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Original Article

Knowledge, Attitude, and Practice toward COVID-19 Infections among Preclinical Medical Students in a Public University in Depok, Indonesia

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ABSTRACT

Preclinical medical students have a big role as agents of change to raise awareness of the pandemic caused by Coronavirus Disease 2019 (COVID-19) infection in family, friends, and society. This study aims to determine the final stage of preclinical medical students' knowledge, attitudes, and practices (KAP) toward COVID-19 infection. This study used a cross-sectional method that was conducted on 213 final-stage preclinical medical students in a public university in Depok, Indonesia using an online validated KAP Questionnaire that measures age, gender, domicile, class, and level of KAP toward COVID-19 infection. Data were analyzed using SPSS 21. The p-value <0.05 indicates statistical significance. The result KAP of students toward COVID-19 infection showed a good level of knowledge (73.7%), positive attitude (96.2%), and positive Practice (83.6). %). There was no relationship between the level of knowledge and attitudes toward COVID-19 infection because a p-value of 0.211 (p >0.05) was obtained. Meanwhile, there was a relationship between the level of knowledge and practice toward COVID-19 infection with a p-value = 0.044 (p <0.05). The results revealed that the majority of preclinical medical students had favorable attitudes, had adequate knowledge of COVID-19, and used effective practices to stop the transmission of the disease.

Keywords: *Attitude, COVID-19, Knowledge, Medical Student, Practices.*

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INTRODUCTION

Since the first infection was discovered by a lab in Wuhan City, Hubei Province, China, the coronavirus pandemic has restricted global travel and social interaction for over two years.[1] Starting with the observations of the personnel at the Huanan seafood wholesale market in Wuhan City, who suffered from a puzzling pneumonia outbreak accompanied by signs of acute respiratory infection, exhaustion, and digestive system issues.[2] The infection was discovered to be a new beta-coronavirus after investigation, and it was given the name 2019 novel coronavirus, which is what causes coronavirus disease (COVID-19) in the world today.[3] This virus is related to the Severe Acute Respiratory Syndrome Coronavirus 2 (SAR-CoV-2) and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) since it has been linked to outbreaks in multiple nations over the past few years, the same clinical signs, but not necessarily specific.[2] In just two weeks, COVID-19 has spread to several nations outside of China, and more people are becoming infected with the virus. COVID-19 can be distributed by people either directly or indirectly through things. Because SARS-CoV-2 can spread through

droplets created by coughing, sneezing, or talking, transmission through direct contact is possible.[4] According to reports, 118 countries were affected by this outbreak at the time. Therefore, COVID-19 was deemed a pandemic by the World Health Organization (WHO) on March 11, 2020.[5]. On March 2, 2020, the President of the Republic of Indonesia Joko Widodo (Jokowi) held a news conference at the Presidential Palace to officially announce the first incidence of COVID-19 in Indonesia.[6] Since the initial case, only the subsequent three months have seen a sharp rise in COVID-19 cases in Indonesia. President Jokowi declared non-natural disasters brought on by the widespread spread of COVID-19 to be national disasters in the same year. The government has implemented several strategies to stop the spread of COVID-19, one of which is Large-Scale Social Restrictions (LSSR)/*Pembatasan Sosial Berskala Besar* (PSBB). Starting with PSBB, PSBB Java-Bali, Enforcement of Community Activity Restrictions (ECAR)/*Pemberlakuan Pembatasan Kegiatan Masyarakat* (PPKM), emergency PPKM, and PPKM levels 1-4, where the policy was adjusted to the circumstances of COVID-19 at that time, the nomenclature and content of this policy altered multiple times. All parties working under the local government's coordination are subject to this policy.[7]

Unfortunately, despite the sharp rise in COVID-19 cases, it appears that several Indonesians lack enough information about the disease. This is related to how widely COVID-19 information is disseminated online and on social media, whether the material is correct, false, true, or false, which leads to disinformation.[8] The WHO later labeled this phenomenon as an infodemic. Infodemics develop as a result of an abundance of information sources, including incorrect and misleading information, in the physical and digital environment during disease epidemics. Of course, this results in errors in society and encourages risk-taking practices toward COVID-19. Because of widespread mistrust of health officials and the weakened public health response, the WHO believes that the existence of this infodemic is more harmful than a pandemic.[9] Therefore the importance of health literacy related to COVID-19 is increased.[10] Currently, wearing masks, frequently washing hands, and keeping a safe distance are the best practices for preventing the COVID-19 pandemic.[11,12] These initiatives also need to be supported by knowledge, attitudes, and practices (KAP) that will influence society's healthy preventive.[13] Having a role model has a big impact on society. Someone having a background in health, such as a health worker or a medical student, can serve as a good role model. Particularly in light of the present pandemic, health professionals must spread awareness and carry out disease prevention initiatives.[14] Medical students must be evaluated to ascertain their level of KAP-related COVID-19.[15] A crucial survey that must be conducted during a pandemic is the KAP survey. This survey can reveal respondents' fundamental knowledge, misperceptions, beliefs, practices, and attitudes toward disease.[16]

Medical students who have KAP in a good category will have a positive impact on dealing with a pandemic as agents of change in the COVID-19 pandemic. Thus, they can exert a positive influence and change the perceptions of their friends and family because medical students are considered reliable sources of health information.[17] This was further supported by other investigations, including one by Linawati et al.[18] According to KAP COVID-19, there is a correlation between students' positive attitudes and excellent practices in connection to COVID-19 prevention and their moderate-high awareness of the disease. KAP has been investigated by researchers from several nations with a variety of participants, such as the studies by Masoud et al,[19] Sujarwoto et al,[20] but very few medical students,[13,21] particularly among those at the final stage of preclinical medical students, nearly none. This study focused on the final stage of preclinical medical students because they are preparing to enter the clinical phase and they must have good KAP because it will have an impact on the standard of medical care they will give their patients, to protect medical students who might be exposed to COVID 19. Therefore, based on the background information provided above, the purpose of this study is to determine whether there is a correlation between the level of KAP and COVID-19 infection among the final stage of preclinical medical students at the Faculty of Medicine, Public University in Depok, Indonesia.

METHOD

Research Design and Participant

In February 2022, during the third wave of the COVID-19 pandemic, and in August 2021, during the second wave, the final stage of

preclinical medical students at the Faculty of Medicine, Public University in Depok, were recruited for the study using a cross-sectional methodology and the KAP online questionnaire. 213 preclinical medical students in their final year of study answered the survey.

Measurement Tools

This study makes use of the valid and trustworthy KAP questionnaire, which was developed by Rasyid,[22] and is a reliable and valid tool. According to the results of the instrument analysis, every item has a Content Validity Index (CVI) greater than 0.80, making every item necessary for measuring KAP. The three domains had high item reliability scores (0.89 for attitudes, 0.81 for knowledge, and 0.84 for practice domains). The four key sections of this questionnaire are as follows: (1) The respondent's sociodemographic information, which includes their name, gender, level, age, semester, class, and address or city of residence; (2) The knowledge category consists of 15 questions covering the definition, epidemiology, pathophysiology, clinical manifestations, diagnosis, and management of COVID-19 disease. (3) The attitude and (4) practice categories also contain 15 questions about COVID-19. The respondent is required to select either "right" or "wrong" for each item in the knowledge domain. In contrast, each of the attitude and practice tests had 15 items on a four-point Likert scale. Regarding the attitude domain's items, respondents were asked to indicate their level of agreement with each statement by choosing one of four options: (1) strongly disagree, (2) disagree, (3) agree, or (4) strongly agree. In terms of practice, respondents were asked to select one of four options that best represented their routines during a pandemic, including (1) never, (2) sometimes, (3) often, and (4) always.

Data Processing and Analysis

Before being processed, survey data were downloaded in.csv format and verified by the authors. For data analysis, Microsoft Excel and Statistical Program for Social Science (SPSS) software were used. According to the normality of the data distribution assessed by the Kolmogorov-Smirnov test, categorical data are shown as frequencies and percentages, while numerical data are displayed as the mean or median. The Chi-Square Test was applied while bivariate analysis was utilized to compare the two variables, specifically the link between knowledge and attitude and the association with practices. However, Fisher's test or Kolmogorov-Smirnov test are used as alternatives if it doesn't match the parameters of the Chi-square test.

According to Bloom's cut-off (≥80%), outcomes on KAP were dichotomized, Where the total knowledge score ≥ 80% indicates a good level of knowledge, and conversely if the knowledge score < 80% indicates a poor level of knowledge. As well as the level of knowledge, from the sum of the attitude and practice scores ≥ 80% indicates a positive value and < 80% indicates a negative value for each variable.[23]

This study uses a significance limit of 0.05, therefore the data can be interpreted if the p-value < 0.05 then the results of statistical calculations have a significant value, and if the p-value≥ 0.05 then the results of statistical calculations are considered not significant.

Ethical Approval

The Health Research Ethics Committee of the Faculty of Medicine, University of Indonesia, and Cipto Mangunkusumo Hospital gave their approval to all of the procedures used in this study, and these organizations were given the following license numbers for their approval:1129/UN2.F1/ETIK/PPM.00.02/2022

RESULTS

Respondent's Characteristics

According to the characteristics of the respondents in this survey, the respondents are in the 20–25 age range, with a median age of 22. Approximately 65.7% of responders were female. As many as 94.4% of the respondents in this study are from the island of Java. Respondents from the Regular Class made up 73.7% of the sample and those from the International Class made up 26.3%. The distribution of the respondents' sociodemographic details is shown in Table 1.

Table 1. Characteristics of respondents involved in this study

Variable	Median (Min-Max)	n=213	%
Age	22(20-25)		
Gender			
Male		73	34.3
Female		140	65.7
Domicile			

Java	201	94.4
Outside Java	12	5.6
Class		
Regular	157	73.7
International	56	26.3

Knowledge, Attitude, and Practice toward COVID-19

According to the findings of this study, in Table 2 respondents have a high level of knowledge about the COVID-19 infection (73.7%), a positive attitude toward it (96.2%), and positive practice (83.6%).

Table 2. The Distribution of respondents' knowledge, attitudes, and practice levels toward COVID-19 Infection

Variable	Category	n=213	%
Knowledge	Good	157	73.7
	Poor	56	26.3
Attitude	Positive	205	96.2
	Negative	8	3.8
Practice	Positive	178	83.6
	Negative	35	16.4

The COVID-19 knowledge of medical students

Based on Table 3, it can be seen that respondents who know the definition category of COVID-19 with the question item which stands for Coronavirus Disease-2019, all respondents answered correctly. However, in the question items, which are a group of related viruses that cause disease in mammals and birds, only 55.9% answered correctly. In the question of knowledge of the COVID-19 epidemiology category with question items since March 2020 the Government of the Republic of Indonesia has established a PSBB, Most of the respondents answered correctly as many as 186 respondents (87.3%). In the COVID-19 pathophysiology category with the question items infection is faster and more severe for people with a weak immune system (elderly/progressive disease) all respondents answered correctly. Likewise regarding the category of clinical manifestations of COVID-19 with the question item Infection can cause mild, moderate, or severe symptoms, all respondents answered correctly. Meanwhile, in the symptom question item, most of the COVID-19 patients had a good prognosis, a small number of critical conditions, and died as many as 88.7% answered correctly. In the knowledge question in the COVID-19 diagnosis category with question items *Pasien Dalam Pengawasan* (PDP) characteristics: fever > 38ºC, cough/runny nose, sore throat mild to severe pneumonia based on clinical radiological picture having a history of travel to China/infected country, the majority of respondents (94. 8%) answered correctly. Likewise for questions in the COVID-19 management category with the question item confirmed (+) patients without symptoms and mild symptoms, isolated at home for 14 days, almost all respondents (99.5%) answered correctly.

Table 3. Detailed responses of respondents' correct answers toward knowledge of COVID-19

Knowledge items	n=213	%
Definition of COVID-19		
It stands for Coronavirus Disease-2019	213*	100
It is an infectious disease that was discovered in Wuhan in late 2019	213*	100
It is a viral respiratory infection that can kill humans	204	95.8
Is a group of related viruses that cause disease in mammals and birds	119	55.9
Epidemiology of COVID-19		
Since March 2020 the Government of Indonesia has established PSBB	186	87.3
The spread of infection often occurs in winter, and spring, and is related to climatic factors and travel or movement	122**	57.3
Pathophysiology of COVID-19		
Infection is more rapid and more severe in people with weak immune systems (elderly/progressive disease)	213	100
COVID-19 Clinical Manifestations		

Infection can cause mild, moderate, or severe symptoms	213	100
The main clinical symptoms are fever (temperature > 38ºC), cough, difficulty breathing, accompanied by severe shortness of breath	205	96.2
Symptoms that appear in some COVID-19 patients are mild, not even accompanied by fever	195	91.5
Most of the symptoms of COVID-19 patients have a good prognosis, a small number are in critical condition and have died	189	88.7
Diagnosis of COVID-19		
Characteristics of *Pasien dalam Pengawasan* (PDP) (B): fever > 38ºC, cough/runny nose, sore throat mild to severe pneumonia based on clinical radiological picture has a history of travel to China/infected countries	202	94.8
Orang Dalam Pemantauan (ODP) characteristics (B): has fever symptoms or a history of fever without pneumonia, has a history of travel to China or infected regions/countries	187	87.8
Management of COVID-19		
The patient was confirmed positive with no symptoms and mild symptoms, isolated at home for 14 days	212	99.5
Patients confirmed positive for moderate and severe symptoms were isolated at the Referral Hospital	208	97.7

*Notes: *Question with the most correct answers,*
***Question with the least correct answers*

The attitudes of medical students toward COVID-19

According to the results of the study in Table 4, of the 15 questions presented, most of the respondents answered with positive answers on several question items to prevent COVID-19 infection. In the question item for preventing COVID-19 infection, all respondents are required to keep their distance (social distancing) with an answer in the positive category, as well as The question item to improve the body's immune system should carry out activities required to wash hands with antiseptic soap and running water every people who have just finished carrying out activities, as well as the question items to avoid COVID-19 infection should clean and disinfect regularly, almost all answered in the positive category, namely as much as 92%.

Table 4. The positive attitude of respondents about COVID-19

Attitude items	n=213	%
To prevent COVID-19 infection, social distancing is required	213*	100
To improve the body's immune system, regular exercise should be done	213*	100
To prevent COVID-19 infection, it is mandatory to wear a mask when leaving the house	212	99.5
To prevent COVID-19 infection, it is mandatory to wash hands with antiseptic soap and running water for everyone who has just finished carrying out activities	212	99.5
When you are unwell or have mild flu symptoms, you should wear a mask and stay at home while taking medicine	212	99.5
To avoid humidity in every room in the house, you should improve air circulation and light	212	99.5
When outside the home, you should avoid public places with dense populations and poor air circulation	212	99.5
To avoid being infected with COVID-19, when carrying out activities as much as possible avoid touching your eyes, nose, and mouth	211	99
To avoid being infected with COVID-19, it is mandatory to avoid contact with people who are sick	211	99
When coughing, or sneezing, you must cover your mouth and nose with a tissue or your shoulder	210	98.5
To improve the body's immune system you should consume fruits rich in vitamin C every day	210	98.5

To improve the body's immune system should bask in the morning sun every day	201	94.3
When traveling by Bus, Train, or Aircraft, you are required to first do a Rapid Test or Polymerase Chain Reaction (PCR) swab	201	94.3
To avoid COVID-19 infection, you should clean and disinfect regularly surfaces and objects that are frequently touched at home	200	93.8
While at the animal market, avoid contact with livestock or wild animals without protection	196**	92

*Notes: *Statements with the most positive attitude,*
***Statements with the least positive attitude*

Medical students' practices toward COVID-19

Based on Table 5, it can be seen from the 15 question items toward practices in preventing COVID-19 infection, in the question items when traveling using private vehicle facilities or using public transportation facilities, always using a mask and social distancing, all respondents answered in the positive category. In contrast to the question items related to carrying out regular sports activities to improve the immune system, only 61.9% answered in the positive category.

Table 5. The positive practice of respondents toward COVID-19

Practice items	n=213	%
When traveling using private vehicle facilities or using public transportation facilities, I always use a mask and social distancing	213*	100
I always obey and implement health protocols every time I leave the house	212	99.5
I maintain cleanliness in myself, my family, and the house where I live	211	99
When I cough or sneeze, I always cover my mouth with a tissue or my shoulder	207	97.1
Every time I'm outside the house, I always avoid public places with dense populations and bad air circulation	205	96.2
If the mask I use starts to feel damp and smells bad, I immediately replace it with a new mask	202	94.8
I always avoid contact and social distancing	201	94.3
When my body feels unwell, I stay at home while taking the medicine	200	93.8
When I shop at the market, I always avoid direct contact with farm animals without protection	192	90.1
I reduce going to crowded places unless it is mandatory to attend.	189	88.7
When using a mask, I always avoid touching the front of the mask.	189	88.7
To avoid humidity, every day I always pay attention to air circulation and sufficient light in every room in the house	182	85.4
I take vitamin C tablets and eat vitamin C-rich fruits regularly	160	75.1
I clean and disinfect frequently touched surfaces and objects in the house	153	71.8
I do sports activities regularly to improve my immune system	132**	61.9

*Notes: *The statement with the most positive practice,*
***Statements with the least positive practice*

Related KAP toward COVID-19

Table 6 in this study's findings shows that, of the 157 respondents with a good degree of knowledge, 97.5% of them had a positive attitude about infection with COVID-19 infection. 92.9% of respondents had a positive attitude in addition to the 56 respondents with inadequate knowledge. The Fisher's Exact Test was used in statistical calculations after it was determined from the Chi-square test results that 1 cell (> 25%) had an expected count of less than 5. The Fisher's Exact Test results showed a p-value of 0.211 ($p \geq 0.05$), indicating that there was no statistically significant correlation between knowledge and attitude toward the COVID-19 infection. In addition, the odds ratio value is 2.942 (95% CI, 0.710-12.187).

Meanwhile, Table 4 shows that, of respondents with a good level of knowledge, 86.6% of respondents had positive practice, and the rest had negative practice. Of the respondents who have a poor level of knowledge, 75% of respondents have a positive practice level. Chi-square test findings showed a p-value of 0.044 ($p<0.05$). This indicates that there is a substantial correlation between knowledge and practice about COVID-19 infection, with an odds ratio of 2.159 (95% CI, 1.010-4.614)

Table 6. Relationship between Knowledge, Attitudes, and Practice Respondents toward COVID-19 Infection

Variable	Category	Knowledge			p-value	OR	95% CI
		Poor (n = 56)	Good (n = 157)	Total (n = 213)			
		n (%)	n (%)	n (%)			
Attitude	Negative	4 (7.1)	4 (2.5)	8 (3.8)	0.211	2.942	
	Positive	52 (92.9)	153 (97.5)	205 (96.2)			(0.710-12.187)
Practice	Negative	14 (25)	21 (13.4)	35 (16.4)	0.044	2.159	
	Positive	42 (75)	136 (86.6)	178 (83.6)			(10.10-4.614)

Notes: OR = Odds Ratio, CI = Confidence Interval

DISCUSSION

Health workers have an important role in efforts to improve public health status. In addition to providing care and treatment, health workers must also be able to provide adequate education to the public. Medical students are one of the health workers who will participate in a line of health facilities. They play an important role in providing education to increase awareness of disease prevention, reduce risks, and support disease prevention measures in the community.[24] Medical students can become agents of change in the COVID-19 pandemic. Thus they can exert a good influence and change the perceptions of their friends and family because medical students are considered a reliable source of health information.[17] This study showed that most students had a good level of knowledge (73.3%), positive attitude (96.2%), and positive practice (83.6%). This study is comparable to earlier studies conducted in Ethiopia.[25] In the knowledge level category, most of the respondents had good knowledge about COVID-19 infection. Shown by The respondents answered correctly in several categories of questions, namely regarding definition (100%), pathophysiology (100%), clinical manifestations (100%), and aspects of management (99.5%). This can illustrate that with a good level of knowledge about COVID-19, effective health education has been delivered properly through formal education, and informal education.[26]

Regarding attitudes towards COVID-19, the results showed that the majority of respondents (96.2%) had a positive attitude towards COVID-19 infection. In line with research conducted on medical students in East Java, the majority of respondents (81%) had a good attitude towards COVID-19 infection. Attitudes are formed from experience gained through the learning process to increase individual knowledge. Besides that one's attitude is obtained from interactions with personal experience, influence from other people who are considered important, social culture, mass media, education, and emotional influences. Attitudes related to the prevention of COVID-19 are about how a person has awareness of situations, emergencies, and education regarding the transmission of COVID-19 because attitudes are one of the important aspects that need attention in efforts to prevent and handle cases of infection with COVID-19.[27]

Regarding practice toward COVID-19 infection, the majority (83.6%) of respondents have shown positive practice in preventing COVID-19 infection, namely by using masks, practicing social distancing, washing hands with soap, and following other health protocols, following other studies.[28] More than half (61.9%) of respondents do sports activities regularly to improve the immune system. Even though according to studies, exercise has been proven to increase the body's immunity to prevent COVID-19.[29]

This study also analyzed the relationship between the level of knowledge and attitudes of students toward COVID-19 infection. Based on the Fisher's Exact Test statistical test, it was found that the significance of p-value = 0.211 ($p > 0.05$) which was considered statistically insignificant. Therefore it can be concluded that there is no significant relationship between the level of knowledge and attitudes of respondents

toward COVID-19 infection. In the statistical test, it was also found that students who had a poor level of knowledge were 2.942 times at risk of having a negative attitude in preventing COVID-19 infection compared to respondents who had a good level of knowledge. The results of this study were strengthened by KAP research in Ecuador explaining that the majority of respondents believe that greater knowledge about COVID-19 is not enough to change individual attitudes towards COVID-19 prevention.[30] However, these results contradict various studies in Malaysia, which report that adequate knowledge is needed for more positive attitudes and practices in preventing COVID-19 infection.[31] The differences in these findings indicate that attitudes are also related to individual beliefs apart from the education that has been obtained. That is, when someone believes that doing something will have an impact as expected, they tend to take that action.[32]

Likewise, the relationship between the level of KAP is proven by using the Chi-Square Test statistic. From the statistical test, the results obtained were p value = 0.044 ($p < 0.05$), meaning that the results of statistical calculations were considered significant. If it is concluded that there is a significant relationship between the level of knowledge and the level of respondent practice toward COVID-19 infection. In addition, according to the statistical test, OR = 2.159 (95% CI, 1.010-4.614) which means that students with a poor level of knowledge are 2.159 times more likely to have a risk of negative practice in terms of preventing COVID-19 infection compared to students who have good knowledge. In line with KAP research on COVID-19 infection in the Palestinian community, stated that the majority of respondents (81%) had preventive practices against the spread of COVID-19 infection this was associated with adequate knowledge of how COVID-19 is transmitted.[33] Knowledge about COVID-19 infection is one of the important things in efforts to prevent COVID-19 in the current pandemic. Based on the theory put forward by Lawrence Green,[34] knowledge is one of the three factors that can influence a person's practice. Someone who already has a certain knowledge usually tends to have more ability to determine and make the right decision. It is hoped that if someone has good knowledge about COVID-19 infection, it is also directly proportional to good practices to prevent COVID-19.[18] Medical students are students who have gone through various studies in medical science, one of which has learned about COVID-19. With the knowledge that has been obtained and owned by students, of course, they can provide education to the public toward the prevention of COVID-19.

There are various limitations to this study. First of all, as it is only a cross-sectional study, no causal relationship between factors can be drawn, and the Likert scale used for attitude and practice questions may lack granularity, limiting the depth of understanding of respondents' attitudes and behaviors. Furthermore, utilizing self-reported questionnaires to gather data can lead to recall bias and reporting bias, and some questions may be dishonestly answered out of social desirability. In addition, this study did not analyze factors that could influence students' knowledge, attitudes, and behavior towards COVID-19 infection of students who had been infected with COVID-19. Therefore it is hoped that future research can consider confounding variables such as students who have been infected with COVID-19, and factors such as socioeconomic status, prior exposure to health education, and personal experiences with the virus could impact students' KAP, so that they can provide results that can be useful in the future. Last but not least, the sample cannot be generalized; only gathers data from one university. It can't be generalized to include all students.

CONCLUSION

This study concludes that there are most medical students have a good level of knowledge and positive attitudes and behaviors toward COVID-19 infection. There is no significant relationship between the knowledge and attitudes toward COVID-19 infection and there is a significant relationship between the knowledge and practice toward COVID-19 infection. Thus the existence of a KAP study is important to find out the extent of KAP in medical students. Medical students can become agents of change in dealing with the current COVID-19 pandemic by having a good influence and changing the perceptions of their friends and family because medical students are considered reliable sources of health information. In addition, students need to have a good KAP related to COVID-19 to prevent being

infected with COVID-19.

The present outbreak teaches medical institutions a valuable lesson about the importance of creating curricula that equip students to respond favorably to pandemics. A lot of people are losing faith in science as a result of this pandemic, which is a blow to all involved. As a result, the government should create a curriculum for schools that fosters scientific mindsets beginning in elementary school.

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CONFLICTS OF INTEREST

The author declares that the performance or presentation of the work described in this manuscript was not influenced by any substantial conflicting financial, professional, or personal interests.

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