based on this information, the community increases their self-awareness and behavioral skills that are ready to be used for action. These behavioral skills serve as the basis for behavioral change to support COVID-19 pandemic management programs such as implementing the 5Ms health protocol in daily life, participating in the 3Ts pro-

Table 5
Results of measurement model analysis.

Variable	Indicator	Factor Loading	Variable	Indicator	Factor Loading
Information (Composite Reliability = 0.853; Cronbach's Alpha = 0.847; AVE = 0.560)			Behavioral Skills (Composite Reliability = 0.868; Cronbach's Alpha = 0.864; AVE = 0.716)		
Information	IN1	0.727	Behavioral skills	BS1	0.776
	IN2	0.718		BS2	0.806
	IN3	0.632		BS3	0.816
	IN4	0.737		BS4	0.857
	IN5	0.778		BS5	0.859
	IN6	0.786		BS6	0.859
	IN7	0.778		BS7	0.872
	IN8	0.793		BS8	0.894
	IN9	0.792		BS9	0.870
	IN10	0.727		BS10	0.814
	IN11	0.711		BS11	0.843
	IN12	0.702		BS12	0.855
	IN13	0.777			
	IN14	0.807			
	IN15	0.746			
	IN16	0.744			
Motivation (Composite Reliability = 0.853; Cronbach's Alpha = 0.847; AVE = 0.630)			Behavioral Change (Composite Reliability = 0.858; Cronbach's Alpha = 0.796; AVE = 0.550)		
Motivation	MO1	0.808	Behavioral Change	BC1	0.814
	MO2	0.825		BC2	0.608
	MO3	0.817		BC4	0.779
	MO4	0.852		BC5	0.777
	MO5	0.866		BC6	0.710
	MO6	0.850			
	MO7	0.777			
	MO8	0.814			
	MO9	0.832			
	MO10	0.644			
	MO11	0.674			
	MO12	0.726			

Table 6
Results of discriminant validity test.

	IN	MO	BS	BC
Information (IN)	0.748	0.588	0.626	0.453
Motivation (MO)	0.588	0.793	0.708	0.532
Behavioral skills (BS)	0.626	0.708	0.846	0.617
Behavioral Change (BC)	0.453	0.532	0.617	0.741

Table 7
Results of direct effect test.

Panel A: Direct effect test before including a mediation			Decision
Variable	β	P-Value	
Information → Behavioral Change	0.222	0.000***	H1: supported
Motivation → Behavioral Change	0.399	0.000***	H2: supported
Panel B: Direct effect test after including a mediation			
Variable	β	P-Value	
Information → Behavioral Change	0.074	0.084*	
Motivation → Behavioral Change	0.151	0.002***	
Information → Behavioral skills	0.320	0.000***	H3: supported
Motivation → Behavioral skills	0.520	0.000***	H4: supported
Behavioral skills → Behavioral Change	0.463	0.000***	H5: supported

Note: *** $P < 0.01$; ** $P < 0.05$; * $P < 0.1$.

gram, participating in the vaccination program, and living in a healthy lifestyle.

5.7. Mediating role of behavioral skills on motivation-behavioral change relationship

The results prove that behavioral skills mediate the influence of motivation on behavioral change. Personal motivation (self-

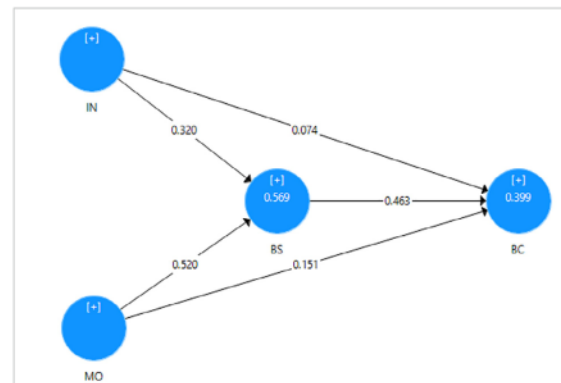


Fig. 3. Results of Full Model.

awareness, fear of infecting others, and fear of being infected by the COVID-19 virus) and social motivation (following the government, international organizations, and the community) have shaped the people's behavioral skills that are used to change their

Table 8
Results of sources of information on COVID-19.

#	Sources of information	5Ms health protocol (%)	3Ts practices (%)	Vaccination program (%)
1	Central/ Regional Government	72.5	68.3	72.4
2	Self-searching	42.6	38.2	34.3
3	Workplace	29.7	28.2	32.1
4	Family	28.1	23.2	25.8
5	University/Schools	23.9	19.5	23.4
6	Friends	18.7	15.2	19.9
7	Community figures	17.4	15.9	13.5
8	Neighbors	12.7	9.9	15.1
9	Religious figures	8.8	6.5	7.1
10	None	0.5	2.5	0.5

a. Each respondent is required to choose at least three sources of information regarding the 5Ms health protocol, 3 Ts practices, and vaccination program.

Table 9
Results of media types.

#	Media types	5Ms health protocol (%)	3Ts practices (%)	Vaccination program (%)
1	Social media	76.3	70.7	71.9
2	Television	51.9	44.9	44.6
3	Online media	46.7	42.1	43.2
4	WhatsApp Group	38.8	33.2	39.4
5	Local governments' announcements	33.4	30.5	38.8
6	Public poster	22.4	16.9	16.5
7	Newspaper, magazine	11.2	10.8	10.1
8	Other network applications	10.1	9.2	11.2
9	Radio	8.2	7.3	7.6
10	Public figures	8.2	6.9	9.2

Table 10
Results of motivation survey.

#	Motivation	5Ms health protocol (%)	3Ts practices (%)	Vaccination program (%)
1	Fear of infecting others	63.6	61.7	55.4
2	Self-awareness	62.5	58.6	58.5
3	Fear of being infected	61.7	57.6	54.7
4	More protected	48.9	46.9	51.9
5	Good role model	30.9	27.1	29.1
6	Pride to participate	30.2	27.6	30.4
7	A normal citizen	9.7	11.2	12.3
8	Fear of being punished	7.1	7.8	9.7
9	Feeling of shame	1.8	1.2	1.1

behavior, especially in implementing the 5Ms health protocol their daily life, following the 3Ts practices, vaccination program, and living in a healthier lifestyle.

6. Conclusions

Using 845 data and employing PLS-SEM, this study concludes that information and motivation affect behavioral change, and behavioral skills mediate the information-behavioral change relationship as well as the motivation-behavioral change relationship. This study has the following limitations. First, the study limits its sample size to only 845 respondents. Second, the use of snowball sampling might raise the issue of randomness. Third, the use of an online survey method and online questionnaires have caused some respondents difficulty due to their digital illiteracy. Due to the limitations, caution must be applied when generalizing the results of this study.

Theoretically, this study contributes to the IMB-Model by providing empirical evidence in the research setting of Indonesia. Practically, this study reveals some mechanisms for how to manage the COVID-19 pandemic focusing on behavioral change and the principle of *gotong royong* (togetherness). This mechanism is useful information for managing the pandemic because there is

no single country in the world that has the experience to handle the COVID-19 pandemic.

Future researchers are recommended to do the following: (1) using the qualitative approach to improve the depth of the analysis; (2) employing the experiment method for better assessing the causal effect; (3) testing the IMB-Model using a bigger sample size; and (4) conducting further studies regarding the community behavioral change during the post-pandemic era (new normal era).

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

- Alexander, D.S., Hogan, S.L., Jordan, J.M., DeVellis, R.F., Carpenter, D.M., 2017. Examining whether the information-motivation-behavioral skills model predicts medication adherence for patients with a rare disease. *Patient Prefer. Adherence* 11, 75–83. <https://doi.org/10.2147/PPA.S115272>.
- Baron, R.M., Kenny, D.A., 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. Pers. Soc. Psychol.* 51 (6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>.
- Chang, S.J., Choi, S., Kim, S.A., Song, M., 2014. Intervention strategies based on information-motivation-behavioral skills model for health behavior change: a systematic review. *Asian Nurs. Res.* 8 (3), 172–181. <https://doi.org/10.1016/j.anr.2014.08.002>.
- Chen, Q., Wang, H., Wang, Y., Wang, Z., Zhao, D., Cai, Y., 2018. Exploring effects of self-management on glycemic control using a modified information-motivation-behavioral skills model in type 2 diabetes mellitus patients in Shanghai, China: a cross-sectional study. *J. Diabetes* 10 (9), 734–743. <https://doi.org/10.1111/1753-0407.12655>.
- Cooper, D., Schindler, P.S., 2014. *Bussines Research Methods*. McGraw Hill, New York.
- Covid19, 2021a. Analisis Data COVID-19 Indonesia (Update 1 Agustus 2021). <https://covid19.go.id/p/berita/analisis-data-covid-19-indonesia-update-1-agustus-2021>. (accessed 12 August 2021).
- Deni, Reza, 2022. Kepada Presiden Jokowi, Dirjen WHO Apresiasi Keberhasilan Indonesia Kendalikan Pandemi Covid-19. <https://www.tribunnews.com/nasional/2022/06/21/kepada-presiden-jokowi-dirjen-who-apresiasi-keberhasilan-indonesia-kendalikan-pandemi-covid-19> (accessed on 26 June 2022).
- Ferrari, M., Speight, J., Beath, A., Browne, J.L., Mosely, K., 2021. The information-motivation-behavioral skills model explains physical activity levels for adults with type 2 diabetes across all weight classes. *Psychol. Health Med.* 26 (3), 381–394. <https://doi.org/10.1080/13548506.2020.1749292>.
- Fisher, J.D., Fisher, W.A., 1992. Changing AIDS-risk behavior. *Psychol. Bull.* 111 (3), 455–474. <https://doi.org/10.1037/0033-2909.111.3.455>.
- Fisher, W.A., Fisher, J.D., Harman, J., 2003. The information-motivation-behavioral skills model: A general social psychological approach to understanding and promoting health behavior. In: Suls, J., Wallston, K. (Eds.), *Social Psychological Foundations of Health and Illness*. Blackwell, London, pp. 87–106. <https://doi.org/10.1002/9780470753552.ch4>.
- Fisher, J.D., Fisher, W.A., Amico, K.R., Harman, J.J., 2006. An information-motivation-behavioral skills model of adherence to antiretroviral therapy. *Health Psychol.* 25 (4), 462–473. <https://doi.org/10.1037/0278-6133.25.4.462>.
- Fleary, S.A., Joseph, P., Chang, H., 2020. Applying the information-motivation-behavioral skills model to explain adolescents' fruits and vegetables consumption. *Appetite* 147. <https://doi.org/10.1016/j.appet.2019.104546>.
- Hair, J.F., Ringle, C.M., Sarstedt, M., 2013. Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Plan.* 46 (1–2), 1–12. <https://doi.org/10.1016/j.lrp.2013.01.001>.
- John, S.A., Walsh, J.L., Weinhardt, L.S., 2017. The Information-Motivation-Behavioral skills model revisited: A network-perspective structural equation model within a public sexually transmitted infection clinic sample of hazardous alcohol users. *AIDS and Behavior.* 21 (4), 1208–1218. <https://doi.org/10.1007/s10461-016-1446-2>.
- Lee, J., Allen, J., Lim, H., Choi, G., 2021. Determinants of behavioral changes since COVID-19 among middle school students. *Healthcare.* 9 (1), 75. <https://doi.org/10.3390/healthcare9010075>.
- Lee, M.H., Park, Y.-H., 2021. The effectiveness of the information-motivation-behavioral skills model-based intervention on preventive behaviors against respiratory infection among community-dwelling older adults. *Patient Education and Counseling* 104 (8), 2028–2036.
- Luo, Y., Yao, L., Zhou, L., Yuan, F., Zhong, X., 2020. Factors influencing health behaviours during the coronavirus disease 2019 outbreak in China: an extended information-motivation-behaviour skills model. *Public Health* 185, 298–305. <https://doi.org/10.1016/j.puhe.2020.06.057>.
- Mayberry, L.S., Osborn, C.Y., 2014. Empirical validation of the Information-Motivation-Behavioral Skills Model of diabetes medication adherence: a framework for intervention. *Diabetes Care* 37 (5), 1246–1253. <https://doi.org/10.2337/dc13-1828>.
- Michie, S., West, R., 2021. Sustained behavior change is key to preventing and tackling future pandemics. *Nat. Med.* 27 (5), 749–752. <https://doi.org/10.1038/s41591-021-01345-2>.
- Nelson, L.A., Wallston, K.A., Kripalani, S., LeSturgeon, L.M., Williamson, S.E., Mayberry, L.S., 2018. Assessing barriers to diabetes medication adherence using the Information-Motivation-Behavioral skills model. *Diabetes Res. Clin. Pract.* 142, 374–384. <https://doi.org/10.1016/j.diabres.2018.05.046> (accessed on 20 August 2021).
- Robinson, W. T., 2017. Adaptation of the information-motivation-behavioral skills model to needle sharing behaviors and Hepatitis C risk: A structural equation model. *Sage Open.* 7 (1), 2158244016666126. <https://doi.org/10.1177/2158244016666126>.
- Sebayang, R. 2020. Alert! WHO Resmi Tetapkan Corona Pandemi. <https://www.cncbincindonesia.com/news/20200312064200-4-144245/alert-who-resmi-tetapkan-corona-pandemi> (accessed on 7 August 2021).
- Setiyadi, Bima, 2021. Berhasil Turunkan 58% Covid-19 Dalam 2 Pekan, Indonesia Menjadi Salah Satu Terbaik di Dunia. <https://www.okezone.com/tren/read/2021/09/21/620/2474661/berhasil-turunkan-58-covid-19-dalam-2-pekan-indonesia-menjadi-salah-satu-terbaik-di-dunia> (accessed on 26 June 2022).
- Tsamlag, L., Wang, H., Shen, Q., Shi, Y., Zhang, S., Chang, R., Liu, X., Shen, T., Cai, Y., 2020. Applying the information-motivation-behavioral model to explore the influencing factors of self-management behavior among osteoporosis patients. *BMC Public Health* 20 (1). <https://doi.org/10.1186/s12889-020-8292-x>.
- Vannabouathong, C., Devji, T., Ekhtiari, S., Chang, Y., Phillips, S.A., Zhu, M., Chagla, Z., Main, C., Bhandari, M., 2020. Novel coronavirus COVID-19: current evidence and evolving strategies. *J. Bone Joint Surg.* 102 (9), 734–744.
- World Health Organization, 2021a. Coronavirus Disease (COVID-19) Pandemic. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> (accessed 31 July 2021)

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