Since 2002

Coronavirus Disease-19: Correlation between Knowledge and Preventive Behavior by Medical Students after One Year of Pandemic and Factors that Affect Knowledge

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Abstract

BACKGROUND: The COVID-19 pandemic, which started in December 2019, is still continuing to date (November 2021), and nobody knows how long it will remain. During this time, the world remains vigilant against the pandemic, causing new problems in various fields of life. At the same time, the public continues getting latest information about COVID-19. One and a half year is not a short time to continuously carry out COVID-19 preventive behavior, which in turn causes relaxation of COVID-19 preventive behavior.

AIM: This study aims to determine the correlation between knowledge and COVID-19 preventive behavior after 1 year of pandemic among medical students and to find out factors that affect knowledge about COVID-19.

METHODS: This is a descriptive-analytic cross-sectional study with 261 respondents collected from students of the Faculty of Medicine, Universitas Sumatera Utara. Respondents' data were collected using an online questionnaire which had been tested for its validity and reliability. Distribution of sample size used proportionate stratified random sampling and simple random sampling. Data will be analyzed using Chi-square.

RESULTS: Of the 261 respondents analyzed, 247 respondents (94.7%) had good level of knowledge, 222 respondents (85.1%) had good level of preventive behavior, and the factors that influenced knowledge were the year of admission (p = 0.028) and family member with past confirmed case of COVID-19 (p = 0.011). The knowledge and preventive behavior relationship analysis showed p = 0.009 (PR = 4.864 [95% CI: 1.587–14.909]).

CONCLUSION: Even though the pandemic has lasted for more than 1 year, medical students with good level of knowledge still carry out good preventive behavior showing a meaningful relationship between knowledge and preventive behavior. Level of knowledge is influenced by the year of admission and family member with past confirmed case of the year of admission and family member with past confirmed case of COVID-19.

Introduction

At the beginning of 2020, the world was shocked by the emergence of a new virus variant in China, precisely from Wuhan, Hubei Province which quickly spread to 190 countries and territories. The source of the infection is thought to have come from a fish market in Wuhan. From December 18 to December 29, 2019, there were five patients who were treated with indications of acute respiratory distress syndrome (ARDS). The first spread of COVID-19 virus in Indonesia itself occurred on March 2, 2020, with two confirmed cases from Jakarta [1]. Indonesia itself has a high number of COVID-19 cases, namely, 4,253,598 confirmed cases with 143,744 deaths (CFR: 3.4%) while reaching 105,911 cases in North Sumateraas of November 23, 2021 [2].

On January 10, 2020, the cause and its genetic code is identified, a new coronavirus [3]. Initially, this disease was given the temporary name 2019 novel coronavirus (2019-nCoV), then, on February 11, 2020, the World Health Organization (WHO) announced Coronavirus Disease (COVID-19) as a new name for the disease with a viral etiology of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-COV-2) [4].

There are many risk factors that ease the contract of COVID-19, such as diabetes mellitus, hypertension, male gender, and active smokers. Chronic liver disease and cancer are also considered as risk factors due to immunosuppression in patients, excessive cytokines, and impaired dendritic maturation [5].

The incubation period for this virus is approximately 3–14 days (median 5 days) with very diverse clinical manifestations. The most common clinical manifestations were fever (98%), followed by cough (76%), shortness of breath (55%), myalgia (44%), sputum (28%), headache (8%), coughing up blood (5%), and diarrhea (3%) [6]. The definitive test for COVID-19 is to use reverse transcription-polymerase chain reaction to extract the SARS-CoV-2 gene.

Medical students are source of information for many, not only for themselves but also for the community they live in. Thus, their participation in sharing the

knowledge about pandemic supports the control of the pandemic [7]. In general, knowledge of information has a strong relationship and affects a person's behavior [8]. A study about medical students and COVID-19 by Alsoghair *et al.* showed that knowledge and preventive behavior toward COVID-19 is weakly positively correlated and statistically significant [9]. Data on the COVID-19 knowledge level around the world might vary. For instance, the majority of respondents, United Arab Emirates medical and health sciences students, in a study by Baniyas were aware of COVID-19 preventive measures, virology of COVID-19, and N-95 mask use. However, also on the same respondents, 76% did not accurately know the routes of transmission of the disease [7]. A study by Taghrir *et al.* revealed that 79.6% of Iranian medical students had high level of knowledge towards COVID-19. In accordance with it, 94.2% of the respondents assessed having high performance level in preventive behavior towards COVID-19 [10]. More education and knowledge about COVID-19 are needed to enhance the probability of controlling the pandemic through increased awareness and improved behavior.

Preventive behavior is continuously carried out by the government and the community in their daily lives. This preventive behavior is considered to be one of the best options to control the ongoing pandemic considering there is no 100% cure yet and vaccines are still being developed by certain pharmaceutical companies [11]. Some behaviors that we can do are wearing a mask, covering the nose when sneezing and coughing, washing hands regularly, avoiding contact with infected patients, and refraining from touching the eyes, nose, and mouth with unwashed hands [12].

The study was conducted after 1 year of the pandemic because 1 year is not a short time to be constantly at home, unable to travel, and continue carrying out health protocols which limited the society in many aspects thus creating a sense of tediousness if carried out for a long time. This is compounded by the uncertainty when the pandemic will end. If at the beginning of the pandemic, everyone can find poor knowledge about COVID-19 and good preventive behavior, so what about after the pandemic has been going on for more than a year?

Based on these considerations, this study was conducted to find out the relationship between knowledge and COVID-19 preventive behavior by medical students, who are expected to become healthcare workers that treat the community in the future and become role models for public, after 1 year of pandemic.

Methods

This is a descriptive-analytic cross-sectional study with 261 respondents collected from students of the Faculty of Medicine, Universitas Sumatera Utara. This study began in March 2021–November 2021. Respondents' data were collected using an online questionnaire which had been tested for its validity and reliability. Distribution of sample size used proportionate stratified random sampling and simple random sampling. Data will be analyzed using Chi-square.

Study population and sampling

The population in this study were students of the Faculty of Medicine, Universitas Sumatera Utara, year of admission 2018, 2019, and 2020 with a total population of 750 students. The study sample was 261 students who were divided equally for each year of admission and selected according to inclusion and exclusion criteria. The inclusion criteria are (1) active students of the Faculty of Medicine, Universitas Sumatera Utara year of admission 2018, 2019, 2020, (2) willing to become study respondents. The exclusion criteria are (1) not understanding the use of Google Forms, (2) having no internet access.

Study tool

Primary data used in this study were collected using questionnaire via Google Form. The researcher distributed the questionnaire link in each class group. For respondents who are willing to become respondents can fill out the questionnaire in the attached form link. After filling in the biodata and consent, the respondent will fill out an online questionnaire consisting of a knowledge questionnaire about COVID-19 and a COVID-19 preventive behavior questionnaire. The questionnaire used was proven to be valid and reliable (r count 0.187 > r table 0.1409 and Cronbach's Alpha 0.770) [11]. The COVID-19 knowledge questionnaire consists of 10 items in the form of true and false. This knowledge questionnaire discusses knowledge about dangers, survival period of the virus outside the human body, transmission, symptoms, prevention, prognosis, and management of COVID-19. If the respondent answers correctly, a score of 1 will be given, while if the answer is incorrect, a score of 0 will be given. Knowledge was labeled good if 8–10 questions were answered correctly, moderate if 6–7 questions, and bad if only 0–5 questions were answered correctly. The COVID- 19 preventive behavior questionnaire consists of 7 questions using Likert scale, namely, always (score 4), almost always (score 3), rarely (score 2), and never (score 1), while negative statements are given the opposite value. This behavior questionnaire discusses COVID-19 prevention behaviors such as washing hands, bathing after traveling, wearing masks, maintaining distance, going to crowded places, and using public transportation. It is classified as good if n = 76–100%, moderate: 56–75%, and bad: 0–55% (n = Respondent score/total score).

Statistical analysis

There are six stages of data processing, respectively editing, coding, entry, cleaning, saving, and analyzing. The data that have been obtained will be entered and processed in a computer program, namely, SPSS (Statistical Package for the Social Sciences) v. 26. The analysis was carried out in a descriptive-analytic manner. Descriptive study to look at the characteristics of the data, such as age, gender, year of admission, grade point average, medical relatives, sources of information, duration of internet access, frequency of reading news, place of residence, part time job, confirmed history of COVID-19, and family member with past confirmed case of COVID-19 shown in the frequency distribution table. Analytical study to find the relationship between knowledge of COVID-19 and preventive behavior, then factors that influence knowledge about COVID-19. Chi-square analysis was used when the expected frequency of the table was above 5 and Fisher's exact test was used if there was data on the expected frequency of the table <5 in at least 20% of the total cells of the table.

Ethical consideration

This study has received ethical clearance from the Medical Ethics Committee, Faculty of Medicine, Universitas Sumatera Utara with approval number 192/UN5.2.1.2.6/SPB/2021. Study respondents have also agreed to participate in this study using Google Forms. Previously, respondents had been given an explanation in advance and asked for their willingness by the researcher.

Results

From the results of data collection, researchers obtained a number of samples that matched the minimum standard, 261 students, consisting of 87 students in each year of admission since 2018–2020, Faculty of Medicine, Universitas Sumatera Utara.

The demographic characteristics of the study sample can be divided into several parts, according to age, gender, year of admission, grade point average, medical relatives, place of residence, confirmed history of COVID-19, and family member with past confirmed case of COVID-19, source of information, duration of internet access, frequency of reading news, and part-time job.

Of the 261 respondents, the dominant age was 20 years (32.2%), female (64.4%), the same percentage for the year of admission (33.3%), GPA 3.51-4 (47.1%), having medical relatives (65.5%), urban place of residence (59.8%), no confirmed history of COVID-19 (85.4%), and family member with past confirmed case of COVID-19 (54.4%). Further information is shown in Table 1.

Table 1: Demographic characteristics of the respondents

Characteristic	Frequency	Total
Age		
18 years	38 (14.6)	261 (100)
19 years	80 (30.6)	
20 years	84 (32.2)	
21 years	54 (20.7)	
22 years	5 (1.9)	
Gender		
Male	93 (35.6)	261 (100)
Female	168 (64.4)	
Year of admission		
2018	87 (33.33)	261 (100)
2019	87 (33.33)	
2020	87 (33.33)	
Grade point average		
<3	19 (7.3)	261 (100)
3–3.5	119 (45.6)	
3.51–4	123 (47.1)	
Medical relatives		
Yes	171 (65.5)	
No	90 (34.5)	261 (100)
Place of residence		
Urban	156 (59.8)	261 (100)
Rural	105 (40.2)	
Confirmed history of COVID-19		
Yes	38 (14.6)	261 (100)
No	223 (85.4)	
Family member with past confirmed case of COVID-19		
Yes	142 (54.4)	261 (100)
No	119 (45.6)	

This study also looked for source of information and part time job of respondents. Of the 261 respondents, the dominant source of information was from social media (88.1%), 6–10 h of internet access per day (44.8%), 0–1× reading news per day (38.3%), and no part time job (80.7%). The total number of respondents on part time jobs is 270. This is because there are several respondents who have 2 or more part time jobs. Further information is shown in Table 2.

Table 2: Characteristic source of information and part time job of respondents

Characteristic	Frequency, n (%)	Total
Source of information		
Social media	230 (88.1)	261 (100)
Television	10 (3.8)	
Newspaper	0 (0)	
Radio	0 (0)	
Parents/sibling	21 (8.1)	
Duration of internet access		
1–5 h/day	60 (23)	261 (100)
6–10 h/day	117 (44.8)	
>10 h/day	84 (32.2)	
Frequency of reading news		
0–1× per day	100 (38.3)	261 (100)
2×per day	68 (26.1)	
>2× per day	93 (35.6)	
Part time job		
None	218 (80.7)	270 (100)
Vlogger	0 (0)	
Private Teacher	16 (5.9)	
Online Bike Taxi	1 (0.4)	
Staff	1 (0.4)	
Investor	11 (4.1)	
Online store	19 (7)	
Another	4 (1.5)	

Of the 261 respondents, there are 247 respondents (94.7%) having good knowledge about COVID-19, 10 (3.8%) respondents for moderate knowledge, and 4 (1.5%) respondents having bad knowledge level on COVID-19. There were 108 respondents (41.4%) who managed to answer all the questions of the knowledge questionnaire perfectly (Table 3).

Table 3: Knowledge levels regarding COVID-19

Knowledge about COVID-19	Frequency, n (%)
Good	247 (94.7)
Moderate	10 (3.8)
Bad	4 (1.5)
Total	261 (100)

Of the total respondents, 222 respondents (85.1%) have good COVID-19 preventive behavior even though it has been more than 1 year of the pandemic. There are 39 respondents (14.9%) who have moderate level of preventive behavior, and none for bad level of preventive behavior (0%). Respondents with 22–28 points on COVID-19 preventive behavior questionnaire were marked as having good level of COVID-19 preventive behavior. The points are 16–21 and 7–15 for moderate and bad level of preventive behavior respectively (Table 4).

Table 4: COVID-19 prevention behavior levels

COVID-19 preventive behavior	Frequency, n (%)
Good	222 (85.1)
Moderate	39 (14.9)
Bad	0 (0)
Total	261 (100)

The correlation of knowledge about COVID-19 and its preventive behavior by students of the Faculty of Medicine, Universitas Sumatra Utara, can be obtained using IBM SPSS statistic software by Chi-square analysis if the expected count data cells are above 5, or Fisher's exact test if there is data in at least 20% of total table cells which is below 5, seen on the expected frequency table. The 2 × 3 cross tabulation table explain knowledge about COVID-19 and preventive behavior is shown in Table 5.

Table 5: Knowledge and COVID-19 preventive behavior

Knowledge about COVID-19	COVID-19 preventive behavior		Total, n (%)
	Good, n (%)	Moderate, n (%)	
Good	214 (82)	33 (12.7)	247 (94.7)
Moderate	5 (1.9)	5 (1.9)	10 (3.8)
Bad	3 (1.1)	1 (0.4)	4 (1.5)
Total	222 (85)	39 (15)	261 (100)

This is because three cells (50%) in Table 5 have an expected count of <5, so it needs to be converted into a 2 × 2 table in Table 6 to meet the requirements for using the Chi-square and fisher's exact test. The correlation between knowledge about COVID-19 and its preventive behavior can be seen from the p-value in Table 6.

Table 6: Correlation between knowledge and behavior levels of COVID-19 prevention

Knowledge about COVID-19	COVID-19 preventive behavior			p-value	PR	95% CI
	Good n (%)	Moderate-Bad, n (%)	Total, n (%)			
Good	214 (82)	33 (12.7)	247 (94.7)	0.009	4.864	1.587–14.909
Moderate-Bad	8 (3)	6 (2.3)	14 (5.3)			
Total	222 (85)	39 (15)	261 (100)			

It is said to be meaningful if the p < 0.05. It can be concluded that the p-value of this study is <0.05, with p = 0.009 means there is a significant relationship between knowledge and COVID-19 preventive behavior by students of the Faculty of Medicine, Universitas Sumatera Utara, after a year of pandemic.

This means that someone with good knowledge of COVID-19 is 4.864 times more likely to have good COVID-19 preventive behavior compared to someone with moderately-bad knowledge of COVID-19 with 95% confidence interval between 1.587 and 14.909 (Table 6).

Researchers also looked for any factors (independent variable) that influenced respondents' knowledge about COVID-19 (dependent variable). These factors included age, gender, year of admission, grade point average, part time job, medical relatives, sources of information, duration of internet access, frequency of reading news, place of residence, confirmed history of COVID-19, and family member with past confirmed case of COVID-19.

From Table 7, it can be concluded that there are two factors influence the knowledge about COVID-19 and there are ten factors that did not affect knowledge about COVID-19. Factors which influence knowledge are year of admission (p = 0.028) and family member with past confirmed case of COVID-19 (p = 0.011). Furthermore, the factors that do not affect knowledge are age (p = 0.070), gender (p = 0.376), grade point average (p = 0.568), part time job (p = 0.168), medical relatives (p = 0.436), source of information (p = 0.618), duration of internet access (p = 0.688), frequency of reading news (p = 0.105), place of residence (p = 0.523), and also confirmed history of COVID-19 (p = 0.367).

Table 7: Factors associated with knowledge about COVID-19

Independent variable	Dependent variable	p-value	Interpretation
Age		0.070	No association
Gender		0.376	No association
Year of admission		0.028	Association
Grade point average		0.568	No association
Part time job		0.168	No association
Medical relatives		0.436	No association
Sources of information		0.618	No association
Duration of internet access		0.688	No association
Frequency of reading news		0.105	No association
Place of residence		0.523	No association
Confirmed history of COVID-19	Knowledge about COVID-19	0.367	No association
Family member with past confirmed case of COVID-19		0.011	Association

In contrast to other factors, the year of admission has a significant association with knowledge about COVID-19 with a p = 0.028. The data obtained show that the 2018 has nine respondents (3.44% of the total respondents) with moderate-bad knowledge about COVID-19, while the 2019 only has four respondents (1.53% of the total respondents) and the 2020 has one respondent (0.38% of total respondents) with moderate-bad knowledge of COVID-19. Family member with past confirmed case of COVID-19 has a p = 0.011 which indicates a significant relationship with knowledge about COVID-19.

Figure 1 shows that respondents who have family member with past confirmed case of COVID-19 with a moderate-bad level of knowledge are three respondents (1.1%) while respondents who do not have family member with past confirmed case of COVID-19 with a moderate-poor level of knowledge are 11 (4.2%). It can be concluded that respondents with family

member with past confirmed case of COVID-19 have better knowledge than respondents who do not have. Further information is shown in Figure 1.
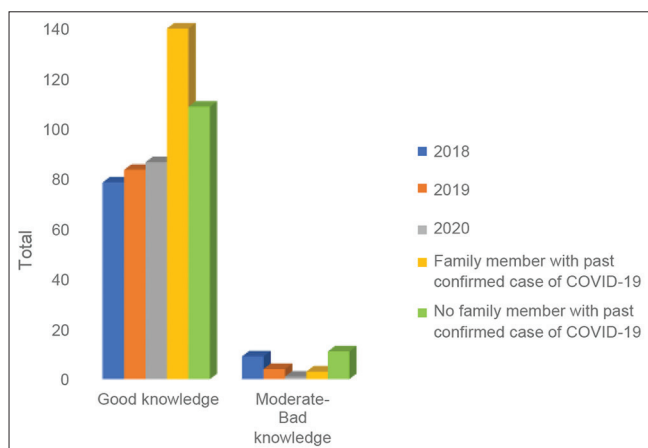

Figure 1: Total respondent with year of admission and family member with past confirmed case of COVID-19

Discussion

Until October 2021, COVID-19 is still a big problem in the world, especially in Indonesia. When COVID-19 started in December 2019, knowledge about the coronavirus was still evolving. If the knowledge possessed is quite good, especially medical students who study various mechanisms and pathogenesis of disease, it is hoped that the preventive behavior carried out will also be better than people with poor knowledge levels. Moreover, it has been more than 1 year since the COVID-19 pandemic hit the world, it is estimated that knowledge and behavior regarding COVID-19 are much better than when the pandemic began.

This study shows that 247 respondents (94.7%) had good knowledge about COVID-19. This shows that people now have good knowledge about COVID-19. This result is in accordance with Limbong's study on undergraduate students from all faculties of Universitas Padjadjaran in 2017–2019 and Al-Hanawi's study to the public in the Kingdom of Saudi Arabia [13], [14]. This result is influenced by good government education through social media, television, radio, or newspapers. The government continues to promote facts about COVID-19 and eradicate hoaxes that can cause wrong perceptions in the community. In addition, the public has also continuously heard the latest information about COVID-19 for more than 1 year, thus causing a sense of vigilance and increasing knowledge and preventive behavior. Kumbeni in Northern Ghana conducted research among pregnant women showing good knowledge about COVID-19 is influenced by education at least a primary education, residing in an urban area, and receiving COVID-19 education at health facilities, while good COVID-19 preventive behavior is influenced

by older age, having at least primary education, pregnant women with chronic disease, and living in urban areas [15].

In Carvalho's cross-sectional study with resident Cape-Verdean population, the knowledge is also followed by good preventive behavior such as staying at home, and having not attended parties [16]. This is certainly very good to be applied in everyday life considering that COVID-19 is still a threat to the world and coronavirus mutations are still happening. Arslanca's research shows that medical specialists have good knowledge, and nurses have good preventive behavior [17]. Another result obtained by Rahman with internet users in Bangladesh showing good COVID-19 preventive behavior is dominantly carried out by people aged 30 and above [18].

COVID-19 preventive behavior is very important because of the high number of COVID-19 cases in the world, especially in Indonesia. Preventive behavior can be carried out through implementing health protocols that are very important to avoid coronavirus infection. Preventive behavior is considered important considering COVID-19 has hit the world for more than 1 year and it is not a short duration to continuously implement health protocol in everyday life. Of course, most people will be bored with the "new normal" life that forces them to make many changes to their daily habits.

However, the rarely implemented COVID-19 preventive behavior is having to always maintain a distance of 1.5 m when in crowds, and being able to regularly exercise or eat nutritious food. This preventive behavior is important to be done considering the spread of coronavirus through droplets. Sari shows that exercise and eat nutritious food will increase endurance to reduce susceptibility towards COVID-19 [19].

University students are the next generation who will build the world, so it is hoped that good behavior must be implemented and they become role models for the surrounding community. University students have good knowledge about COVID-19 but COVID-19 preventive behavior needs to be improved. University students are included in the category of teenagers who have desire to continue socialize with their friends. Wadood's study with Rajshahi University students does not hesitate to use public transport and travel to public places with friends. The majority of university students think that the pandemic cannot interfere with their activities and feel that there is no significant change in the learning process [20]. Another significant predictor of COVID-19 infection is mask wearing among university students. Mask was dominantly associated with a reduced risk of COVID-19 infection compared to those who not wearing a mask [21].

According Prasad Singh's research, more than 70% respondents in Indian Institute of Health Management Research students have good knowledge about COVID-19 symptoms, transmission and

prevention of COVID-19, and only 66% have good knowledge about COVID-19 treatment. Almost all students follow the government's recommendations regarding the prevention of COVID-19. The latest information about COVID-19 is dominantly obtained from social media (83%) and television (77%). This shows that this age has become the era of technology so that the dissemination of information becomes faster and more digitally [22].

This study found a relationship between knowledge about COVID-19 and preventive behavior after 1 year of pandemic with p = 0.009, PR value = 4.864, and 95% CI = 1.587–14.909. Respondents with good knowledge will be 4.864 times more likely to perform good preventive behavior than those with poor knowledge. This result may also be influenced by the study respondents who were medical students. Another possible factor is that the majority of respondents (65.5%) had medical relatives who worked every day to deal with COVID-19 sustaining awareness that COVID-19 is still a threat for the world.

The factor that influences knowledge in this study is the year of admission and family members with past confirmed cases of COVID-19. Knowledge about COVID-19 in medical student class 2018 is lower than in class 2019 or 2020. This is probably due to the desire to seek information about COVID-19 which is higher in class 2019 and class 2020. The class 2018 has been medical student for 3 years, causing the desire to read details about COVID-19 is lower than the class 2019 and 2020 who are newer medical students. Family members with past confirmed cases of COVID-19 also affect knowledge about COVID-19 with a p = 0.011 which indicates a significant association with knowledge about COVID-19. This is probably because when the family member is confirmed to have COVID-19, the respondent who is in good health might help in the treatment of the sick family member. Moreover, the respondents are medical students who have learned more about the treatment of COVID-19 so there is a desire to put the knowledge they have learned into the real event for the recovery of their families who have been confirmed COVID-19.

There are several causes that can cause other independent factors (age, gender, grade point average, part time job, medical relatives, sources of information, duration of internet access, frequency of reading news, place of residence, and confirmed history of COVID-19) to be not significant to knowledge of COVID-19. One of the reasons is that the education carried out by the government is quite good, so that basic knowledge about COVID-19 is known by the public. The government continues to provide education about the meaning, transmission, symptoms, what can and cannot be done, and much more. This causes everyone (whether men or women, lives in urban or rural areas, or who has medical relatives or not) have good knowledge about COVID-19 preventive behavior. Social media also plays an important role. Respondents are in the range of

18–22 years, so they are active in social media. Social media can provide a lot of up-to-date information about the update of COVID-19, so the knowledge becomes better. The age range of 18–22 years also causes the same category: teenagers, so that the level of knowledge and daily behavior is in the same category. Another cause is the education of respondents who are medical students, so they understand more about the mechanism and treatment of a disease and make it an added value for the public.

Medical students should have better knowledge about COVID-19 and keep updating their knowledge. In this study, total of 14 respondents (5.3%) had moderate-bad level of knowledge. This should need to be further improved, especially for medical students that have studied about COVID-19 at university and will become a doctor in the future. It is recommended that more seminars must be held regarding the update of COVID-19 knowledge and keep in mind the importance doing preventive behavior in daily life.

Medical students as academic figures are expected to improve public knowledge about COVID-19 so they can perform better COVID-19 preventive behavior. Medical students also should be a good role models and have a lot of influence on the community to carry out better COVID-19 preventive behavior.

We must remember that the pandemic that has lasted more than 1 year can cause relaxation of preventive behavior. Policy makers need to find new policies and strict regulation so that COVID-19 preventive behavior can still be implemented in everyday life. Even though it has been more than a year of the pandemic, the pandemic is still not over. There are still many mutations and all the problems that occur in society. It is important to keep updating knowledge about COVID-19 and make sure general public keep doing preventive behavior in daily life.

This research is still limited to the respondents that are only students from the Faculty of Medicine, Universitas Sumatera Utara. Preferably, respondents can be taken from various medical faculties in Indonesia, even in all countries in the world in order to represent more realistic results. Another limitation is that data collection used online questionnaires. This can result in respondents being able to look for additional information that they do not know on the internet when working on the questionnaire. However, considering the COVID-19 pandemic is still sweeping the world, this method is still chosen compared to other methods.

Conclusion

This study shows that there is a correlation between knowledge about COVID-19 and preventive

behavior by students of the medical faculty, Universitas Sumatera Utara. Factors that influence knowledge are year of admission and family members with past confirmed case of COVID-19. Nevertheless, knowledge of COVID-19 will continue to grow, so it is hoped that the development of COVID-19 will continue to be studied and good preventive behavior be carried out in daily activities.

A medical student is a figure who is admired and has more value in society. Therefore, it is hoped that medical students will continue to update knowledge about COVID-19 and become a role model for the community in implementing COVID-19 preventive behavior in daily life. Policy makers should continue to actively educate the public and not be bored to carry out health protocols in daily life.

Acknowledgment

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