



Original Research

## The Relationship Between Level of Knowledge and Behaviors of COVID-19 Prevention among Indonesian Population

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### ABSTRACT

**Introduction:** Currently, there are no specific drugs to cure COVID-19, so it is an important strategy to be implemented in the community to increase knowledge and preventive behavior in order to prevent transmission. The purpose of this study was to see the relationship between the level of knowledge and preventive behavior against COVID-19 among Indonesian population.

**Methods:** This study used an analytical method with a cross-sectional design. Samples were taken from the people of Depok City as many as 406 people. The independent variable was knowledge and the dependent variable was preventive behavior. The instruments used were questionnaires on the characteristics of the respondents and knowledge and behavior with online questionnaire via Google Forms. The sampling technique was non-probability sampling with a consecutive sampling method. Data analysis used descriptive analysis test, Chi-square and correlative hypothesis test.

**Results:** The results showed that respondents have good knowledge (56.9%) and good prevention behavior (75.9%). The largest source of information about COVID-19 respondents was from Television News (84.4%). There was a significant relationship between the level of knowledge and preventive behavior toward COVID-19 ( $p=0.000$ ). Moreover, there is a significant relationship between age ( $p=0.000$ ), gender ( $p=0.000$ ), education level ( $p=0.000$ ) and work status ( $p=0.016$ ) with knowledge.

**Conclusion:** The findings suggest that the local government should initiate an innovative program of health education focusing on knowledge and preventive behavior toward COVID-19 at a community level. The strategies to combat COVID-19 will require community involvement to control and prevent the disease outbreak.

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### INTRODUCTION

Corona Virus Disease 2019 (COVID-19) is an infectious disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which was first discovered in the city of Wuhan, China at the end of December 2019 (WHO, 2020a). This virus causes disease from human to animals and has now been transmitted from human to human (Kemenkes RI, 2020a; WHO, 2020b) In humans, this virus can infect the respiratory path with the main symptoms of fever, dry cough, shortage of breath (Daryai et al., 2020; Hoque et al., 2020; Taghrir et al., 2020; WHO, 2020b) including other nonspecific symptoms such as headache, dyspnea, fatigue and

muscle pain (Mo et al., 2020). There are also those who report suffering from symptoms, digestion such as vomiting and diarrhea (Huang et al., 2020). This virus spreads very quickly and has spread to almost all countries, including Indonesia, in just a couple of months. At least more than 200 countries around the world have been infected so that this virus becomes a serious threat to public health in the world (Ahmed et al., 2020; Daryai et al., 2020; Hoque et al., 2020).

According to WHO (2020a) there were an additional 185,536 cases as of July 14, 2020, bringing the total cases in the world to 13,150,645 cases while developments in the case in Indonesia has taken a significant increase amounting to 1,591 cases spread over 34 provinces and 461 cities with the total cases

of 78,572 patients. Depok is a city in West Java Province, where it is the second province with the highest number of cases after DKI Jakarta with an increase of 74 cases, with the total number of positive cases being 5,160. Meanwhile, Depok City is the first city where the COVID-19 cases appeared. As of July 14, 2020, there were also seven additional cases in Depok, with the total number of confirmed positive patients 890 people, so it can be concluded that the transmission is still ongoing up to now (Kemenkes RI, 2020b).

The increasing number of cases has impacted on many fields in various aspects, either health, economy, politics, social, education, religion or even security. Sukmana et al. (2020) stated that COVID-19 has an impact on health, tourism, economy, social and other sectors. The biggest major impact is in the health sector where there are additional positive cases that threaten public health and even cause death. On the other hand, the economy is also very much impacted, where people find it difficult to find jobs, difficulty to meet their daily needs, and even lose their income. Meanwhile, Indonesia's economic figure continues to significantly decline by 5%. The Minister of Finance said that if the prevention strategies were not implemented correctly and properly, Indonesia's economic growth could be depressed to a level of 2.5% or even lower (Hanoatubun, 2020). That is why an effective and correct handling strategy is needed to maintain the stability of an economy that is being threatened.

At the moment, there are no specific drugs and vaccines to fight COVID-19; therefore, the most crucial strategy in the community is preventive behavior to reduce the number of cases. Cvetković et al. (2020) and Ouassou et al. (2020) stated that preventive behavior with a clean and healthy lifestyle is effective for controlling and breaking the chain of transmission of COVID-19, when pharmacological interventions have not been found. Preventive actions that can be taken are washing hands regularly, covering mouth and nose with a mask, avoiding touching the face, covering mouth when coughing and sneezing, isolating cases that are suspected of being positive at home, maintaining a minimum distance of one meter (Cvetković et al., 2020; Daryai et al., 2020; Kemenkes RI, 2020a), implementing a clean and healthy lifestyle, controlling comorbid diseases and managing positive emotions (Kemenkes RI, 2020a).

The basis for change and prevention must start in society because it is a key element in the success of reducing the COVID-19 numbers. This is confirmed by the research of Qiu et al. (2020) on the public in China, that the involvement of the society in prevention factors significantly reduces the rate of virus transmission. The community must take responsibility for the health and safety of their family members by providing them continuous education. A preliminary study conducted by researchers in China resulted in the large number of people who gather at several points for such unnecessary activities, leaving the house without putting a mask on, wearing a mask

but not in an appropriate way and other activities that do not apply health protocols.

The increasing number of positive cases continues every day probably because of inappropriate community preventive behavior. This could be based on a lack of knowledge or biased behavior by disobeying government calls. Health education is needed on knowledge of disease prevention and control behaviors to reduce the incidence of COVID-19 (Ouassou et al., 2020). Based on the above background, the researcher was interested in conducting research on the relationship between the level of knowledge and prevention behavior against COVID-19 in Depok City.

## MATERIALS AND METHODS

This research used a correlation analytic method with a cross-sectional design which aims to find the relationship between the level of knowledge and behavior of the people of Depok City towards the prevention of COVID 19.

The data were obtained from questionnaires that were distributed to the researchers' social media accounts via Google Forms which were filled in online because of the COVID-19 pandemic situation. In addition, the researcher also asked for the help of students and colleagues to distribute questionnaires through their social media accounts. In the questionnaire, the instructions for filling and a statement of the respondent's willingness to be used as research respondents were explained.

Respondents who gave consent to willingly participate in the survey would click the 'Continue' button and would then be directed to complete the self-administered questionnaire. The Research and Community Service Unit of STIKes Raflesia (UPPM) approved our study protocol, procedure, information sheet and consent statement (Number: 247 B/STIKES-RAF/VII/2020). The ethical principles used during the research involve using the informed consent principles, anonymity, confidentiality and justice. After that, the researcher distributed the questionnaires.

Research data collection was carried out from July 20 to August 3, 2020, with a total population of all Depok City people aged 15-69 years, as many as 884,540 people. The minimum sample size obtained is 399.8 people based on the Slovin formula calculation (Nursalam, 2017). The consecutive sampling method was used for sampling where respondents are willing to fill out the questionnaires if they meet the inclusion criteria. The inclusion criteria for this study were willing to become respondents, age range between 15-69 years, living in Depok City, and able to read. The number of samples obtained was 406 people.

Knowledge was measured with 14 closed-ended questions and categorized into good (>75%), moderate (56-74%) and insufficient knowledge (<55%) (Arikunto, 2016). Meanwhile, preventive behavior was measured with 13 close-ended

questions on a 3-point Likert scale which is categorized into good (75%), moderate (56-74%) and insufficient behavior (55%) (Budiman & Riyanto, 2013). Meanwhile, the confounding variables were age, gender, education, occupation and sources of information.

The survey instrument was an adapted from previous research (Calano et al., 2019; Sari et al., 2020; Zhong et al., 2020) and Guidelines for the Prevention and Control of Coronavirus Disease, Revision IV (Kemenkes RI, 2020a). The questionnaire was tested for its reliability and validity. Cronbach's alpha value for the reliability of the knowledge questionnaire was 0.675. The result added credence where, according to Griethuijsen et al. (2014), the range of Cronbach's alpha within 0.6 to 0.7 is considered adequate and reliable. Data analysis was performed using IBM SPSS statistical software version 20. The researcher performed univariate and bivariate analysis (Chi-square).

## RESULTS

### The Characteristics of the Respondents

Based on Table 1, it is shown that the majority age of respondents are 12-25 years old (49.3%). Based on gender, the majority of respondents were 68.5% women. In addition, based on the education level, the majority of respondents earned senior high school education (52.7%). Based on employment status, the majority of patients were employed (86.5%). Most of them obtained source of information about COVID-19 from television news (8.4%) and at least 0.7% received information from family doctors. The respondents were allowed to answer more than one regarding the source of information.

### The Relationship Between Knowledge Level and Preventive Behaviors

Table 2 explains that the majority of respondents have good knowledge (56.9%). The distribution of respondents based on prevention behavior shows the majority of respondents with good preventive behavior was 75.9%.

### The Relationship Between Respondents' Characteristics and Knowledge Level

Table 3 explains that the majority of respondents having a good level of knowledge are aged 12-25 years (31%). In the gender category, the majority who have a good level of knowledge are women (43.8%). The majority of respondents who have a good level of knowledge in the education level category graduated from senior high school or equivalent (28.3%). Majority of respondents based on the employment status category who had a good level of knowledge were respondents who worked (47%). The chi-square test showed that age, gender, level of education, and employment status have a significant relationship with knowledge level.

Table 1. Respondents' characteristics

Characteristics	n	%
<b>Age</b>		
12-25 years	200	49.3
36-45 years	162	39.9
46-65 years	41	10.1
>65 years	3	7
<b>Gender</b>		
Male	128	31.5
Female	278	68.5
<b>Education</b>		
Elementary school	14	3.4
Junior high school	32	7.9
Senior high school	214	52.7
Higher education	146	36
<b>Employment status</b>		
Employed	351	86.5
Unemployed	55	13.5
<b>Source of information</b>		
Television news	343	84.4
Radio	216	53.2
Newspaper, magazine	156	38.4
Friends, relatives, colleagues	91	22.4
Online social media	45	11.08
Government/WHO official websites	14	3.4
Online news portal	5	1.2
Family doctors	3	0.7

Table 2. Respondents' knowledge and preventive behavior

Variable	n	%	
Knowledge Level	Insufficient	41	10.1
	Moderate	134	33
	Sufficient	231	56.9
Preventive Behaviors	Insufficient	29	7.1
	Moderate	69	17.0
	Sufficient	308	75.9

### The Relationship Between Knowledge Level and Preventive Behavior

Table 4 shows that respondents who have good knowledge and have good preventive behavior are 54.9%. The results of statistical tests using the Chi-square test obtained  $p = 0.000$ , which means that there is a relationship between the level of knowledge and COVID-19 prevention behavior. It can also be seen that the correlation coefficient value is 0.642, which means that the close relationship between the level of knowledge and COVID-19 prevention behavior is strong. A positive value means that if the level of knowledge increases, the better the preventive behavior will be.

## DISCUSSION

This study found that there was a significant relationship between age and the level of knowledge about COVID-19. The correlation coefficient value shows that the higher the age, the knowledge about COVID-19 is minimum. This study aligns with research by Scoy et al. (2020) but contrasts with some previous research (Bates et al., 2021; Kirac et al., 2021; Wulandari et al., 2020). According to Leric and Damayanti (2020), the relationship between age

Table 3. The Relationship between Respondents' Characteristics and Knowledge Level against COVID-19

Characteristics		Knowledge Level						Total	p-value	Correlation coefficient	
		Insufficient		Moderate		Sufficient					
		n	%	n	%	n	%				
Age (years)	12-25	5	1.2	69	17	126	31	200	49.3	0.000	-0.166
	26-45	27	6.7	49	12.1	86	21.2	162	39.9		
	46-68	9	2.2	16	3.9	19	4.7	44	10.8		
Gender	Males	22	5.4	53	13.1	53	13.1	128	31.5	0.000	0.218
	Females	19	14.7	81	20	178	43.8	278	68.5		
Education Level	Elementary and junior high school†	25	6.2	17	4.2	4	1	46	11.3	0.000	0.397
	Senior high school	12	3	86	21.2	115	28.3	213	52.5		
	Higher education	4	1	31	7.6	112	27.6	147	36.2		
Employment status	Unemployed	1	0.2	14	3.4	40	9.9	55	13.5	0.016	0.134
	Employed	40	9.9	120	29.6	191	47	351	86.5		

†) Elementary and junior high school levels were combined into one category because three cells (25%) had an expected value less than 5, which was exceeding the maximum 20% standard for Chi-square test.

Table 4. The Relationship between Knowledge Level and Preventive Behavior against COVID-19

Knowledge	Preventive Behaviors						Total	p-value	Correlation coefficient	
	Insufficient		Moderate		Sufficient					
	n	%	n	%	n	%				
Insufficient	24	5.9	15	3.7	2	0.5	41	10.1	0.000	0.642
Moderate	5	1.2	46	11.3	83	20.4	134	33.0		
Sufficient	0	0	8	2	223	54.9	231	56.9		
Total	29	7.1	69	17	308	75.9	406	100		

and level of knowledge about the myths and facts of COVID-19 was nowhere to be found. Different results to this research are conveyed in Nurmala et al.'s (2018) study, that people of different ages were able to have the same exposure to information. Wawan and M (2014) presented a different perspective which explains that the more people grew up, the level of maturity and strength of a person will be more in thinking and working.

This study also found female participants with better knowledge and preventive behavior than male ones. These findings were consistent with some of previously conducted studies (Bates et al., 2021; Hosen et al., 2021; Kirac et al., 2021; Wulandari et al., 2020). Their research shows a relationship between gender and *physical distancing* prevention behavior where the gender variable has a significant relationship with *physical distancing* behavior. The women tend to have good *physical distancing* behavior by 3.4 times better than men.

In addition, in this study there is a relationship between work status and the level of knowledge about COVID-19. This is following the theory presented by Nursalam (2011) that work will affect a person's level of knowledge. While the correlation coefficient shows that the relationship is very weak and has a positive correlation, which means that if the respondents work, the level of knowledge is increased. It is the same with the results of research by Scoy et al. (2020) and (Bates et al., 2021) but contrary to the research conducted by Wulandari et al. (2020).

Last, this study found that the respondents with higher education had higher knowledge. This result is the same compared with previous research

(Anhusadar & Islamiyah, 2020; Bates et al., 2021; Hosen et al., 2021; Kirac et al., 2021). This result is also supported by Nursalam (2011), that a person's knowledge is also influenced by educational factors. However, the result of this research is contrary to some previously conducted studies (Lerik & Damayanti, 2020; Wulandari et al., 2020). It has been assumed that information or knowledge is not only obtained in formal education but can be obtained from experience, environment, and non-formal education (Ayurti et al., 2016; Wawan & M., 2014). Any information greatly affects a person's knowledge; even though someone has low education, when he/she is often exposed to information from various sources, the knowledge will be increased. The educational factor is not very influential because various information about COVID-19 at this time is very easy to be accessed (Wawan & M., 2014).

There is a significant relationship between the level of knowledge and COVID-19 prevention behavior in respondents. These results echo the research conducted by Sari et al. (2020) which stated that there is a relationship between public knowledge and obedience in the use of masks as an effort to prevent COVID-19 in Ngronggah. Research by Syadidurrahmah et al. (2020) also showed that the variable of knowledge related to physical distancing has a significant relationship with physical distancing behavior. This research shows that respondents who have good knowledge of physical distancing have a 1.7 times chance of having good physical distancing behavior than those who have less knowledge.

The correlation coefficient states that, if the level of knowledge increases, the prevention behavior will be better. This is supported by Juwariyah and

Priyanto (2018) and Hosen et al. (2021) but contrasts with research by Bates et al. (2021). Knowledge and behavior factors play a role in forming healthy habits (Shaw, 2016). Most people have inadequate health behaviors due to a lack of knowledge of health (Nurjanah & Mubarokah, 2019). Knowledge is a very important domain to create one's actions (Nurmala et al., 2018). Behavior which is based on knowledge, awareness, and positive attitude will last longer rather than behavior that is not based on these three things (Notoatmodjo, 2014). As previously discussed, many factors connect knowledge and behavior. Knowledge is a predisposing factor before a person adopts a new behavior; people must understand first about the meaning or benefit of this behavior for one's self or family (Notoatmodjo, 2014). A person will take preventive action for COVID-19 if he/she knows what the benefits and goals of prevention are for (Hamel et al., 2020). Pratama and Hidayat (2020) found that society is still maintaining social distancing because they recognize the importance of the safety of themselves and others.

The results of the research show that there are still respondents who have good knowledge with adequate preventive behavior (2%). This is possible because of other factors from that person. As everyone knows, the COVID-19 pandemic has had many impacts on the various sectors. Economic sectors have a big impact on society. Now people experience difficulties to find jobs, experience difficulties to fulfill their daily needs, and even lose their income (Hanoatubun, 2020; Pratama & Hidayat, 2020) so even though people have good knowledge, they are constrained by the economy because they do not have money to buy masks, hand sanitizers or vitamins to prevent COVID-19, and thus, preventive behavior cannot be done properly. The other influencing factor is the social relationship factor in the form of disruption of social relations. There is still a belief that social distancing will lead to distant social relationships (Pratama & Hidayat, 2020). The lack of preventive behavior can also arise due to the non-obedience factor, a condition when an individual or group wishes to comply but several factors stop them from being submissive to the advice given by health professionals (Prihantana & Wahyuningsih, 2016).

This study has limitations by conducting research in one location, as in Depok, Indonesia. The study may be conducted in other areas to explore the same context with various variables. In addition, the data collection instruments, particularly the behavioural aspect, were self-administered by the respondents; thus, the researchers could not directly observe the actual behaviour demonstrated by the participants.

## CONCLUSION

The results showed that a good level of knowledge will lead to good behavior as well. Variables of age, gender, education level, work status also have a relationship with a person's level of knowledge. Innovative health education is still needed to increase

public knowledge in order to increase knowledge and prevention behavior for reducing the risk transmission of COVID-19. This study can provide input on level of knowledge and COVID-19 behavior to the government in making the right policies and strategies regarding COVID-19.

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