The Influence of COVID-19 Protocol and Public Compliance on Environmental Sanitation

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Abstract: The purpose of this study was to investigate the effect of the COVID-19 protocol and public compliance to the protocol towards environmental sanitation. "Sanitation" here refers to clean water, toilets, wastewater disposal facilities and waste management facilities. The research method used is quantitative with survey explanation format. The population of this research is people living in Depok, West Java. The sampling technique used in this study was simple random sampling. 250 residents were chosen as the research sample. The data was then analysed using Smart PLS Professional version 3.2.4. The results showed that there is a positive and significant effect of COVID-19 protocol and community compliance on environmental sanitation.

Keywords: health protocol, compliance, COVID-19, sanitation, environment

1. Introduction

Basic sanitation is the minimum requirement that must be possessed by every family to live a healthy life. The scope of "sanitation" includes clean water facilities, toilets, wastewater disposal facilities, and waste management facilities. Basic sanitation can help prevent environmental-based diseases. However, people in various regions, including Indonesia, still face many obstacles to provide such facilities for their families. As a result, environmental-based diseases are spreading rampantly. One of those environmental-based diseases is COVID-19.

Corona virus, the virus that causes COVID-19, belongs to the beta corona virus genus. Phylogenetic results show that this virus is included in the same subgenus as the virus that caused the Severe Acute Respiratory Illness (SARS) outbreak in 2002-2004, Sarbecovirus [1]. COVID-19 virus is an RNA virus with a particle size of 120-160 nm. Aside from humans, the virus also infects animals, including bats and camels. The case of the COVID-19 pandemic that has infected humans is believed to have originated from pangolins.

COVID-19 is a newly discovered disease, and information regarding its prevention is still limited. The key to prevention includes breaking the chain of transmission with isolation, early detection, and providing basic protection [2]. This information has to be given to the community, including those who live in Villa Nusa Indah, Bojongkulur Village, Gunungputri District, Bogor Indonesia.

Public compliance towards COVID-19 protocol is urgently needed in breaking the chain of the spread of the COVID-19 virus. Compliance is defined as an attitude of discipline or behavior to obey a set order or rule, with full awareness. Compliance as a positive behavior was considered as an option. It means that individuals have the choice to do, obey, respond critically to rules, laws, social norms, requests, or wishes from someone who holds an important role or authority [3].

This research aims to investigate the influence of COVID-19 protocol and public compliance towards the protocol on environmental sanitation. The researcher feels that it is urgent to investigate this problem to help provide information regarding this matter.

Environmental sanitation is the health status of an environment, including housing, sewage disposal, clean water supply, and others [4]. WHO stated that environmental sanitation is an effort to control all physical environment factors that may affect physical development, health, and human well-being [5]. Meanwhile, environmental sanitation is the monitoring of the physical, biological, social, and economic environment that affects human health, with the beneficial factors maintained and increased, while detrimental factors eliminated [6].

Environmental sanitation behavior is individuals' and groups' behavior to prevent diseases through environmental management. Environmental sanitation behavior is an activity aimed at improving and maintaining the basic environmental conditions that affect human welfare, including (1)clean and safe water supply; (2)disposal of waste from animals, humans and industry; (3)protection of food from biological and chemical contamination; (4) clean and safe air (5) clean and safe house [7].

Sanitation behavior is driven by the hierarchical influence of traditional leaders, action of groups, and children's opinions. Taboos, including prohibiting different generations of family members, in-laws, and different sexes from using the same toilet, are obstacles to establishing environmental sanitation behavior [8]. Environmental sanitation behavior mainly comes from individual personalities through training and practices supported by law and initiated by the government [9].

The massive growth of COVID-19 cases in Indonesia is exacerbated by the rampant spread of the virus, both from animals to humans and between humans. Transmission from animals to humans is mainly caused by the consumption of infected animals, especially bats. Meanwhile, close contact with a patient infected with COVID-19 will increase the risks of transmission between humans.

Transmission between humans is mainly caused by the release of droplets containing the virus through coughing or sneezing. The droplets in the air can then be inhaled by other humans nearby through the nose or mouth. The virus will then enter the lung and cause infection [10].

Clinically, the COVID-19 infection may cause no symptoms at all, while it also may lead to very severe pneumonia, respiratory distress, septic shock, and multi-organ failure [11]. To stop the spread of COVID-19, various preventive actions must be implemented, both by the government and the public.

So far, preventive efforts are the best practice to reduce the spread of COVID-19. At present, no vaccine is proven 100% effective to fight the virus, meaning that the best we can do to prevent COVID-19 is to take preventive measures, including implementing health protocol. Some of the currently implemented protocol including the rule to wear mask when going to public places; covering the mouth and nose when sneezing or coughing; washing hands with soap or hand sanitizer containing at least 60% alcohol; avoiding contact with infected people; social distancing; and refrain from touching eyes, nose, and mouth with unwashed hands [12].

Compliance is a disciplined attitude or behavior to obey a set order or rules with full awareness. Compliance as a positive behavior was assessed as an option. Compliance as a positive behavior was considered as an option. It means that individuals have the choice to do, obey, respond critically to rules, laws, social norms, requests, or wishes from someone who holds an important role or authority. Feldman (in Rahmawati, 2015) stated that compliance is 'change in behavior in response to the command of others'. Compliance can occur in any form, as long as the individual shows obedience towards something or someone.

Research Method

The research was conducted from July to September 2020 in Villa Nusa Indah, Bojongkulur Village, Gunungputri District, Bogor Indonesia. The research method used was quantitative with survey explanation format. The sampling technique used in this study was simple random sampling, with 250 residents of Villa Nusa Indah, Bojongkulur Village, Gunungputri District chosen as research samples. Data analysis was carried out using Smart PLS Professional version 3.2.4.
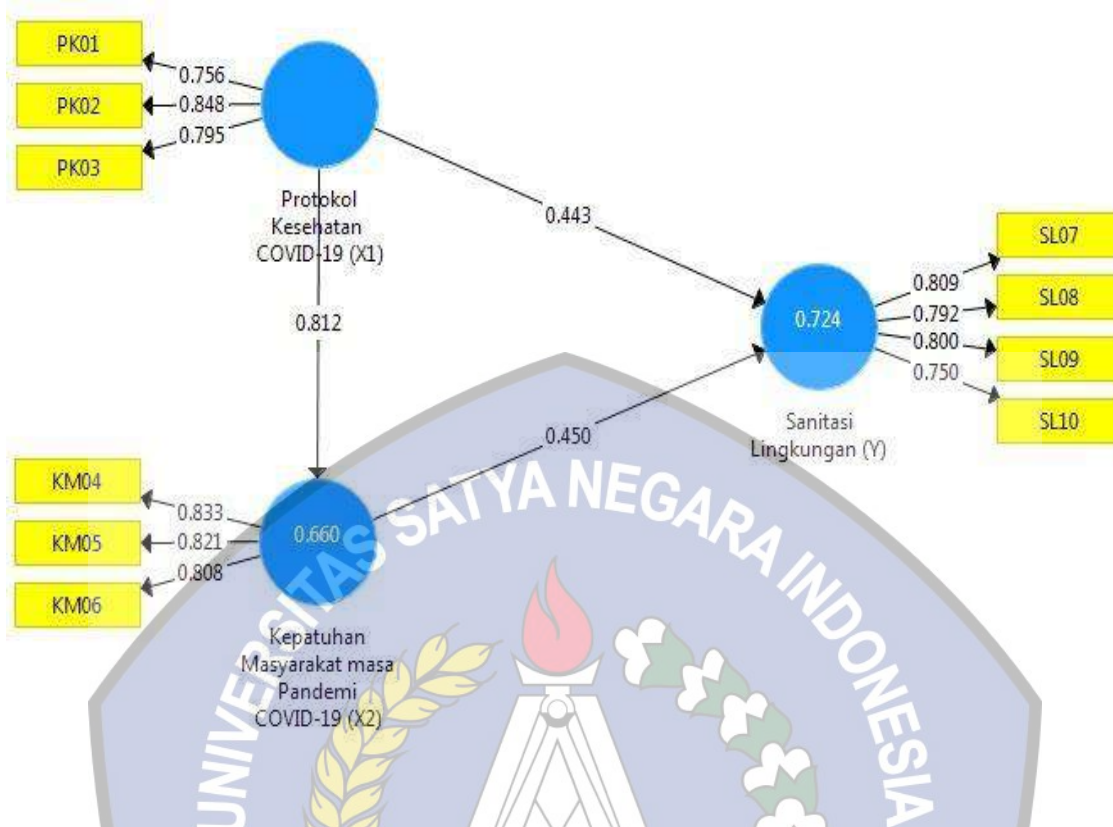
2. Research Results

Figure 1. Outer models

Outer loadings value indicates the correlation between the indicator and its construct. A low outer loadings value means that the indicator has no effect on the model. This study uses standard outer loading of 0.7. The results show that the outer loadings values of all indicators are above 0.7.

The Average Variance Extracted (AVE) value is used to measure the variance captured by the construct compared to the variance caused by the measurement error. AVE value must be above 0.5. The results show the value of Average Variance Extracted (AVE)> 0.621

Discriminant validity from the reflexive measurement model can be calculated using the Fornell Larcker criterion value and the cross-loadings value of the manifest variable against each latent variable. The Fornell Larcker criterion value must be higher than the AVE value of each latent variable, indicating a low degree of mismatch not measured by the measuring instrument and low discriminant validity. The results of the calculation show that the latent variable correlation value between the COVID-19 protocols (X1) is 0.801, higher than the AVE value of 0.641. Public compliance (X2) also has a higher correlation value (0.820) than its AVE value (0.673), as well as the environmental sanitation (Y) (0.788 > 0.621).

The reliability test consists of composite reliability and Cronbach's Alpha. Composite reliability is the test to measure the reliability value of indicators on a variable. A variable can be considered as passing this rest if the value is above 0.7. The results indicate that each variable has fulfilled this condition.

The coefficient of determination (R-squared) is used to measure how much endogenous variables are affected by other variables. R-square value of 0.67 and above indicates that the influence of exogenous variables (the influencer) on the endogenous variables is 'good'. 0.33 - 0.67 indicates medium influence, and 0.19 - 0.33 indicates weak influence [13].

The R-square value for the Environmental Leadership (X2) variable of 0.660 indicates medium influence. The value explains that public compliance (X2) is influenced by the COVID-19 protocol (X1) by 66%. The remaining 34% is the influence of other variables such as a clean and healthy lifestyle (PHBS), motivation, local wisdom, etc. The R-square value for the Environmental sanitation (Y) variable of 0.724 indicates 'good' influence. The value explains that environmental sanitation (Y) is influenced by the COVID-19 protocol (X1) by 72.4%. The remaining 27.6% is the influence of other variables such as a clean and healthy lifestyle (PHBS), motivation, local wisdom, etc.

The hypotheses are tested using T-statistics and P-values. The hypotheses can be accepted if the P-Values are below 0.05 [14].

Table 1 T-Statistic and P Values.

Latent Variables	T-Statistic	P Values
COVID-19 Protocol (X$_1$) on Environmental Sanitation (Y)	7.652	0,000
COVID-19 Protocol (X$_1$) on Public Compliance (X$_2$)	30.951	0,000
Public Compliance (X$_2$) on Environmental Sanitation (Y)	7.187	0,000

Table 1 shows that the influence of the COVID-19 protocol on environmental sanitation has a T-statistic value of 7.652, above its T-table value of 1.969 (α = 0.05) and a P-value of 0.000 < α = 0.05. It means that there is a positive and significant effect of the COVID-19 protocol on environmental sanitation. The influence of the COVID-19 protocol on public compliance has a T-statistic value of 30,95, above its T-table value of 1.969 (α = 0.05) and a P-value of 0,000 < α = 0.05. It means that there is a positive and significant effect of the COVID-19 protocol on public compliance. The influence of public compliance on environmental sanitation has a T-statistic value of 7.187 above its T-table value of 1.969 (α = 0.05) and a P-value of 0.000 < α = 0.05. It means that there is a positive and significant effect of public compliance on environmental sanitation.

The PLS model was evaluated by looking at the predictive relevance (Q-square) for the constructive model. Q-square aims to measure how well the observed value is generated by the model and also its parameter estimates. The measurement criteria are sure, if the calculation results show the Q-square value is more than 0 (zero), then the model deserves to be said to have a relevant predictive value. Meanwhile, if the Q-square value is less than 0 (zero) it shows that the model lacks predictive relevance. The results of the predictive relevance (Q-square) calculation are as follows:

Table 2 Predictive Relevance

Variabel Laten	Q Square
Public Compliance (X$_2$)	0.414
Environmental Sanitation (Y)	0.420

Table 2 shows that the Q-square value of Community Compliance during the COVID-19 Pandemic (X2) is 0.414; and the Q-square value of Environmental Sanitation (Y) of 0.420. The results of the calculation show that the Q-square value is more than 0 (zero), so the model deserves to be said to have a good observation value or the model deserves to be said to have a relevant predictive value.

The model goodness test (Model Fit) uses the Normed Fit Index (NFI), which is a measure of the suitability of the model on a comparative basis to the base line or the null model. The null model is generally a model which states that the variables contained in the estimated model are not interrelated.

Table 3 Model Fit.

Model Fit	Nomed Fix Index (NFI)
Saturated Model	0.713

Based on the results of the above calculations, the Nomed Fix Index (NFI) value on the Saturated Model is 0.713. Thus the research model studied was 71.3% in the fit or good category.

3. Results

The research findings show positive and significant relationship between COVID-19 protocol, environmental sanitation, and public compliance. This result matches the results of Yuningsih's research, which shows efforts to increase readiness in facing 'new normal' by optimizing health promotion. During a crisis of public confidence, the role of all elements of society is very important in promoting discipline [15].

The result also matches Sari, Sholihah, and Atiqoh's research, which aims to determine the relationship between public knowledge and compliance with the use of masks as an effort to prevent COVID-19 in Ngronggah. The results show that there is a relationship between public knowledge and compliance with the use of masks as an effort to prevent COVID-19 in Ngronggah [16].

Lastly, the result also matches that proved that adequate knowledge of the COVID-19 pandemic and a clean and healthy lifestyle is important to reduce COVID-19 spread [17].

4. Conclusion

The conclusions of this research are:
a. The COVID-19 protocol has a positive and significant effect on environmental sanitation.
b. The COVID-19 protocol has a positive and significant effect on public compliance.
c. Public compliance has a positive and significant effect on environmental sanitation.
Based on the findings, this study concludes that understanding of environmental sanitation can be improved by promoting COVID-19 protocol and public compliance.

5. Acknowledgement

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