

# Factors associated with compliance in implementing health protocols to prevent COVID-19 in Indonesia: A cross-sectional study

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## ABSTRACT

**Introduction:** To prevent the COVID-19 spread, the government requires people to comply with health protocols in public facilities, namely by wearing masks, washing hands and keeping a distance. This study aimed to determine what factors affect and reason for compliance in implementing health protocols.

**Methods:** This research was an analytical survey research with a cross-sectional design conducted in Semarang City, Indonesia, with a total sample of 400 respondents. The independent variables were age, education, occupation, and health status. The dependent variable was compliance in wearing masks, washing hands and keeping a distance. Data were analysed with logistic regression test with significance level of 0.05.

**Results:** From the survey, 76.6% of respondents obeyed wearing masks, 57.4% of respondents obeyed to wash their hands and 71.1% of respondents obeyed to keep their distance. The backward type logistic regression test found that the factors associated with health protocol compliance were age, education, occupation, health status, existing regulations and the desire to maintain health with a significance value of <0.001. However, field of work was not associated with using masks ( $p = 0.273$ ), while health status was not associated with handwashing habits ( $p = 0.344$ ).

**Conclusions:** Factors that are associated with respondents' compliance with the health protocol are age, education, occupation, health status, self-motivation and regulation. The government need to raise awareness on adhering health protocols through the promotion about healthy lifestyle.

**Keywords:** adherence; COVID-19; health awareness; health protocols

## Introduction

COVID-19 will not only have an impact on the health sector, but will also have an impact on the social, economic, educational and other fields (Ministry of Fianance, 2020). Research conducted by Sardar, Ray, Hasan, and Chitra (2022) shows that there is a reduction in the number of employees at companies even though online sales have increased. The government has formulated a strategy by making policies to deal with COVID-19 in the field of information and communication with a special task force to COVID-19 so that it can be accepted by the wider community by broadcasting live on TV, the government's official website, and creating an Android-based application for detecting COVID-19 events. Mass media have reported a lot of discussion

about the COVID-19, including the number of COVID-19 cases, prevention, health protocols, and vaccinations.

In order to break the chain and deal with COVID-19, the government through the task force prepares health protocols for every activity that potentially transmit the disease. For the prevention of COVID-19 in public places and public facilities, the government has prepared a health protocol for the community in public places and facilities (Ministry of Health, 2020). By implementing the health protocol, it is expected the people in a country to be able to avoid COVID-19 infection, for which the health protocol must be adhered. However, people's compliance towards the COVID-19 health protocol has not been widely studied.



Compliance to implement health protocols is part of community behavior in preventing COVID-19. A study found that knowledge affects behavior (Istiqomah and Notobroto, 2016) and there is a significant positive relationship between education level and healthy living behavior (Putri, 2017). Knowledge has significantly associated with the behavior of using personal protective equipment (PPE). Based on the results of this study, knowledge plays an important role in people's behavior, knowledge influenced by information obtained from the community (Erawati, Alfiani and Kurniasih, 2020). However, it is different from previous research that good knowledge is not in line with good behavior (Erawati, Puspita and Cahyaningsih, 2020).

Based on this background, the aim of this study was to analyse what factors and reasons were associated with

adherence in implementing health protocols to prevent COVID-19.

## Materials and Methods

### Study Design

This study was a quantitative research with an analytical survey approach with a cross-sectional design. The independent variables were age, education, occupation and health status. The dependent variable was compliance with the use of masks, hand washing and keeping a distance followed by reasons for compliance.

Table 1 Distribution of age, education, occupation, and health conditions (N = 400)

Variable	n	%
<b>Age</b>		
20-25 years	18	4.5
26 - 35 years	76	19
36 - 45 years	204	51.1
46 - 55 years	51	12.7
56 - 59 years	51	12.7
<b>Education level</b>		
SMP (Junior High School) or lower	34	8.5
SMA (Senior High School)	68	17.1
Universities	298	74.4
<b>Occupation</b>		
Public Services (security, banking)	60	14.9
Industry	17	4.3
Entrepreneur (trade, etc.)	25	6.4
Education	128	31.9
Health	34	8.5
Others (including Housewives)	136	34.0
<b>Health Status</b>		
Suffering from a disease	44	8.5
Healthy	366	91.5

Table 2 Distribution of health protocol adherence (N = 400)

Health Protocol Adherence	n	%
<b>Wearing a Mask</b>		
Always	306	76.6
Often	34	8.5
Sometimes	52	12.8
Never	8	2.1
<b>Washing Hands</b>		
Always	230	57.4
Often	68	17.0
Sometimes	94	23.4
Never	8	2.2
<b>Keeping a Distance</b>		
Always	284	71.1
Often	44	10.9
Sometimes	55	13.7
Never	17	4.3

Table 3 Distribution of reasons for complying with health protocols (N = 400)

Health Protocol	Reason			
	Regulations		Health intention	
	n	%	n	%
Wearing a Mask	56	14.9	340	85.1
Washing Hands in Public Facilities	56	14.9	340	85.1
Keeping a Distance in Public Facilities	68	17.0	332	83.0

Table 4 The results of data analysis of age, education, occupation and health status on the health protocol adherence

Variable	B	t	p-value
<b>Wearing Mask</b>			
Age	0.853	29.403	<0.001
Education	-0.648	-16.986	<0.001
Occupation	0.472	6.361	<0.001
Field of work	0.023	1.097	0.273
Health status	0.172	6.456	<0.001
<b>Washing Hands</b>			
Age	0.514	12.961	<0.001
Education	-1.054	-21.071	<0.001
Occupation	0.460	19.996	<0.001
Field of work	0.464	19.887	<0.001
Health status	0.078	0.948	0.344
<b>Keeping a Distance</b>			
Age	0.767	18.415	<0.001
Education	-0.858	-16.342	<0.001
Occupation	0.171	6.982	<0.001
Health status	0.558	6.486	<0.001

Table 5 Test results analysis of reasons for the habit of using masks, washing hands and keeping a distance

Variable	B	t	p-value
<b>Hand wash</b>	3.661	13.790	<0.001
Regulations	0.537	5.718	<0.001
Health	-1.599	-17.404	<0.001
<b>Using Mask</b>	4.892	37.122	<0.001
Regulations	0.126	2.710	0.007
Health	-2.009	-44.054	<0.001
<b>Keeping a Distance</b>	4.922	32.773	<0.001
Regulations	0.190	3.616	<0.001
Health	-2.056	-39.333	<0.001

## Respondents

The study was conducted in the city of Semarang, with a population of 1,096,637 residents. After calculating with the Slovin's formula, the number of samples was 400 residents by accidental sampling (non-randomized). Inclusion criteria in sampling are residents of Semarang City aged 20-59 years who are productive. The exclusion criteria in this study were residents of Semarang City aged 20-59 years who were unproductive, getting sick, or not working.

## Instrument

The research instrument used a closed questionnaire which was distributed online using a Google Form ([Supporting Information 1](#)). The form contains the first part, namely Informed Consent and the demographic characteristics of the respondents (age, occupation, education and health status). The second part consists of the habit of using masks, washing hands and keeping a distance. All independent variables are classified in [Table 1](#). Questions related to compliance with using masks, washing hands and keeping a distance are classified as always (4), often (3), sometimes (2), and never (1), followed by the reason for compliance (i.e. regulation or health reasons).

The validity of the previous questionnaire was tested in 30 respondents from 400 respondents as sample of this study with the help of Pearson's SPSS Product

Moment, it was obtained that arithmetic mean was 0.369 -0.976 or greater than r table, which is 0.349 (valid). Reliability test was by looking at the value of Cronbach's alpha and obtained a value of 0.897 (reliable).

## Data Collection

Data collection was carried out within two months (November-December 2020). Data retrieval by accidental sampling was distributed in several WhatsApp groups with the help of 15 enumerators who had different characteristics (age and occupation) to avoid data bias in certain groups. The 15 enumerators were previously known to the researcher. The researcher coordinated with the enumerators regarding the explanation of the questionnaire, the enumerator's rights and the tasks carried out by the enumerator by distributing the questionnaire link via WhatsApp.

## Data Analysis

The data analysis carried out was univariate and bivariate analysis. The distribution of characteristics, distribution of adherence and distribution of reasons for complying with the protocol were carried out by univariate analysis. To see what factors associated with the health protocol, bivariate analysis was carried out by performing a backward type logistic regression test with the help of SPSS 16. The t-table value with a sample of 400 was 1.966, and the researcher used a value of  $\alpha = 0.05$ . so that, if the analysis results get a t value of more than 1.966

or less than 0.05, it will be used as a factor that affects compliance in implementing health protocols. If the t value is less than 1.966 or is more than 0.05, it is not used as a factor that is associated with compliance in implementing health protocols.

### Ethical Consideration

This research has passed the ethical test with no. 60/EC-LPPM/UWHS/XI-2020 was issued by the Ethics Committee of Widya Husada University Semarang.

### Results

[Table 1](#) shows the age characteristics of the majority of respondents are 36-45 years old, namely 51%. The majority of respondents were highly educated (74.4%). Regarding job characteristics, the majority of the respondents worked outside the field of education or internal industry, namely 34%. The characteristics of the health conditions of the majority of respondents are healthy, namely 91.5%.

Based on [Table 2](#), it is known that the majority of respondents comply with health protocols, both in using masks, washing hands and maintaining distance; 76.6% of respondents always use masks, 57.4% wash their hands in public places and 71.1% of respondents keep their distance in public places.

[Table 3](#) shows the majority of respondents comply with health protocols because they want to maintain their health to avoid COVID-19, which is 85.1%, but there are still those who comply because of regulations, which are 14.9% on compliance with wearing masks and washing hands and 17% on adherence to social distancing.

With a sample of 400 respondents, it was found that the df was 393 and the t-value was 1.966. After carrying out a backward test between the use of masks and the variables of age, education, occupation and health status simultaneously, it was found that the field of work had a t-value of less than 1.966 and a significance value was obtained of 0.273 or greater than 0.05 so that the field of work was not a factor affecting the use of masks in the prevention of COVID-19. However, age, education and health status are factors associated with respondents in wearing masks for the prevention of COVID-19.

Backward type logistic regression test between the variables of age, education, occupation and health status on hand washing found that the health status variable had a t-value of 0.948 or less than 1.966 and had a significance value of 0.344 or more than the probability value, which was 0.05 so that health status was not a factor that associated with respondents' compliance in washing hands in public facilities to prevent COVID-19. However, age, education, field of work are factors that were associated with respondents' handwashing habits in public facilities in preventing COVID-19.

Backward test between the variables of age, education, occupation and health status on maintaining distance in public places found the t-value in all independent variables is more than 1.966 and the significance value in all variables is less than the probability value. So age, education, occupation and health status are factors that were associated with social distancing habits in public places.

After a regression test was conducted between the habit of using masks and the reasons for complying with the regulations, it gave a significance value of 0.07 or more than 0.05. The habit of using a mask with a desire to be healthy gives a significance value of <0.001. The habit of washing hands, the habit of keeping a distance from the reasons for complying with regulations and maintaining health gives a significance value of <0.001.

### Discussions

#### Factors Associated with Mask Use

The majority of respondents implemented health protocols, with an average of 68.4%. However, the habit of washing hands occupies the lowest average, which is 57.4%. This means that from all respondents there are those who always use masks, always keep their distance but don't always wash their hands.

According to UNICEF, the spread of COVID-19 is through splashes of phlegm containing the virus that enter the body through the eyes, nose or throat. However, it most often occurs through hands contaminated with droplets that eventually enter the body through the eyes, nose or throat (UNICEF, [2020](#)). Droplets that are splashed directly can cause droplets to stick to objects which are then held by other people who are not affected by COVID-19. Droplets enter the oral or nasal mucosa or the conjunctiva of the eye. For this reason, the government made rules for all residents to always wear masks and wash their hands (Ministry of Health, [2020](#)).

Based on the results of the backward test, it was found that the job characteristics had a significant value of 0.273 or more than 0.05, which means that work does not have a significant effect on the habit of using masks. The characteristics associated with the habit of using masks in this study are the characteristics of age, education and health status. This supports the research conducted by Juanda ([2020](#)) that education has a positive association on compliance and supports Notoatmodjo's theory that education is an exogenous factor that influences behavior (Notoadmojo, [2012](#)). Research conducted by Ozdemir, Ng, and Chaudhry ([2020](#)) found that the strongest indicator of behavior change in preventing COVID-19 is that respondents who are older, highly educated, anxious and married report higher adoption/frequency of preventive measures.

Work does not affect the use of masks, meaning that masks have become a habit of the people during the

pandemic in 2020, Even though working in health, education, industry or other occupations does not have a significant effect on wearing masks. The reason for wearing masks is 85.1% for maintaining health, meaning that the community already understands the importance of masks in preventing COVID-19.

### Factors Associated with Handwashing

The results of the backward test show that the characteristics of age, education and occupation have a significantly smaller value than the probability so that it can be interpreted that age, education and occupation have an effect on hand washing habits, but health status has a significance value greater than the probability value, which is 0.344. So that health status does not affect respondents in washing their hands.

Respondents who have poor health conditions do not care about washing their hands. Although people who have inherited diseases have a higher risk of getting worse if they get COVID-19 (Zandkarimi, 2020).

The results of this study are not in line with research conducted by Riyadi and Larasaty (2020) that health status has a positive association with health protocol compliance. If it is associated with 14.9% of respondents who obediently wash their hands for reasons of regulations, it is necessary to give rules for mandatory hand washing areas, because so far public places only the areas where masks are mandatory.

### Factors Associated with Social Distancing

The results of the backward test showed that the characteristics of age, education, field of work and health status can predict respondents behaviour in complying social distancing. This supports previous studies that state health behavior is associated with age, education, occupation and health status. Supporting research conducted by Dewi, Adawiyah, and Rujito (2019) found age has a significant influence in complying with the use of PPE and research conducted by Mualama (2020) showed that the majority of adults in his research have a healthy lifestyle (Muamala, 2020). Recommendations from the WHO that maintaining physical distance, wearing face masks, avoiding crowds, and practicing hand hygiene are forms of controlling COVID-19, the correct use of masks is highly recommended (Claeson, 2021).

### Reasons for Implementing Health Protocols

In this study, showing compliance in implementing health protocols because they want to maintain health or to avoid COVID-19 is higher than because of the regulation factor can mean that respondents are aware of the causes of COVID-19 transmission even though there are still those who carry out health protocols because of regulations. However, from the results of the regression

test, it was found that the factor complying with the regulations on the habit of wearing masks got  $p = 0.07$ . It means that respondents think they can maintain their health and prevent COVID-19, only by wearing masks.

Contrary to what Claeson and Hanson (2021) said, the involvement of policy makers has an effect on changing people's behavior and research conducted by Stewart et al. (2020) found the need for collaboration from all parties, both health workers, government, communities, to form learning experiences for the community. The government sets rules for all citizens to always wear masks and wash their hands (Ministry of Health, 2020).

Socialization is an important step in implementing policies. Government and public health efforts in encouraging the prevention of COVID-19 are carried out by providing counseling or socialization (Sriarumtias et al., 2020). Social media is one of the factors facing COVID-19 (Addis and Abate, 2021).

The socialization of COVID-19 prevention by always wearing masks for respondents has been successful; however, prevention of always washing hands and keeping a distance in public facilities still needs to be improved because there are still respondents who obey hand washing and keep their distance for reasons of only complying with regulations.

This study did not examine implementation policies in the prevention of COVID-19 so it cannot know what can be known in compliance with implementing health protocols.

### Conclusion

Age, education, occupation and health status are compliance factors in implementing health protocols to maintain distance, but field of work was not associated with using masks, while health status was not associated with compliance in washing hands. People must be aware that maintaining health begins with self-prevention, not only because of obeying the rules. This study suggest that the government need to encourage and raise awareness about personal health than regulation enforcement. The socialization of preventing COVID-19 by always wearing masks has been successfully carried out, but not yet on the habit of washing hands and keeping a distance.

### Supporting Information

#### [Supporting Information 1](#)

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