Applying Milgram's Theory and Health Belief Model in Understanding Compliance to Health Protocols of Covid-19 Pandemic

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ABSTRACT

COVID19 pandemic has significantly changed the world and human's normal life into a new normal life. World Health Organization had recommended early in the pandemic for the people to wear a face mask, keep a distance at a minimum of 1 meter between individuals and practice frequent handwashing with soap. Compliance with health protocols in the COVID-19 pandemic may be influenced by external factors and internal factors i.e., individual perception, knowledge, attitude, beliefs and intentions. This study aimed to compare Milgram's compliance theory and HBM concerning the community's compliance to the health protocols of COVID-19 prevention. An online survey for a cross-sectional study had been conducted among the community in East Java province in 2020 which had obtained a total of 350 respondents. The results showed some internal factors in Milgram Theory such as region status, personal responsibility, support between communities, and relationship of heads of villages with the community had significantly influenced compliance to health protocols. Meanwhile, internal factors in HBM Theory which include perceived benefits, perceived barriers, self-efficacy, and cues to action had also a significant influence on the community's compliance with health protocols. The internal factors in HBM Theory were more influential on the community's compliance compared to the external factors in Milgram Theory. Based on this, the government and other related parties who are responsible for improving community awareness and understanding on the need to comply with health protocols could apply the internal factors as stipulated in the HBM. The community awareness on the internal factors could also be a success factor in declining the case fatality rate (CFR) from Covid 19 infection.

INTRODUCTION

In December 2019, the city of Wuhan, China was the focus of global attention due to an out break of a respiratory disease by the coronavirus 2019-n CoVor Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2). The infection named as Covid 19 had become a pandemic when it continued to spread in the United State of America, Europe and South America, and Asia Pacific countries. As with other outbreaks in the past such the Mers CoV and SARs, various efforts to control the outbreak such as stringent quarantine procedures and surveillance had been put in place while some countries had taken extreme non pharmaceutical measures by directed lockdowns on most sectors to curb the pandemic(Hale et al., 2021). Governments in many countries haverequired citizens to practice health

protocol (such as wearing masks and washing hands regularly) at high levels of compliance (Delgado et al., 2020). Evidence from literature showed that frequent handwashing before touching the nose will reduce the risk of viral infection by 69.7% % while face masks can filter the air flowing to the lungs through filtration and have an excellent effect on the epidemic of respiratory tract infection(Lio et al., 2021). Considering the vulnerability of the population to the COVID-19 infection, the health protocols which are carried out persistently have been proven to effectively block the viral infection (Chen et al., 2020).

The first case of Covid 19 reported in Indonesia was on the 1st of March, 2020 during which it started with only 2 people and by the end of the month, a total of 1,285 Indonesians were infected (Kementerian Kesehatan RI, 2020). In dealing with the pandemic, the Indonesian government refers to the WHO recommendations on the implementation ofvarious policies to deal with Covid 19. The Indonesia Government enforces policies such as the use of face masks, physical distancing, and washing hands with soap everywhere, similar to what had recommended by WHO. In addition, the government is also trying to accelerate the 3Ts (Testing, Tracing, Treatment) by empowering volunteers, health workers, and the general public as the key to efforts to prevent further spread of Covid-19 in Indonesia (Djalante et al., 2020).

Compliance with health protocols is required to limit the transmission of COVID-19 as proved by some researches (Afro, 2020). However, despite the various measures to curb the outbreak, compliance of the people towards the preventive measures is an issue. A survey conducted by the Central Statistics Agency (Badan Pusat Statistik) reported that 55% of their respondents did not comply to the health protocols because there was no laws applied, 39% said because there were no cases of Covid-19 that occurred nearby, 21% said because they followed other people, 33% did not like it because it held back their work and 19% because of lack ofgood examples from officials and authorities(Tim BPS Covid-19 Statistical Task Force, 2020)·(Noorrizki et al., 2021). The behavior of people who does not comply to the Covid 19 health protocols will hamper the efforts to end the pandemic.

Compliance to non-pharmaceutical preventive measures of COVID-19 transmission are influenced by external and internal factors as perceived by the individuals. Milgram defines compliance as one of the social behaviors, in which individuals obey others' commands to act due to authority enforcement (Milgram, 1974). Whereas, according to Health Belief Model (HBM), healthy behaviors of individuals depend on their perception of disease vulnerability. When an individual believes that she/he is at risk of a disease, they will do something more often to prevent the disease. This theory is used to describe the community's behavior in responding to disease (Rosenstock, 1974).

The Milgram Theory mentions that compliance is influenced by external factors i.e., region status, the status of the village's heads, figure legitimacy of the head of region, personal responsibility, support between communities, relationship of head of region with the communities (Afro, 2020). The theory focuses on how external factors such as authority reinforcement could shape individual and community compliance in conforming to a regulation. In the experiment conducted by Milgram, compliance to regulations among the participants was enhanced when they were forced and threatened with punishments for any irresponsible acts (Milgram, 1974).

On the other hand, HBM states that compliance to health protocols is a preventive effort performed by the community based on their perceptions on a disease and their chances to get it. It says that the individual's compliance is influenced by several factors such as perceived susceptibility, perceived benefit, perceived barriers, self-efficacy, and cues to action (Rosenstock, 1974). Therefore, HBM can be used to predict individual's compliance towards the practice of healthy positive behavior based on their perception of their disease, sickness, or accident. In addition, it can also be used to identify the change factors and individual's tendencies to act.

This study aims to assess the compliance towards the various health protocols that are put in place to prevent the transmission of Covid 19. Two theoretical frameworks are used and compared in understanding the compliance towards Covid 19 health protocols among the East Java communities.

METHOD

This is a cross sectional study design for primary data collection with applications of 2 selected theoretical frameworks to analyse and understand the compliance to Covid 19 health protocols. The research population is all people residing in East Java. The inclusion criteria of research respondents were residents aged 19-65 years, and are willing to fill out a questionnaire as evidenced by *informed consent*.The sample size was determined using the *Lemeshow* formula (Lemeshow et al., 1997), which resulted with 323 respondents. The number of respondents obtained for this study was inflated to 350.

Data on compliance of the people to Covid 19 health protocols were collected via online surveys from September to October 2020 among the people residing in East Java. The questionnaire was arranged by researchers based on operational definitions of Milgram's theory variables, Health Believe Model and compliance. The questionnaires had passed the validity and reliability tests, then were compiled in Zoho Survey Applications, so that they can be accessed via online. The link of the questionnaire was distributed through social media such as Instagram and WhatsApp Group which are owned by all research members.

The data for each variable was analyzed descriptively and grouped into 4 categories with the same interval width for each category. The level of compliance was categorized into: very non-compliant (0-25%), non-compliant (25.01% - 50%), obedient (50.01%-75%) and very obedient (75.01% -100%). Linear regression analysis was used to analyze the effect of individual perception variables (Health Believe Model theory) and external factors of Milgram's theory on compliance to health protocols.

The examination of the effect of external factors in Milgram's theory and internal factors in HBM was utilized to describe the condition between external factors, individual perception factor, and compliance factor in the community of East Java.

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Health Research Ethics Committee, Faculty of Public Health.

RESULTS

A total of 350 people had responded to the online surveys.

Table 1.

Distribution of respondents' characteristic (350)

Characteristics	n	%
Age group (years)		
19-35	283	80.86
36-50	64	19.06
51-64	3	0.08
Gender		
Male	106	30.29
Female	244	69.71
Education level		
No education	0	0
Primary	0	0
Lower secondary	4	1.05
Upper secondary	174	49.71
Tertiary	172	49,24
Occupation		
Unemployed	194	55.41
Self-employed	27	7.71
Private employee	66	18.91
Civil Servant	11	3.14
Military/police	1	0.26
Housewives	17	4.86
Others	34	9.71
Monthly income (IDR)		
<1.000.000	241	68.90
1.000.000-3.000.000	59	16.80
3.000.001-5.000.000	38	10.90
>5.000.000	12	3.40
Region		
Surabaya Raya	186	53.14
Outside Surabaya Raya	164	46.86

Table 1 shows the majority of respondents (80.86%) were 19-35 years old, 30.29 % respondents were female, and 55.41 % of respondents were unemployed. Respondents have varied levels of education and the majority of latest education was upper secondary level that accounted for 49.71%, and 68.90 % respondent's income were under Rp 1,000,000.00. Most of respondents (53.14%) lived in Surabaya Raya.

Table 2 shows the community's compliance with handwashing variable was the strongest variable at 58.9% compared to physical distancing and mask-wearing. The majority of the respondents were compliant with regular handwashing either with soap and running water or alcoholic antiseptic or a hand-sanitizer or avoiding touching eyes, nose, and mouth with unhygienic hands.

Table 3 presents the results of the linear regression test which showed some external factors in Milgram Theory significantly influenced compliance with health protocols. The results of the linear regression test also showed support between the communities had a p-value of 0.000 and a β-value of 0.277 on compliance with physical distancing. The β-value indicated that every unit of change in compliance with physical distancing was 27.7% contributed by support between the communities.

Moving to the next result, the influence of personal responsibility on compliance with mask-wearing yielded a ρ-value of 0.014 and β-value of 0.137. The β-value indicated every unit of change in compliance with mask-wearing was 13.7% contributed by a change in personal responsibility. Meanwhile, support between the communities significantly influenced compliance with mask-wearing with a ρ-value of 0.000 and a β-value of 0.212. The β-value indicated that every alteration in compliance with mask-wearing was 21.2% influenced by support between the communities. While the relationship of the head of region with the communities had significantly influenced compliance to mask wearing with a ρ-value of 0.009 and a β-value of 0.147. The β-value implied that every unit of change in compliance with mask-wearing was 14.7% contributed by every unit of change in the relationship of head of region with the communities.

Table 2.

Distribution of Community's Compliance with Health Protocols in East Java in September-October 2020

Variables of Community's Compliance with Health Protocols	Assesment Results								Total	
	No Compliant		Poor Compliant		Compliant		Fully compliant			
	n	%	n	%	n	%	n	%		
Physical Distancing	13	3.7	72	20.6	174	49.7	91	26.0	350	100.0
Mask wearing	7	2.0	42	12.0	129	36.9	172	49.1	350	100.0
Handwashing	0	0.0	15	4.3	129	36.9	206	58.9	350	100.0

In addition, the factors influencing compliance with handwashing were personal responsibility and support between the communities. Personal responsibility had a ρ-value of 0.000 and β-value of 0.247 on compliance with handwashing. This β-value implied that every unit of change in compliance with handwashing was 24.7% influenced by a change in personal responsibility. In the same way, support between the communities had influenced compliance with health protocols with a ρ-value of 0.000 and β-value of 0.199, indication that every unit of change in support between the communities was 19.9% influenced by a change in compliance with handwashing.

Table 4 shows the results of the linear regression test which described some items of an individual's perception in the Health Belief Model that had significant effects on compliance to the health protocols. The results also showed perceived barriers which had significantly influence compliance to physical distancing; ρ-value of 0.010 and β-value of 0.141. Similarly, cues to action had also significantly influenced compliance to physical distancing; ρ-value of 0.001 and β-value of 0.188. The β-value of perceived barriers implies that every unit of change in compliance to physical distancing was 14.1% influenced by a change in the perceived barriers. While, the β-value of cues to action indicates that every unit of change in compliance with physical distancing was 18.8% contributed by a change in cues to action.

Compliance with mask-wearing was significantly influenced by perceived barriers (ρ = 0.021; β = 0.125) and

cues to action (ρ = 0.000; β = 0.211). The β-value of perceived barriers indicate that every unit of change in compliance to mask-wearing was 12.5% influenced by perceived barriers. While, the β-value of cues to action inferred that every unit of change in compliance to mask-wearing was 21.1% influenced by a change in cues to action.

On the other hand, compliance with handwashing was significantly influenced by perceived benefit (ρ = 0.000; β = 0.224), perceived barriers (ρ = 0.001; β = 0.176), self-efficacy (ρ = 0.005; β = 0.162), and cues to action (ρ = 0.023; β = 0.116). The β-value of perceived benefit implies that every

unit of change in compliance to handwashing was 22.4% caused by a change in perceived benefits. Similarly, the β-value of perceived barriers indicates that every chance in compliance to handwashing was 17.6% contributed by a change in perceived barriers. While, the β-value of self-efficacy suggests that every unit of change in compliance to handwashing was 16.2% caused by a change in self-efficacy. While, the β-value of cues to action inferred that every unit of change in compliance to handwashing was 11.6% caused by a change in cues to action.

Table 3.
Influence of External Factors on the Community's Compliance with Health Protocols in East Java in September-October 2020

External Factors in Milgram Theory	Compliance with Health Protocols					
	Physical Distancing		Mask Wearing		Handwashing	
	β	ρ	β	ρ	B	P
Region status	0.048	0.391	0.123	0.024*	0.089	0.101
Status of the head of region	0.040	0.485	0.082	0.145	0.011	0.845
Legitimacy of the head of region	-0.064	0.281	-0.109	0.061	-0.054	0.351
Personal responsibility	0.097	0.090	0.137	0.014*	0.247	0.000*
Support between communities	0.277	0.000*	0.212	0.000*	0.199	0.000*
Relationship of the head of region with the communities	-0.005	0.934	0.147	0.009*	0.085	0.128

Table 4.
Influence of Individual's Perception on the Community's Compliance with Health Protocols in East Java in September-October 2020

Individual's Perception in Health Belief Model	Compliance with Health Protocols					
	Physical Distancing		Mask Wearing		Handwashing	
	β	ρ	β	ρ	B	ρ
Perceived Susceptibility	-0.051	0.314	-0.049	0.336	0.013	0.789
Perceived Benefit	0.098	0.102	0.113	0.058	0.224	0.000*
Perceived Barriers	0.141	0.010*	0.125	0.021*	0.176	0.001*
Self-Efficacy	0.095	0.121	0.097	0.114	0.162	0.005*
Cues to Action	0.188	0.001*	0.211	0.000*	0.116	0.023*

DISCUSSION

The Milgram Compliance Theory explains that individual's compliance is shaped by two interacting components: antecedent condition and agentic state (Milgram, 1974). Antecedent condition is a perception on legal authority. When individuals perceive others as the authority, they tend to take actions that will show themselves as obeying to the orders or mandates by the authority. Whereas, the agentic state is a condition where individual carry out the will of authority figure, but do not take responsibility for the consequence of their actions. In other words, she/he will become an agent for the commander's order.One who transforms to the agentic statecan accept actions performed by the legal authority (Milgram, 1974).

Region status may be defined as the community's understanding and awareness of the COVID-19 situation in their region. The results showed that region status could significantly influence compliance to mask-wearing which is supported by a study by Sun *et al.* (SUN et al., 2020). The findings form their study stated that regions in China that had high numbers of COVID-19 cases had made the community felt obligated to comply to the mask-wearing protocol. Similarly, this behavior was also observed in the communities of other Asian countries

Personal responsibility in Milgram Theory is described as an individual's capacity in executing the obligation of health protocols during the COVID-19 pandemic. The referred capacity is on the individuals' knowledge and understanding of regulations regarding health protocols and obligation to practice them. The results showed that personal responsibility could significantly influence compliance to physical distancing and handwashing with soap. These inherent capacity and responsibility attitudes seems to trigger them towards practicing health protocols during the COVID-19 pandemic. A study by Nygren and Olofsson (2020), supports the findings that the community will have high awareness of practicing health protocols as they care for others' safety.

Support between the communities is another motivation for obligation towards the practice of health protocols during the COVID-19 pandemic. The support between the communities could influence compliance to physical distancing, mask-wearing, and handwashing with soap. This was similar to findings from a previous study whereby the communities in 29 provinces in Indonesia had showed that despite their diverse cultures, when the communities had good support between them, there is good compliance towards the practice of health protocols (Yanti et al., 2020).

Regarding the external factors in Milgram Theory, the relationship of the head of region with the community is defined as the extent to which the community builds rapport

with the head of region during the COVID-19 pandemic. It refers to the two-ways communication between the head of region and the community with regards to the prevention and health protocols of COVID-19 either by direct communications of via the social medias. In this study, it was observed that the relationships between the regional head and the community had influenced compliance to mask-wearing. The community with a positive perception of what the regional head had done will view him/her as a role model which builds compliance to the regulations advocated by him/her (Yohanes Museng Ola Buluamang, 2018). A similar report of the government's authorities in Malaysia stated that a consistent relationship of the head of region with the community could improve their knowledge, behavior, practices, and motivation to implement health protocols (Azlan et al., 2020).

Several social psychologists had applied the concepts of HBM in understanding on how the perception patterns could stimulate the behavior in complying to the health protocols of COVID-19 (Elvin et al., 2018)(Costa, 2020)(Grodner, 2015). The HBM aims to focus on efforts to improve public health by understanding the causes of failure to adopt the various disease prevention measures. In HBM, people's confidence, such as perceived susceptibility, perceived benefits, perceived barriers, self-efficacy, and cues to action are believed to influence the community's commitment to promoting health (Kim & Kim, 2020). Perceived benefits have been shown to have a relationship with compliance to health protocols. In this study, the perceived benefits had a significant influence on compliance to handwashing with soap, in accordance to the findings from Darvishpour et al. (Darvishpour et al., 2018) that perceived benefits in HBM is the main predictor of behavior to disease prevention.

Meanwhile, perceived barriers are the perception of constraints that one faces. Regarding perceived barriers, it could be seen in this study that it has a significant relationship with compliance to Covid 19 health protocols; social distancing, mask-wearing, and handwashing with soap. These are like previous studies which had mentioned that perceived barriers could significantly influenced compliance to health protocols (Jose et al., 2021), (Abdo et al., 2018).

The next domain is self-efficacy which is someone's belief in his/her competence in completing a task successfully. In this study, self-efficacy had a significant relationship with compliance to handwashing with soap. It is in alignment with the results reported by Niu, et al. (Niu et al., 2020) who found that individuals tend to perform a preventive behavior if their competency is encouraged. Those with high self-efficacy are usually among the highly educated communities who keep tracks on updated information pertaining to COVID-19. However, in this study, majority of the community had low self-efficacy which tend to make them not having trust and could make lead to low compliance to Covid 19 health protocols.

Meanwhile, cues to action are signs of individuals performing preventive measures i.e., complying with health protocols. Cues to action commonly can be in the forms of events, individuals, or something that triggers one to perform the preventive measures. The results showed that cues to action had significantly influenced compliance to physical distancing, mask-wearing, and handwashing with soap. The results are in line with a previous study which found that high cues to action were related to high compliance to preventive measures of COVID-19 (Barakat & Kasemy, 2020).

The results in this study have displayed that community's compliance to Covid 19 health protocols was dependent on the internal factors in HBM. Compliance to the health protocols could remain in longer period and is an important strategy in supporting the government's efforts to control the pandemic in the country (Tadesse et al., 2020). Furthermore, a timely implementation of health protocols and high compliance to them are important for a successful decline in case fatality rate from Covid 19 (Suraya et al., 2020). The people, be it at individual, family and community level could play their role in ending the pandemic by complying to the health preventive measures, at the least.

CONCLUSION

Internal factors in HBM; perceived benefits, perceived barriers, self-efficacy, and cues to action have more influences on the community's compliance to health protocols such as physical distancing, mask-wearing, and handwashing, compared to the external factors in Milgram's theory. As the internal factors dominantly influenced the community's compliance, the community should be empowered to have better awareness, understanding, and self-motivation. Consequently, the community can build their character and behavior to persistently comply to any health protocols on their own accords. It is the obligations of the government and other relevant bodies to plan and implement policies towards improving the health literacy of the people.

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