# Factors Affecting the Perceived Effectiveness in Preventing the Transmission of COVID-19 in Indonesia: Integrating the Extended Theory of Planned Behavior and Health Belief Model

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## ABSTRACT

The coronavirus (COVID-19) is an infectious disease declared a pandemic worldwide by the World Health Organization (WHO). The purpose of the research was to look at the factors in public health behavior that affected the effectiveness of preventing the transmission of the COVID-19 based on the extended Theory of Planned Behavior (TPB) and Health Belief Model (HBM). The research was a correlational study. The research applied a purposive sampling method, with 483 respondents coming from various islands in Indonesia. Based on the analysis using Partial Least Square-Structural Equation Modelling (PLS-SEM), TPB factors like individuals' behavioral intention to follow COVID-19 preventive measures are significantly affected by subjective norm and perceived behavior control. On the other hand, personal attitude does not significantly affect an individual's behavioral intention to follow COVID-19 prevention steps. HBM shows an individual's behavior intention to follow the COVID-19 preventive measures is significant and directly affected by perceived severity, perceived barrier, perceived self-efficacy, and cues to action. Meanwhile, the perceived susceptibility and perceived benefits do not significantly and directly influence an individual's behavioral intention to follow the COVID-19 preventive measures. The findings from the research can be used to evaluate the effectiveness in several countries in facing the COVID-19 pandemic.

**Keywords:** perceived effectiveness, COVID-19, Theory of Planned Behavior, Health Belief Model

## INTRODUCTION

The coronavirus, known as COVID-19, is an infectious disease declared a pandemic worldwide by the World Health Organization (WHO). This virus appeared first time in Wuhan, Hubei province, China, at the end of 2019. Local hospital staff found several patients who experienced similar shortness of breath to pneumonia (Zhu *et al*., 2020; Fan *et al*., 2020; Shi

*et al*., 2020). Initially, this virus was likely caused by transmission from animals that were sold in Wuhan to these patients (Shereen, Khan, Kazmi, Bashir, & Siddique, 2020). Finally, researchers from China find that this virus can also transmit to fellow humans through droplets from the suspected patients when coughing, talking, and sneezing to others through their respiratory tract (Xu *et al*., 2020). The incubation period of the virus is 3 to 5 days on average, with a

range of 0 to 24 days (Chan *et al*., 2020). Moreover, COVID-19 has several symptoms, such as fever, cough, inflammation in the nose, fatigue, and respiratory tract infection (Li *et al*., 2020b; Huang *et al*., 2020; Subbarao & Mahanty, 2020).

Since it was declared a pandemic, WHO has issued six strategic policies that governments must carry out worldwide. It consists of providing training to health workers, implementing systems to find suspected patients, accelerating production and ensuring the availability of test kits, identifying places that can be converted into health centers, doing quarantine planning, and focusing on reducing the rate of spread of the virus (WHO, 2021a). Poor and uncontrolled planning will cause an increase in the number of cases faster. Thus, it requires handling that is difficult to control. Meanwhile, strategic planning will help to reduce the number of cases and slow down the peak of the highest cases to easier handling (Shirouyehzad, Jouzdani, & Karimvand, 2020).

Before WHO declares a global pandemic, the Indonesian government has reported no cases of the COVID-19 in Indonesia. It has become a big question for many people (De Salazar, Niehus, Taylor, Buckee, & Lipsitch, 2020) since Indonesia is the fourth country with the most population in the world and a destination for many foreign tourists for vacation. Even the tourists are from several cities in China that is the center of the COVID-19 pandemic. Until the early of March 2020, the government of Indonesia reported the first case.

The COVID-19 pandemic affects several areas (Abdullah, 2020). It happened in economic growth with -5,32% in the second quarter of 2020 (Rizal, 2020). In the tourism sector, a drastic decline also occurred,

reaching only 34,9% in the first quarter of 2020, correlated with decreased air revenue by 207 billion (Jatmiko, 2020). Likewise, import activity decreased by 3,7%, and several industries did unilateral layoffs to more than 1,5 million workers (Hanoatubun, 2020). The Indonesian government has made various attempts to respond to these situations. The attempts carried out are establishing the COVID-19 outbreak as a national disaster with a non-natural disaster status, forming the COVID-19 Response Acceleration Task Force as a one-door COVID-19 information center, carrying out all activities from home (working, studying, and praying from home), designating 100 local hospitals as referral hospitals, and limiting the movement of citizens to a micro-scale (Yunus & Rezki, 2020). Several policies taken by the Indonesian government during the early days of the spread of the virus in Indonesia from February 2020 to February 2021 are summarized in Table 1 (Djalante *et al*., 2020).

Moreover, the COVID-19 pandemic has an impact on changing behavior in people's daily lives. People become more sensitive to their health and hygiene by implementing a clean and healthy lifestyle (Perilaku Hidup Bersih Sehat (PHBS)). It includes frequent hand washing, paying attention to ethics when sneezing and coughing, maintaining distance, not touching the face area without cleaning hands, cooking meat and eggs until it is done, and maintaining a distance, especially with people who have respiratory disorders, such as cough (Kementerian Kesehatan Republik Indonesia, 2020; Sohrabi *et al*., 2020).

Even though there have been many policies taken by the Indonesian government and calls for a clean and healthy lifestyle, positive cases still

Table 1 Policies Taken by the Indonesian

| Date | Issuing agency | Regulation | Reference of Regulation |
|------|----------------|------------|-------------------------|
| February 4, 2020 | Indonesian Ministry of Health | Declaration of COVID-19 as a disease which can cause plague and its response | Decision of MoH No: HK.01.07/MENKES/104/2020 Decision of Head of BNPB 9A/2020 |
| February 28, 2020 | National Disaster Management Authority (BNPB) | Declaration of a special emergency in Indonesia about the COVID-19 epidemic disaster | Decision of Head of BNPB 9A/2020 |
| March 13, 2020 | President of Indonesia | Task force for rapid response to COVID-19 | Presidential Decree (Keppres) 9/2020 |
| March 23, 2020 | Indonesian Ministry of Communication and Information | Acceleration of socialization of prevention of COVID-19 at provincial and district level | Circulated Letter SE 2/2020 |
| March 31, 2020 | President of Indonesia | Big scale of social restriction for accelerating COVID-19 eradication | Government Regulation No. 21/2020 |
| February 8, 2021 | Indonesian Ministry of Internal Affairs | Micro-scale of social restriction for accelerating COVID-19 eradication | Instruction of Ministry of Internal Affairs No. 03/2021 |
| February 20, 2021 | Indonesian Ministry of Internal Affairs | Extension of micro-scale of social restriction for accelerating COVID-19 eradication | Instruction of Ministry of Internal Affairs No. 04/2021 |

increase, and the transmission of this virus is very fast. One of the causes of the rapid transmission of the virus in Indonesia is the psychological impact of people's saturation. They ignore a clean and healthy lifestyle, especially when working (Norberg & Rucker, 2020). Data obtained until February 5, 2021, recorded 104.370.550 people who were confirmed positive and caused 2.271.180 fatalities in 223 countries in the world (WHO, 2021c). Regionally, South-East Asia occupies the 18th position with 13.008.106 positive cases. From that number, Indonesia is the second country with the highest positive cases of COVID-19 after India (WHO, 2021b). Data of positive cases for countries in South-East Asia can be seen in Table 2.

An understanding of disease information and the active role of the community are proven to be influential in overcoming disease outbreaks (Alonge *et al.*, 2019; Schwartz & Yen, 2017). In the recent research, Prasetyo, Castillo, Salonga, Sia, and Seneta (2020) examined people's behavior in the Philippines and found that individual perceptions of personal beliefs (perceived severity) of contracting the COVID-19 were the main thing in the spread of the COVID-19. Moreover, Shahnazi *et al.* (2020) also found that individual perceptions (perceived benefits) in handling the COVID-19 had a significant effect in preventing COVID-19. From these explanations, it can be seen that individual perceptions of whether it is easy to contract the COVID-19 or not affect the transmission of this virus.

There are well-known theories describing public behavior: the Health Belief Model (HBM) and Theory of Planned Behavior (TPB). However, the intention of these two theories is different. The first theory is HBM. The idea of HBM is to reduce or avoid a disease condition and aims to explain and predict public health behavior (Sulat, Prabandari, Sanusi, Hapsari, & Santoso, 2018). In other words, the concepts and relationships contained in HBM integrate synergistically to create a greater understanding of the phenomena that occur, to reduce or avoid a disease condition, and to explain or predict public health behavior (Tarkang & Zotor, 2015). The second theory is the TPB which predicts people's attitudes in preventing COVID-19 transmission.

The use of these two theories has not been widely applied, especially in Indonesia. The research combines two theories to evaluate the behavior of the Indonesians to prevent COVID-19. Although some studies analyze public health behavior using the HBM and TPB, the theories are considered separately. With these two theories, the research evaluates the factors that affect the prevention of COVID-19 transmission in Indonesia. The findings are expected to be used to evaluate the effectiveness of preventing the transmission of COVID-19 in Indonesia and other countries.

To the best of the researchers' knowledge, research on public health behavior by examining the factors that influence the prevention of COVID-19 in Indonesia has not been done much. The research combines two theories (TPB and HBM). Moreover, the research extends the traditional theory of TPB by adding some related variables (Prasetyo *et al.*, 2020). These two theories are combined to see the causal relationship between determined and latent variables. The research aims to see the effectiveness of the behavior to prevent COVID-19 transmission in Indonesia. There are four main references in determining the initial hypothesis: Prasetyo *et al.* (2020) to develop hypotheses in extended TPB theory ($H_1$, $H_2$, $H_3$, $H_{10}$, $H_{11}$, $H_{12}$, and $H_{13}$), Shahnazi *et al.* (2020) for hypotheses in HBM theory ($H_4$, $H_5$, $H_6$, and $H_7$), and Cui, Liao, Lam, Liu, and Fielding (2017) for the hypothesis of perceived self-efficacy and cues to action ($H_8$ and $H_9$). The conceptual model can be seen in Figure 1.

Table 2 COVID-19 Positive Cases and Deaths
in South-East Asia

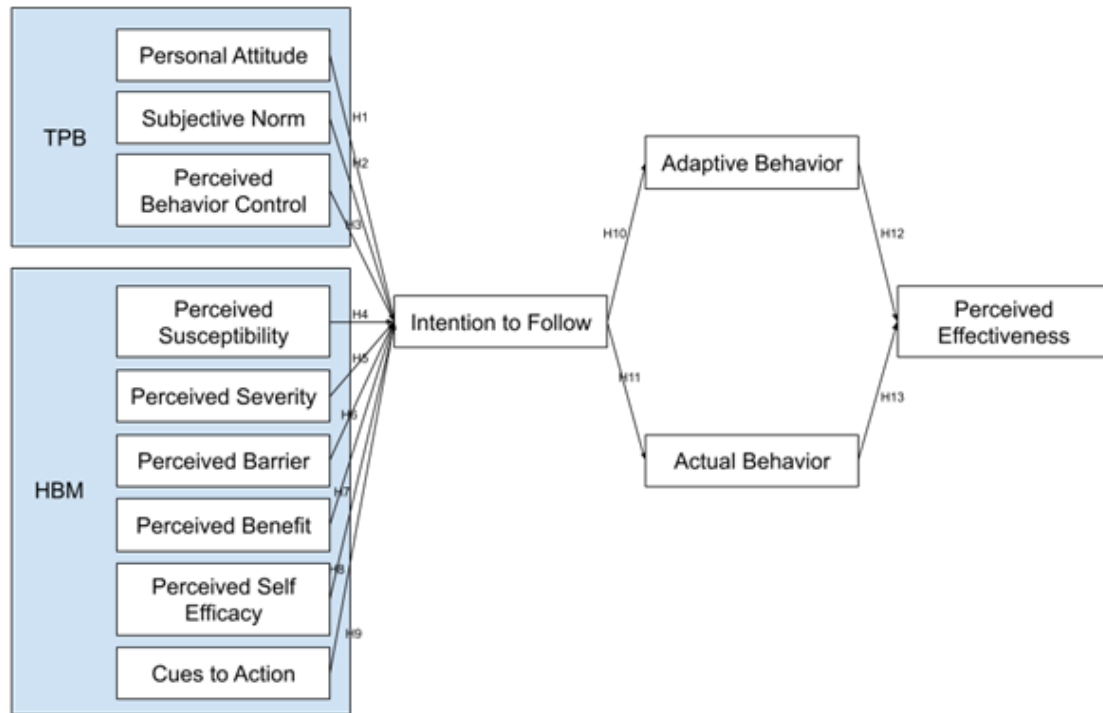| Country | Confirmed cases | Deaths |
|---|---|---|
| India | 10.814.304 | 154.918 |
| Indonesia | 1.134.854 | 31.202 |
| Bangladesh | 537.465 | 8.182 |
| Nepal | 271.707 | 2.035 |
| Myanmar | 141.304 | 3.168 |
| Srilanka | 67.850 | 343 |
| Thailand | 23.134 | 79 |
| Maldives | 16.547 | 54 |
| Bhutan | 861 | 1 |
| Timor Leste | 80 | 0 |
| Democratic People's Republic of Korea | 0 | 0 |

Figure 1 Research Conceptual Model

Based on the explanation, the proposed hypotheses are as follows.

$H_1$ : Individual's behavioral intention to follow COVID-19 prevention measures is significantly affected by their personal attitude.

$H_2$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by subjective norm.

$H_3$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived behavior control.

$H_4$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived susceptibility.

$H_5$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived severity.

$H_6$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived barrier.

$H_7$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived benefit.

$H_8$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by perceived self-efficacy.

$H_9$ : Individual's behavioral intention to follow COVID-19 preventive measures is significantly affected by cues to action.

$H_{10}$ : Adaptive behavior is significantly affected by behavioral intention to follow COVID-19 preventive measures.

$H_{11}$ : Actual behavior is significantly affected by behavioral intention to follow COVID-19 preventive measures.

$H_{12}$ : Perceived effectiveness of COVID-19 preventive measures adopted in Indonesia is significantly affected by adaptive behavior.

$H_{13}$ : Perceived effectiveness of COVID-19 preventive measures adopted in Indonesia is significantly affected by actual behavior.

## METHODS

The research is categorized in correlational study. The research applies purposive sampling method. Purposive sampling is a nonprobability sampling technique with particular characteristics in selecting a sample from the population (Etikan, Musa, & Alkassim, 2016). The respondents are Indonesians whose ages are more than 17 years old when filling out the survey. There is a minimum age criterion for respondents because the age of 17 is considered to provide reliable answers. According to Hair, Hult, Ringle, and Sarstedt (2014), the sample size should be at least five times the number of indicators or items of the questionnaire. Hence, there are 483 respondents from the 16-days data collection process. They are spread across several regions in Indonesia, including Java, Sumatra, Kalimantan, Sulawesi, East Nusa Tenggara, and Bali.

Table 3 Research Questionnaire

| Construct | Item | Measures | Reference |
|-----------|------|----------|-----------|
| Personal Attitude | PA1 | I have been stressed during the COVID-19 pandemic | |
| | PA2 | I have been worried during the COVID-19 pandemic | |
| | PA3 | I have felt severe about people who are close to me during the COVID-19 pandemic | |
| | PA4 | I have felt severe seeing people who do not wear a mask during the COVID-19 pandemic | Prasetyo et al. (2020) |
| Subjective Norm | SN1 | Most of the people I know clean hands with hand sanitizer | |
| | SN2 | Most of the people I know engage in social distancing measures | |
| Perceived Behavioral Control | PBC1 | I think it is easy to implement the prevention protocol | |
| | PBC2 | I am pretty sure that I have enough knowledge about COVID-19 | |
| Perceived Susceptibility | Psus1 | I am well aware that I can be at risk of being infected with COVID-19 | |
| | Psus2 | I do not care about this disease and do my daily activities like before | |
| Perceived Severity | Psev1 | This disease has a high mortality rate | |
| | Psev2 | This disease is not very dangerous | Shahnazi et al. (2020) |
| | Psev3 | The transmission of this disease is high | |
| Perceived Barrier | Pbar1 | The mask is scarce in the market, so I do not wear a mask | |
| | Pbar2 | Staying at home to prevent the disease is difficult | |
| Perceived Self-Efficacy | Pseff1 | I have the ability to follow every preventive instruction against the disease | |
| | Pseff2 | I can do it if I want to take self-protective measures to prevent COVID-19 infection | Cui et al. (2017) |
| Perceived Benefits | Pben1 | This disease can be easily prevented by washing hands regularly with soap and water | |
| | Pben2 | This disease can be easily prevented by personal protective equipment, such as masks and disposable gloves | Shahnazi et al. (2020) |
| Cues to Action | CA1 | If a friend or family has been infected by COVID-19, it has a huge influence on you | |
| | CA2 | I know that I will feel bad if I do not follow the preventive instructions against the disease because somebody that cares about me does not want me to do it | Zavareh, Hezaveh, and Nordfjærn (2018) |
| Intention to Follow | IF1 | I am willing to follow the recommended precautions until the end of the COVID-19 outbreak | |
| | IF2 | I am willing to stay at home during COVID -19 outbreak | |
| | IF3 | I am willing to follow every rule made by my government during the COVID-19 outbreak | |
| | IF4 | I am willing to reschedule my travel plans | |
| | IF5 | I am willing to follow my government to lock down the country, city, and community. | |
| Actual Behavior | AcB1 | I am practicing proper handwashing to prevent the spread of the virus | |
| | AcB2 | I have used hand sanitizer more often during the COVID-19 outbreak | |
| | AcB3 | I always wash my hands whenever I go outside | |
| | AcB4 | The company/school where I work/study implements work/study from home to prevent the spread of COVID-19 | |
| | AcB5 | I always wear a face mask whenever I go outside during the COVID-19 outbreak | Prasetyo et al. (2020) |
| Adaptive Behavior | AdB1 | I always dispose of my face mask properly | |
| | AdB2 | I maintain a healthy lifestyle during the COVID-19 outbreak | |
| | AdB3 | I keep working from home during the COVID-19 outbreak | |
| | AdB4 | I do not smoke during the COVID-19 outbreak | |
| Perceived Effectiveness | PE1 | I think the preventive protocols for the COVID-19 outbreak in my community are informative | |
| | PE2 | I think a healthy lifestyle will enhance my immunity | |
| | PE3 | I think social distancing can prevent the transmission of COVID-19 | |
| | PE4 | I think a face mask can prevent the transmission of COVID-19 | |
| | PE5 | I think proper hygiene can prevent the transmission of COVID-19. | |

The survey is used as a data collection technique by distributing questionnaires online. Questionnaires were distributed from January 1 to 16, 2021. A literature study is also conducted by obtaining several related papers and 68 statement items from the HBM and TPB constructs. The statement on the questionnaire has been carried out by the back translation process first (Gunawan, Nugraha, Sulastiana, & Harding, 2019).

The pilot research is conducted with a survey of 61 respondents as a preliminary study to see the validity and reliability of the items on the questionnaire. The research checks the validity and reliability of the data using the IBM SPSS 20 by looking at Cronbach's alpha value. The pilot research obtains 40 items that will be used in the questionnaire, as seen in Table 3.

In the questionnaire, the respondents are asked to select statements that match their beliefs or experiences, using a 5-point Likert scale. The choices are strongly agree, agree, doubt, disagree, and strongly disagree. The statement on the questionnaire consists of several parts, namely participants' demography, attitude, subjective norm, perceived behavioral control, perceived susceptibility, perceived severity, perceived barrier, perceived self-efficacy, perceived benefit, cues to action, intention to follow, actual behavior, adaptive behavior, and perceived effectiveness. Moreover, there are several preliminary questions regarding demographic information, consisting of gender, age, education, occupation, income, ownership of health insurance, and domicile.

Data are analyzed using Partial Least Square-Structural Equation Modeling (PLS-SEM) with the SMART-PLS 3.29 software. PLS-SEM is used to see the relationship between variables. In the PLS-SEM method, an evaluation of the outer model is carried out through convergent validity with the loading factor value, construct reliability, and Average Variance Extracted (AVE) and discriminant validity from the cross-loading value. The loading factor value is said to be ideal if it is greater than 0,7. It means that the indicator is considered valid for the construct. Meanwhile, if the loading factor value is greater than 0,5, it is considered acceptable. Moreover, the limit value of the construct reliability test is accepted if it is above 0,7. For the AVE value, the greater the AVE value is, the greater the diversity of indicators can be contained in the latent construct, and the greater the indicator representation is in the construct (Hair *et al.*, 2014).

## RESULTS AND DISCUSSIONS

The research aims to see the effect of HBM and TPB on the perceived effectiveness of COVID-19 prevention measures in Indonesian society. The total number of respondents is 483 Indonesians. The survey is conducted 80% on the island of Java and 20% outside Java by using a purposive sampling method with the criteria of the respondent being more than 17 years old. Table 4 shows the respondents' demographic data.

Table 4 Demographic Data of the Respondents

| Characteristics | Category | N | % |
|---|---|---|---|
| Gender | Male | 219 | 45 |
| | Female | 264 | 55 |
| Age | 15-24 | 299 | 62 |
| | 25-34 | 110 | 23 |
| | 35-44 | 66 | 14 |
| | 45-54 | 8 | 1 |
| | >55 | 0 | 0 |
| Educational Background | Primary School | 2 | 0 |
| | Elementary School | 21 | 4 |
| | High School | 119 | 25 |
| | Vocational School | 30 | 6 |
| | Master Graduate | 265 | 55 |
| | Ph.D. Graduate | 46 | 10 |
| Monthly Salary (in Million IDR) | Uncategorized | 26 | 5 |
| | < 2,5 | 281 | 58 |
| | 2,5–5 | 102 | 21 |
| | 5–7,5 | 33 | 7 |
| | 7,5–10 | 22 | 5 |
| | > 10 | 19 | 4 |
| Health Insurance | No | 55 | 11 |
| | Yes | 428 | 89 |

PLS-SEM is used as a method based on Orji, Vassileva, and Mandryk (2012), who discussed whether the extended HBM model could predict the original HBM model. The research consists of 13 latent or construct variables. The loading factor value of each indicator is in the range between 0,571 to 0,938. Therefore, the latent variables of the TPB and HBM models are measured by valid indicators because all indicators have a loading factor value of more than 0,5. Moreover, the construct reliability measures the internal consistency of the indicators for each construct. The research model has all construct reliability values above 0,7, except for perceived with the value of 0,405 and perceived susceptibility with the value of 0,089. The values may be due to imperfections in the data collection technique. However, because the measurement of this model is explanatory, the construct reliability value below 0,7 is still acceptable.

Table 5 The Results of Loading Factor, Construct Reliability, and AVE

| Construct(s) | Item(s) | Loading Factor | Construct Reliability | AVE |
|---|---|---|---|---|
| Personal Attitude | PA1 | 0,571 | 0,840 | 0,573 |
| | PA2 | 0,751 | | |
| | PA3 | 0,812 | | |
| | PA4 | 0,862 | | |
| Subjective Norm | SN1 | 0,913 | 0,868 | 0,767 |
| | SN2 | 0,837 | | |
| Perceived Behavior Control | PBC1 | 0,777 | 0,802 | 0,670 |
| | PBC2 | 0,857 | | |
| Perceived Susceptibility | Psus1 | 0,888 | 0,089 | 0,574 |
| | Psus2 | -0,600 | | |
| Perceived Severity | Psev1 | -0,798 | 0,405 | 0,658 |
| | Psev2 | 0,850 | | |
| | Psev3 | 0,784 | | |
| Perceived Barrier | Pbar1 | 0,806 | 0,772 | 0,629 |
| | Pbar2 | 0,780 | | |
| Perceived Benefit | Pben1 | 0,742 | 0,800 | 0,668 |
| | Pben2 | 0,887 | | |
| Perceived Self-Efficacy | Pseff1 | 0,834 | 0,870 | 0,770 |
| | Pseff2 | 0,919 | | |
| Cues to Action | CA1 | 0,594 | 0,754 | 0,616 |
| | CA2 | 0,938 | | |
| Intention to Follow | IF1 | 0,808 | 0,891 | 0,623 |
| | IF2 | 0,679 | | |
| | IF3 | 0,863 | | |
| | IF4 | 0,741 | | |
| | IF5 | 0,843 | | |
| Adaptive Behavior | AdB1 | 0,421 | 0,757 | 0,452 |
| | AdB2 | 0,582 | | |
| | AdB3 | 0,794 | | |
| | AdB4 | 0,813 | | |
| Actual Behavior | AcB1 | 0,797 | 0,892 | 0,624 |
| | AcB2 | 0,795 | | |
| | AcB3 | 0,779 | | |
| | AcB4 | 0,842 | | |
| | AcB5 | 0,735 | | |
| Perceived Effectiveness | PE1 | 0,744 | 0,903 | 0,656 |
| | PE2 | 0,865 | | |
| | PE3 | 0,916 | | |
| | PE4 | 0,883 | | |
| | PE5 | 0,599 | | |

Based on the results of data processing using PLS-SEM, it is found that all HBM constructs have an AVE value of more than 0,5, except for adaptive behavior with the value of 0,452. It means that the latent variable can explain an average of more than half the variance of the indicators. The construct with the smallest AVE value is adaptive behavior, and the construct with the largest AVE value is perceived self-efficacy (0,770). Thus, it can be said that this research model has good convergent validity. Table 5 shows the loading factor, construct reliability, and AVE for each construct.

Then, PLS-SEM using SMART-PLS software is used to see the relationship between variables. PLS-SEM results can be seen in Figure 2. In TPB, it shows that subjective norm (p < 0,01) and perceived behavior control (p < 0,01) significantly and directly affect an individual's behavioral intention to follow the COVID-19 preventive measures. Meanwhile, personal attitude (p > 0,05) does not significantly and directly influence an individual's behavioral intention to follow the COVID-19 preventive measures. Moreover, in HBM, it shows that perceived severity (p < 0,01), perceived barrier (p < 0,01), perceived self-efficacy (p < 0,01), and cues to action (p < 0,01) have a significant and direct effect on an individual's behavioral intention to follow the COVID-19 preventive measures. Meanwhile, perceived susceptibility (p > 0,05) and perceived benefit (p > 0,05) do not significantly and

directly affect an individual's behavioral intention to follow the COVID-19 preventive measures. Then, intention to follow significantly and directly impact the actual behavior of individuals (p < 0,01) and the adaptive behavior of individuals (p < 0,01). Besides that, actual behavior (p < 0,01) and adaptive behavior (p < 0,01) have a significant and direct impact on the perceived effectiveness of COVID-19 preventive measures implemented in Indonesia.

Table 6 shows the direct effect, indirect effect, and total effect for each variable. The p-value which is less than 0,05 indicates the significant correlation. According to the results shown in Table 6, the intention to follow is significantly predicted by subjective norm (p < 0,01) and perceived behavior control (p < 0,01). Indonesians who have greater self-control tend to comply with health protocols, such as staying at home and obeying lockdown orders. This result is in accordance with the research of Prasetyo et al. (2020) and Seale et al. (2020). Intention to follow has implications for someone who follows a healthy lifestyle. They will tend to wash their hands, wear masks, and avoid activities that affect their immunity during the COVID-19 outbreak. Then, the subjective norm is normative appreciation, values, and the desire to obey a certain action. It is mainly expressed by observing the behavior of others. From the results obtained, someone who lives among people who
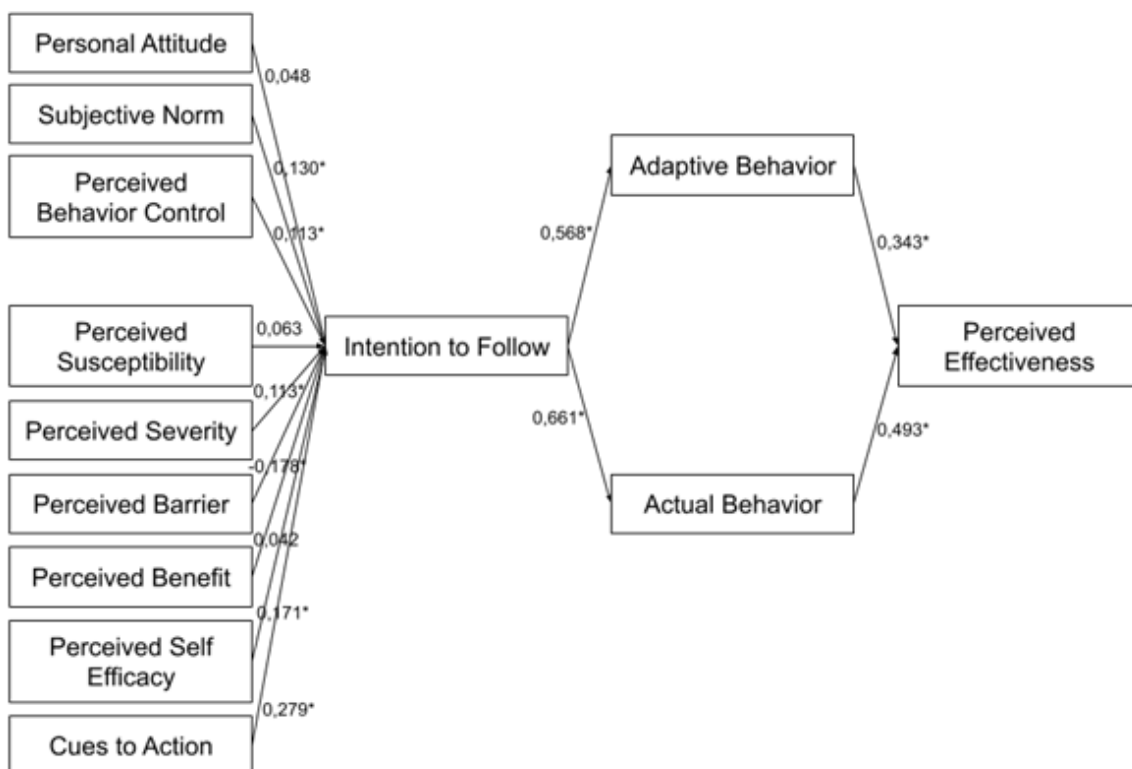


* indicates the significant correlation between two variables (p < 0,05)

Figure 2 Modelling of SEM

Table 6 The Direct Effect, Indirect Effect, and Total Effect

| Variable(s) | Direct effect | P-value | Indirect effect | P-value | Total effect | P-value |
|---|---|---|---|---|---|---|
| PA → IF | 0,048 | 0,255 | | | 0,048 | 0,255 |
| PA → AdB | | | 0,028 | 0,264 | 0,028 | 0,264 |
| PA → AcB | | | 0,032 | 0,260 | 0,032 | 0,260 |
| PA → PE | | | 0,025 | 0,262 | 0,025 | 0,262 |
| SN → IF | 0,130 | 0,001 | | | 0,130 | 0,001 |
| SN → AdB | | | 0,074 | 0,002 | 0,074 | 0,002 |
| SN → AcB | | | 0,086 | 0,002 | 0,086 | 0,002 |
| SN → PE | | | 0,068 | 0,002 | 0,068 | 0,002 |
| PBC → IF | 0,113 | 0,009 | | | 0,113 | 0,009 |
| PBC → AdB | | | 0,064 | 0,012 | 0,064 | 0,012 |
| PBC → AcB | | | 0,075 | 0,009 | 0,075 | 0,009 |
| PBC → PE | | | 0,059 | 0,010 | 0,059 | 0,010 |
| Psus → IF | 0,063 | 0,119 | | | 0,063 | 0,119 |
| Psus → AdB | | | 0,036 | 0,121 | 0,036 | 0,121 |
| Psus → AcB | | | 0,042 | 0,123 | 0,042 | 0,123 |
| Psus → PE | | | 0,033 | 0,125 | 0,033 | 0,125 |
| Psev → IF | 0,118 | 0,007 | | | 0,118 | 0,007 |
| Psev → AdB | | | 0,067 | 0,008 | 0,067 | 0,008 |
| Psev → AcB | | | 0,078 | 0,008 | 0,078 | 0,008 |
| Psev → PE | | | 0,061 | 0,009 | 0,061 | 0,009 |
| Pbar → IF | -0,178 | 0,000 | | | -0,178 | 0,000 |
| Pbar → AdB | | | -0,101 | 0,000 | -0,101 | 0,000 |
| Pbar → AcB | | | -0,118 | 0,000 | -0,118 | 0,000 |
| Pbar → PE | | | -0,093 | 0,000 | -0,093 | 0,000 |
| Pben → IF | 0,042 | 0,262 | | | 0,042 | 0,262 |
| Pben → AdB | | | 0,024 | 0,257 | 0,024 | 0,257 |
| Pben → AcB | | | 0,028 | 0,267 | 0,028 | 0,267 |
| Pben → PE | | | 0,022 | 0,262 | 0,022 | 0,262 |
| Pseff → IF | 0,171 | 0,000 | | | 0,171 | 0,000 |
| Pseff → AdB | | | 0,097 | 0,000 | 0,097 | 0,000 |
| Pseff → AcB | | | 0,113 | 0,000 | 0,113 | 0,000 |
| Pseff → PE | | | 0,089 | 0,000 | 0,089 | 0,000 |
| CA → IF | 0,279 | 0,000 | | | 0,279 | 0,000 |
| CA → AdB | | | 0,158 | 0,000 | 0,158 | 0,000 |
| CA → AcB | | | 0,184 | 0,000 | 0,184 | 0,000 |
| CA → PE | | | 0,145 | 0,000 | 0,145 | 0,000 |
| IF → AdB | 0,568 | 0,000 | | | 0,568 | 0,000 |
| IF → AcB | 0,661 | 0,000 | | | 0,661 | 0,000 |
| IF → PE | | | 0,521 | 0,000 | 0,521 | 0,000 |
| AdB → PE | 0,343 | 0,000 | | | 0,343 | 0,000 |
| AcB → PE | 0,493 | 0,000 | | | 0,493 | 0,000 |

care deeply about health protocols is likely to follow precautionary orders during a pandemic. This finding is in accordance with the research of Prasetyo *et al.* (2020) and Chan *et al.* (2005). In addition, indirectly, subjective norm and perceived behavior control affect perceived effectiveness.

On the contrary, personal attitude does not affect the intention to follow. The increasing personal attitude (anxiety) towards the spread of the COVID-19 pandemic is not strong enough to change the intention to follow. This result is in contrast to the research of Prasetyo *et al.* (2020). Attitude towards behavior refers to the perceptions of individuals who carry out certain behaviors. For example, someone has anxiety during the outbreak of the COVID-19 pandemic. However, based on further interviews, Indonesians tend to feel anxious not because of the outbreak of COVID-19. There is a possibility of decreased income due to large-scale restriction policies that people cannot work even though working is one of the activities to survive (Norberg & Rucker, 2020). In addition, from the results of subjective norms, it is known that the role of society largely determines the preventive behavior of an individual. So, it can be concluded that Indonesians tend to imitate the behavior of others compared to self-perceptions when it is related to preventing the spread of COVID-19.

PLS-SEM test is also conducted to measure the relationship between HBM model variables and intention to follow (the behavior to prevent the spread of COVID-19), such as following health protocols and complying with government regulations and isolation policies. Based on the test results, it is known that four variables have a significant relationship with intention to follow. Those variables are perceived severity, perceived barrier, perceived self-efficacy, and cues to action. It means that the four variables can predict or influence a person's motivation and intention in carrying out COVID-19 prevention behavior. The results are in accordance with the research of Shahnazi *et al.* (2020) and Li *et al.* (2020a). Perceived severity is an important variable that predicts COVID-19 prevention behavior. It raises negative emotions, such as perceptions of mortality rates and risk of transmission, affecting a person's psychological response and encouraging the prevention of transmission of COVID-19 (Li *et al.*, 2020a). Moreover, it has a significant and indirect relationship to adaptive behavior, actual behavior, and perceived effectiveness. The greater the fear is experienced, the more it will motivate people to protect themselves. Then, it leads to adaptive behavior (Milne, Sheeran, & Orbell, 2000).

The perceived barrier is defined as a person's perception of obstacles in preventing the transmission of COVID-19 (Shahnazi *et al.*, 2020). The relationship between the perceived barrier and intention to follow is significant and opposite. This result is in accordance with the research of Shahnazi *et al.* (2020). The more difficulties are faced, such as difficulty in washing hands, using masks, and getting hand sanitizers, the more people tend not to have the motivation to take steps in preventing COVID-19 transmission. Therefore, COVID-19 prevention behavior can be improved by reducing the perceived barrier (Shahnazi *et al.*, 2020). In the research, 40,98% of respondents find it difficult to stay at home. This situation may be due to work obligations, urgent matters, boredom, and others (Norberg & Rucker, 2020).

Perceived self-efficacy also has a significant relationship to intention to follow. If people feel confident that they can carry out the health protocol, it is not difficult to run the program. The relationship between perceived self-efficacy and intention to follow is in line with the research of Tarkang and Zotor (2015). Perceived self-efficacy affects human behavior through processes of motivation, cognition, and affection. The higher the level of self-efficacy is, the more it encourages people to have higher targets and makes them more persistent in achieving these goals (Razak, Marmaya, Karim, Wee, & Ridzuan, 2018). In this case, high self-efficacy leads to better prevention behavior for COVID-19 transmission.

The variable with the greatest significance value is the cues to action. This result is in accordance with the research of Tarkang and Zotor (2015). Cues to action can predict intention to follow because more obtained information from trusted sources and experience and support from the surrounding environment raises motivation for someone to take action and strive to overcome the difficulties. Moreover, guidance or information obtained from the mass media and experience and support from the closest person can motivate a person to implement health protocols. Then, cues to action have a significant and indirect relationship to adaptive behavior, actual behavior, and perceived effectiveness.

However, among the HBM models, there are several insignificant variables, such as perceived susceptibility and perceived benefit. According to Shahnazi *et al.* (2020), perceived susceptibility is not significant for preventive behavior. Perceived susceptibility is defined as an individual's perception of personal vulnerability. Apart from perceived susceptibility, another insignificant variable is perceived benefit. Perceived benefit is an individual's perception of the benefits of the preventive action. The results are inconsistent with Shahnazi *et al.* (2020). Based on the results of data processing, the level of vulnerability (perceived susceptibility) and perceived benefits of action (perceived benefit) do not affect COVID-19 prevention behavior. The development of information through the mass media and advances in science regarding the cure for COVID-19 has changed the public's risk perception of COVID-19. So, they tend to ignore and feel safe. In addition, it can also be caused by economic demands that require people to continue working even though they have a high level of vulnerability (Norberg & Rucker, 2020).

From the results, the intention to follow predicts adaptive behavior (p < 0,01) and actual behavior (p < 0,01) directly. It shows that people's willingness to follow leads to healthy behavior towards the

recommended preventive measures. The results are in accordance with the research of Prasetyo *et al*. (2020) and Mahardika, Thomas, Ewing, and Japutra (2020). In addition, the intention to follow predicts perceived effectiveness ($p < 0,01$) indirectly. It implies that if Indonesians are willing to follow health protocols, it will result in their perception that complying with health protocols effectively prevents the transmission of COVID-19.

Furthermore, the results also indicate that adaptive behavior significantly predicts the perceived effectiveness ($p < 0,01$). It suggests that people's healthy lifestyles will help to achieve perceived effectiveness by increasing their immunity to prevent virus transmission. The results also suggest that a healthy lifestyle, social distancing, face masks, proper hygiene, and lockdowns will increase the perceived effectiveness of COVID-19 prevention measures. The results are in accordance with the research of Prasetyo *et al.* (2020). On the other hand, actual behavior significantly predicts perceived effectiveness ($p < 0,01$). It implies that washing hands properly using a hand sanitizer and doing social distance will increase perceived effectiveness. Policymakers must apply this to create awareness and prevent panic in the community (Balkhy, Abolfotouh, Al-Hathlool, & Al-Jumah, 2010).

The Indonesian government has implemented social distancing measures for the community and provided health protocol principles like using masks, washing hands or using hand sanitizers, keeping distance or avoiding crowds, increasing immunity, consuming balanced nutrition, managing comorbid diseases, and paying attention to vulnerable groups and clean and healthy lifestyle. In addition, there has been a decision by the President of Indonesia regarding a task force for the rapid response to COVID-19 at the end of March 2020. The Indonesian task force for COVID-19 (COVID-19 Response Acceleration Task Force) issues guidelines for rapid medical response and health aspects of handling COVID-19 in Indonesia. This guide targets medical personnel and the general public to inform how to reduce impacts and mortality rates.

Moreover, the government's recent policy is large-scale social restrictions (Pembatasan Sosial Berskala Besar (PSBB)). PSBB is stated in Government Regulation No. 21 of 2020 concerning PSBB in the context of accelerating the handling of COVID-19. Several activities are limited during the PSBB, including school and workplace activities, religious activities, activities in public facilities, social and cultural activities, and public transportation operations (Ministry of Health, 2020).

Based on the research results, steps, which the government can take, include minimizing the potential for barriers that can hinder individuals from preventing COVID-19, such as ensuring the fulfillment of Personal Protective Equipment (PPE) needs, masks, and hand sanitizers. Education to the public needs to be carried out intensively and thoroughly using easy-to-understand language to build awareness of a healthy lifestyle, treatment, medication, and information about the current condition of COVID-19. In addition, economic demands are a major factor that causes people to find it difficult to take preventive measures, such as staying at home, social distancing, and others. Therefore, the government can provide skills and capital to people who are economically affected. In addition, seeing the insignificant results of personal attitude, the government and other stakeholders should focus more on educating the community, not the individual level, about COVID-19 like preventive measures. For example, educating the community can not only be done through social media, which people usually access. It can be conducted by going down to the community directly but still paying attention to health protocols.

In addition, from the things mentioned to prevent the transmission of COVID-19, currently, the world, including Indonesia, has developed a COVID-19 vaccine. The COVID-19 vaccine in Indonesia has begun to be distributed to state officials, health workers, the elderly, educators, and others. Although the research does not measure the intention to receive the vaccine, several related factors can be considered to see the factors that influence the acceptance of the COVID-19 vaccine, like the subjective norm that influences a person's intention to comply with a protocol, including vaccine orders. The results show that someone who lives among people who pay close attention to health protocols tends to follow orders. Those orders are also included in the order to receive the COVID-19 vaccine. In addition, for the perceived behavior control, someone who has greater self-control tends to carry out orders in the application of vaccines. Therefore, these factors can be considered by the government to deliver the importance of the COVID-19 vaccine.

## CONCLUSIONS

The research integrates the TPB and the HBM to evaluate the factors that influence the effectiveness of preventing the transmission of the COVID-19 in Indonesia. Around 483 respondents answer the online survey containing 40 questions. The PLS-SEM results indicate that in TPB, subjective norm and perceived behavior control have a significant and direct effect on an individual's behavioral intention to follow the preventive measures of COVID-19. In addition, for HBM, perceived severity, perceived barrier, perceived self-efficacy, and cues to action have a significant and direct influence on an individual's behavioral intention to follow the preventive measures of COVID-19. Moreover, intention to follow, adaptive and actual behavior impact the perceived effectiveness of COVID-19 preventive measures implemented in Indonesia significantly and directly.

The research can be one of the early studies in analyzing the factors that affect the effectiveness of preventing the transmission of the COVID-19. The

findings can be used to evaluate the effectiveness in several countries in facing the COVID-19 pandemic. Factors that have been shown to affect preventive behavior can be considered in determining COVID-19 prevention strategies. The factors with significant effect are subjective norms, perceived barrier, perceived self-efficacy, and cues to action.

The research results show a positive contribution to the Indonesian government's policies in preventing the transmission of COVID-19. Factors that influence preventive behavior against COVID-19 can be used to formulate effective policies and strategies. For example, it can include ensuring PPE availability, implementing appropriate community education methods, and overcoming other problems, such as economic needs, employment opportunities, and others.

There are three limitations in the research. First, the research is conducted using a cross-sectional method. Thus, it cannot see the causal relationship that occurs to the respondent and cannot know the effect of an intervention given to the respondents. Second, data collection is carried out using a questionnaire, so it allows respondents' subjectivity. Third, the involved respondents are directed at specific groups, such as students. Therefore, further research can be carried out by comparing responses to COVID-19 prevention based on profession or other demographic data.

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