
Respondent Characteristics and Student Health Knowledge About Covid-19

**Fitriani Kahar¹, Widarti², Ririh Jatmi
Wikandari³**

^{1,3} Politeknik Kesehatan Kemenkes Semarang

³ Politeknik Kesehatan Kemenkes Makassar

¹ fitriani kahar888@gmail.com

Received: 22-March-2022

Revised: 12-May-2022

Accepted: 25-May-2022

Abstract

Introduction: COVID-19 is not over yet. Prevention of COVID-19 is still being carried out and the emphasis is on increasing knowledge of health students so that they are expected to influence positive attitudes and behaviours to prevent COVID-19 in health students. The purpose of this study was to see the relationship between individual characteristics and knowledge about COVID-19, especially for health students on campus because the campus community is a community that can contribute to preventing the transmission of COVID-19 through breaking the chain of transmission of COVID-19.

Objectives: This article aims to determine the sociodemographic characteristics of students related to students' knowledge about COVID-19.

Methods: This type of research is a type of quantitative research with a cross sectional design. The number of samples was 323 health students at Poltekkes Kemenkes Semarang Health Analyst Department which was determined by saturated sampling technique. The method of data collection was done through an online questionnaire technique and assisted by the google form program. Data analysis using univariate test and bivariate test (Continuity Correction) to determine the relationship between respondent characteristics and student knowledge.

Results: The results of statistical tests with Continuity Correction values successively from gender, age, education level and history of COVID-19 are 0.723, 0.417, 0.084 and 1.00 which indicate a value of > 0.05 so it can be concluded that the student characteristics have no relationship with the level of student knowledge related to COVID-19. The benefit of the results of this study is that it can measure student knowledge and see the relationship between respondents' characteristics and students' level of knowledge.

Conclusions: The results of the study have implications for the application of appropriate types of counselling or socialization activities to be applied to health students, for example education using booklets or videos. Although the results of the knowledge category obtained are high, it is important to continue to carry out education and health promotion programs as an effort to increase knowledge and support COVID-19 prevention practices.

Keywords: Characteristics of Respondents, Knowledge, Students, COVID-19

1. Introduction

Coronavirus is an RNA type virus with a positive strand with a single chain that is not segmented but encapsulated (1). This virus is a positive single strain RNA virus that infects the respiratory tract, with diagnosis starting from symptoms such as fever, cough and shortness of breath. (2). COVID-19 is a new type of virus that has never been previously identified in humans (3). Symptoms and signs of COVID-19 infection are acute respiratory disorders such as cough, fever and shortness of breath. As for COVID-19 cases with severe symptoms, pneumonia, acute respiratory syndrome, kidney failure, and even death can occur (4).

Indonesia have more specific efforts are currently being made, namely the policy of implementing micro-scale-based Community Activity Restrictions (PPKM Mikro) to the RT/RW level as an effort to suppress the rate of the COVID-19 pandemic. The implementation of Micro PPKM is a mutual cooperation or participatory activity to all levels of society as an effort to overcome and reduce the number of COVID-19

transmissions. This effort is effective in reducing the rate of active cases of COVID-19 (5).

The latest data globally on June 4, 2022, there have been reported cases of COVID-19 globally, which spread to 228 countries. The number of confirmed cases is 534,887,773, 6,319,373 deaths and 505,651,880 recovered patients are reported. The 5 countries with the highest cases are the United States, India, Brazil, France and Germany (6). Meanwhile, the Government of the Republic of Indonesia has reported 6,056,017 people with confirmed COVID-19. There have been 3,123 active cases, and 156,604 reported deaths related to COVID-19 and 5,896,290 patients have recovered from the disease. COVID-19 cases with the highest distribution of 5 provinces are still on the island of Java with the highest distribution of cases in a row being DKI Jakarta, West Java, Central Java, East Java and Banten (7) (8).

The results of previous studies showed that the sociodemographic factors of the trading community such as age, gender and education level of the community were not related to public knowledge about COVID-19 with $p > 0.05$. Other supporting research shows that there is a relationship between public knowledge about public knowledge and adherence to wearing masks to prevent COVID-19 (9). This shows the importance of increasing students' knowledge about COVID-19 so that they become aware and behave well as an effort to prevent COVID-19 because it turns out that knowledge can have a direct effect on a person's behavior. The results of different studies conducted on nursing students about COVID-19 showed that the level of knowledge, attitudes and perceptions of students was less or negative. This shows the importance of government support through policies on educational institutions to increase knowledge and create positive attitudes and perceptions in students about COVID-19 (10).

The campus community is a community that can contribute to preventing the transmission of COVID-19 through breaking the chain of transmission of COVID-19. The campus environment can be a transmission for COVID-19 because it is a place for social interaction to occur. Campus is an educational environment for young people as a gathering place for productive people so that they have the potential to become agents of change and can contribute to controlling COVID-19. In principle, prevention, and control of COVID-19 in the community can be carried out at the individual level or at the community (group) level (4). Campus as an institution with very large members in terms of number, variety and very wide requires a comprehensive prevention effort and reaches all the academic community (11).

Medical Laboratory Technology Health students are individuals who are prospective health workers in the laboratory field who can become role models for the community in implementing health protocols during the COVID-19 pandemic. Based on this, it is important to be able to measure student knowledge about COVID-19 so that student knowledge can be transmitted through educational activities or outreach to the community which will have an impact on increasing public knowledge.

This article aims to determine the sociodemographic characteristics of students related to students' knowledge about COVID-19. This article is expected to be a reference source in providing the most appropriate and most needed education about COVID-19 to students.

2. Objectives

This article aims to determine the sociodemographic characteristics of students related to students' knowledge about COVID-19.

3. Method

This research is a quantitative study about respondent characteristics and student knowledge about COVID-19. This research was conducted by distributing online questionnaires to students to be able to measure the level of knowledge of students. The population in this study were all D3 and D4 students of medical laboratory technology, Department of Health Analyst, Poltekkes Kemenkes Semarang. The sample was selected using the saturated sample method with a total of 323 people. Data collection was carried out through a questionnaire technique, because student learning during the COVID-19 pandemic was online learning, according to government regulations, namely study from home. Measurement of knowledge using

an online questionnaire measuring tool and assisted by the google form program. The knowledge studied was to determine the knowledge of respondents in 3 categories, namely conceptual, factual and procedural knowledge related to COVID-19 disease, both about signs, symptoms, impacts, ways to prevent COVID-19, and modes of transmission.

Data analysis was carried out univariately for descriptive and bivariate (gender, age, education level and COVID-19 history) with continuity correction analysis because the sample exceeded 40 people. The data is entered in the SPSS software program. The knowledge questionnaire consists of 15 questions with correct and incorrect answer choices as measured by the Guttman scale. For positive statements, a score of 1 is given for correct answers and 0 for incorrect answers, and vice versa for negative statements. The validity and reliability of the questionnaire have been tested with Cronbach's Alpha 0.6 so that the questionnaire is considered good

4. Result

Table 1.
 Descriptive Data Characteristics of Respondents

No	Characteristics of Respondent	F	%	Mean±SD
1	Gender			
	1. Female	273	84.5	1.15 ± 0.36
	2. Male	50	15.5	
	Total	323	100	
2	Age			
	1. 16-17 years	8	2.5	2.54 ± 0.54
	2. 18-19 years	132	40.9	
	3. 20-21 years	183	56.7	
	Total	323	100	
3	Level of education			
	1. Diploma	237	73.4	1.27±0.44
	2. Bachelor	86	26.6	
	Total	323	100	
4	History COVID-19			
	1. Yes	51	15.8	1.84±0.36
	2. No	272	84.2	
	Total	323	100	
5	Current Condition			
	1. Cough	4	1.2	6.47±0.92
	2. fever	7	2.2	
	3. Flu	8	2.5	
	4. Dizzy	13	4.0	
	5. Healthy	291	90.1	
	Total	323	100	

Table 1 about the characteristics of student respondents based on gender, age, study program, history of COVID-19 and the current condition of students. Table 1 of the results of descriptive analysis based on student characteristics, it shows that the majority of students are female, namely 273 (84.5%), age 20-21 years 183 (56.7%), DIII TLM level of education 273 (73.4 %), have no history of COVID-19 272 (84.2%), and 291 (90.1%) current conditions of students are in good health.

Table 2.
 Student Knowledge During the COVID-19 Pandemic

Variabel	Frequency (n)	Percentage (%)	Mean±SD
Knowledge			
Enough	54	16.7	57.31±6.64
High	269	83.3	
Total	323	100	

Table 2 shows the categories of student knowledge during the COVID-19 pandemic, namely out of a total of 323 respondents there were respondents in the very sufficient category as many as 54 (16.7%), and in the high category by 269 (83.3%), and no respondents in the low knowledge category. The majority of knowledge in the high category was 269 (83.3%). This shows that students already know important things related to COVID-19 such as signs, symptoms, modes of transmission and methods of prevention. In this case, student knowledge is very relevant to the education level of respondents who come from educational institutions in the health sector.

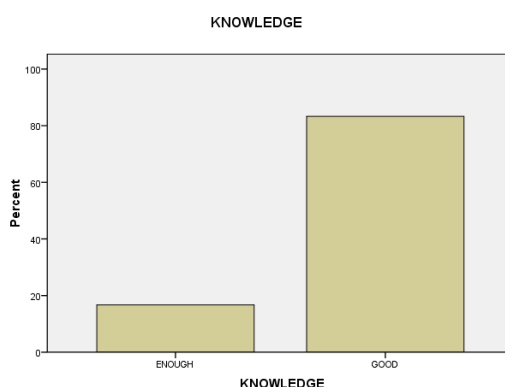


Figure 1 shows the category of student knowledge about COVID-19 with a sufficient category of 16.7% and good 83.3%.

Table 3.

Bivariate Analysis of Cross-Test of Respondent Characteristics with Student Knowledge During the COVID-19 Pandemic

Variabel	Knowledge		Total	P-value
	Enough	High		
Gender				
Famale	47 (14.6)	226(70)	273 (84.5)	0.723
Male	7 (2.2)	43 (13.3)	50 (15.5)	
Age				
16-17 Years	2 (0.6)	6 (1.9)	8 (2.5)	0.417

18-19 Years	18 (5.6)	114 (35.3)	132 (40.8)	
20-21 Years	34 (10.5)	149 (46.1)	183 (56.7)	
Level Of Education				
Diploma	34 (10.5)	203 (62.8)	237 (73.4)	0.084
Bachelor	20 (6.2)	66 (20.4)	88 (26.6)	
History of COVID-19				
Yes	9 (2.8)	42 (13)	51 (15.8)	1
No	45 (13.9)	227 (70.3)	272(84.2)	

Table 3 is a cross-test table for Gender, Age, Education Level, and COVID-19 History with student knowledge. The table above is a cross-test between gender, age, and education level, and disease history on knowledge about COVID-19. In this table there are no respondents with low knowledge categories so the table is not displayed. Based on the gender category, from 323 respondents there were 273 respondents with female gender in the category of 226 people having high knowledge, 47 people having enough knowledge, while there were 50 respondents with male gender in the category there were 43 respondents with high knowledge, and 7 people with high knowledge. enough knowledge.

Based on age category, from 323 respondents there were 8 respondents aged 16-17 years, with high knowledge category as many as 6 people and 2 people with sufficient knowledge. There are 132 respondents aged 18-19 years in the high knowledge category as many as 114 people and the sufficient knowledge category as many as 18 people. There are 183 respondents aged 20-21 years, with the category of 149 respondents having high knowledge, 34 respondents with sufficient knowledge.

Based on the education level category of 323 respondents, there were 237 respondents from the Diploma 3 study program with a high knowledge category of 203, and the moderate category as many as 34 people, while there were 88 respondents from undergraduate study programs, in the category there were 66 respondents with knowledge high, and 20 people with sufficient knowledge.

Based on the COVID-19 history category, out of 323 respondents, there were 51 respondents who had a history of COVID-19, in the high knowledge category as many as 42, and in the sufficient category as many as 9 people, while there were 272 respondents who never had a history of COVID-19, with the category there are 227 respondents with high knowledge, and 45 respondents with sufficient knowledge. The results of statistical tests with Continuity Correction values successively from gender, age, education level and history of COVID-19 are 0.723, 0.417, 0.084 and 1.00 which indicate p value > 0.05 so it can be concluded that student characteristics have no relationship. with the level of student knowledge related to COVID-19.

Table 4

Statement Items Related to Student Knowledge During the COVID-19 Pandemic

KNOWLEDGE ABOUT COVID-19

CONCEPT

1. The disease COVID-19 is caused by a corona virus that originated from the Wuhan animal market in China which is nothing to worry about
2. COVID-19 makes people care about environmental hygiene and health
3. This COVID-19 can spread through direct or indirect contact
4. The emergence of symptoms of COVID-19 is God's destiny that cannot be avoided
5. The government's PPKM program has succeeded in reducing the incidence of COVID-19

FACT

6. Symptoms of COVID-19 are like normal flu and do not cause diarrhea
7. Contact tracing is an attempt to trace contact history with patients who are confirmed positive for Covid 19.
8. Talking to people who can't transmit COVID-19
9. Quarantine efforts for COVID-19 patients are a mandatory step in protecting patients and preventing transmission to the surrounding community
10. Rapid Test and TCM examination is a screening examination of samples of patients or people under supervision

PROCEDURAL

11. The use of herbal medicines such as empon-empon is proven to be able to ward off viruses to treat Covid 19 reactive patients
 12. The transmission of COVID-19 can be prevented simply by using a face shield without a mask, hand sanitation and social restrictions
 13. Frequently washing hands or using hand sanitizer can prevent contracting COVID-19
 14. Regular exercise is enough to avoid COVID-19 disease
 15. Early detection of COVID-19 disease can prevent transmission of COVID-19.
-

Table 4 shows statement items regarding student knowledge about COVID-19 which are categorized based on knowledge categories, namely concepts, facts and procedural.

5. Discussion

Table 1 about the characteristics of respondents with the majority being female (273 (84.5%)), this is in line with research conducted on nursing academy students (14) (15). However, this is different from what was done to students in Bangladesh, namely that there were more male respondents than female respondents (16). Regarding age, the age of respondents is in accordance with the classification of the ministry of health, namely the majority are in the classification of late teens (17-25 years) with an age range of 20-21 years 183 (56.7%). This is in line with research conducted on nursing academy students (12). However, this result is different from the research conducted by Saqlain which showed that the age of the respondents was at the age of 31-40 years (Saqlain *et al.*, 2020).

Table 2 shows the percentage of students' knowledge about COVID-19 which shows that the majority of students have high knowledge about COVID-19, which is 269 (83.3%). The results of this study are in line with research in Iran which shows that student knowledge is in the high category, namely 79.6%. This is also in line with research conducted in Karang Rejo Village which showed that the community had high knowledge about COVID-19, which was 58% (14), Okaviani further stated that the level of knowledge of adolescents about COVID-19 was in the good category with female respondents dominated (15). People with high knowledge will reduce risk factors for COVID-19 (16). The results of this study have conducted a correlation test which shows

there is a significant positive correlation between knowledge and COVID-19 prevention behaviour in students (17). This shows the importance of continuously increasing students' knowledge so that students can apply COVID-19 prevention behaviour in everyday life.

However, this result is different from research conducted on nursing students in Indonesia which shows that the level of public knowledge is still low (10). Likewise, research was conducted at SMPN 13 Pesawaran which showed that students' knowledge, attitudes, and behaviour were in the low category (18). It was concluded that good knowledge will affect the implementation of COVID-19 prevention behaviour. From these results it can be concluded that one of the efforts to solve problems related to COVID-19 is through increasing knowledge.

Table 4 shows statement items regarding student knowledge about COVID-19 which are categorized based on knowledge categories, namely concepts, facts and procedural. Knowledge related to concepts is cognitive knowledge from students about COVID-19, and related to facts is knowledge about the impacts caused by COVID-19, while procedural is public knowledge about how to prevent and transmit COVID-19.

Regarding the prevention of COVID-19 transmission in Item 12, it is stated that the way to prevent the transmission of COVID-19 is to use a face shield without a mask, hand sanitation and social restrictions, and in item 13 about the frequency of hand washing or the use of sanitizers can prevent the occurrence of COVID-19. In fact, masks are very important in order to prevent the COVID-19 pandemic. The use of a face shield without a mask will pose a risk of infection to students because air particles can still enter through breathing if it is not accompanied by a mask, so the use of a face shield must still be accompanied by a mask (19). With a high awareness of the use of masks by everyone, indirectly everyone will be protected from COVID-19. Cloth masks are the first step to protect against COVID-19 (20). So that students are expected to be more selective in choosing masks that are in accordance with local environmental conditions so that they can protect themselves and control themselves against droplets that cause COVID-19 cases.

Regarding item 13, it is stated that the frequency of washing hands or using hand sanitizers can prevent the occurrence of COVID-19. In fact, by always implementing hand washing behaviour and using hand sanitizers, you can prevent the transmission of COVID-19 because the virus that is on your hands has been turned off through the hand washing process, thereby minimizing the risk of transmission. In the COVID-19 prevention manual, it shows the importance of promoting hand washing habits and the use of hand sanitizers for the prevention of COVID-19 (4).

In terms of the information/knowledge needs of the community related to COVID-19, it varies according to their respective backgrounds and occupations (21). Information about COVID-19 can be obtained by students through the internet, television, social media, the ministry of health, WHO and information through peers or from personal experience. (12). According to research in Jordan that the main sources of student knowledge between medical and non-medical colleges are on social media, internet, and television (22). Regarding the source of information, this is confirmed by the results of research on internet users in the city of Semarang which shows that there is a significant relationship between knowledge, attitudes and COVID-19 prevention behaviour in these communities (23). If students get more information about a thing, it will increase their broader knowledge. The education of students with a diploma level is a higher education level, so it shows that the higher the education of students, the more knowledge they will gain. Good knowledge can be supported by acceptance of information circulating and accepted by the public about COVID-19 (24).

In the opinion of the researcher, students' knowledge is categorized as good because they often see news on the internet and television about COVID-19, besides that their education level has reached a high level, thus expanding students' knowledge. The more information received by students, the higher the level of student knowledge, and vice versa. Based on the reality and from the research data with the theory, there are similarities. If someone already knows some information, then he or she will be able to determine and be able to make decisions on how to deal with it. Thus, someone who has received information about COVID-19, will be able to behave towards COVID-19. The knowledge studied is related to concepts, facts and procedures related

to how to prevent COVID-19. This is confirmed by previous research, which states that knowledge is important in continuing aspects of attitude and behaviour because if someone does not have knowledge, then someone will not show real action (24).

Regarding the concept of health beliefs, the results of previous studies show that of the 4 (four) main concepts of the Health Belief model (the concept model of health beliefs) there are three models that have a relationship, namely the Co-COVID-19 prevention behaviour in respondents, namely the perceived susceptibility component with p -value=0.000, the perceived severity component with p -value=0.000, and the perceived benefit component with p -value=0.0002. The component that does not have a relationship with the respondent's COVID-19 prevention behaviour is the perceived barriers component with p -value=0.28 ($p>0.05$) (25).

Table 3 shows a bivariate analysis of respondent characteristics based on gender, age, education level, history of covid-19 with student knowledge during the covid-19 pandemic. This bivariate analysis was carried out with Continuity Correction analysis successively from gender, age, education level and history of COVID-19 were 0.723, 0.417, 0.084 and 1.00 which showed $p>0.05$ so it can be concluded that the student characteristics did not have relationship with the level of student knowledge related to COVID-19.

5.1 Gender and knowledge of COVID-19

Table 3 shows that there is no significant relationship between gender and knowledge with p value = $0.723 > 0.05$. This shows that female and male respondents have a relatively similar level of knowledge. This is supported by research conducted on the community, which shows that gender has no relationship to community participation in efforts to prevent COVID-19 transmission (26). Furthermore, it is stated that gender, age and religion factors in medical students in India do not have a significant effect on the knowledge of these students, although the knowledge score of women is slightly higher than that of men. (27). However, the results are different from the research conducted on nursing students in Indonesia which showed that there was a significant relationship between the knowledge of female students compared to boys, so the attitude of female students was more positive than male (10). Likewise, research conducted in South Kalimantan (28). It was further explained that people with the female gender tend to have better knowledge about preventing COVID-19 when compared to men. This can happen because women have more time to read books or discuss with their environment regarding the prevention of COVID-19.

Knowledge can be influenced by several factors, including experience, level of education, facilities and beliefs. Adolescent boys and girls are certainly not the same to respond to reproductive health problems. They also affect the reception of information about reproductive health. In addition, the trust factor, both in boys and girls is very different (29). Knowledge or cognitive is a very important domain in the formation of one's actions (30). Good knowledge must also be accompanied by good beliefs to synergize knowledge and belief as an effort to realize positive attitudes and appropriate behaviour. (23).

Knowledge that must be possessed properly and correctly by the community including students at this time in minimizing the spread or transmission of COVID-19 includes knowledge about interpretation, triggers, characteristics and indications and methods of transmission & prevention, as well as healing COVID-19 (31). Knowledge and obedience have a positive bond. The term compliance used is a thing that describes behaviour (9).

5.2 Age and knowledge of COVID-19

Table 3 shows that there is no significant relationship between gender and knowledge with p value = $0.417 > 0.05$. This shows that the age of the respondent is not related to the level of student knowledge about COVID-19.

This study shows that there is no relationship between age and public knowledge about COVID-19, this could be because the age group is quite close among the respondents. If classified based on the ministry of health, the respondents are included in the category of teenagers, so that the age of students has no relationship with knowledge about COVID-19. Knowledge scores for the age category 20-21 years were higher than for

other categories. This result is in line with the theory stating that the age factor is not an obstacle to the source of public information about COVID-19 disease (32). These results are also in line with research conducted on medical students in India (27). This is also in line with other research in South Kalimantan regarding the relationship between individual characteristics and knowledge of COVID-19 prevention with p value = 0.386 (28).

However, this result is not in line with the research conducted in Palembang which stated that there was a significant relationship between age and knowledge with a p value of 0.015.(33). This is also not in line with the theory which states that the older a person gets, the higher the knowledge he gets because his mindset and perceptions develop (34).

5.3 Education level and knowledge of COVID-19

Table 3 shows that there is no significant relationship between gender and knowledge with p value = $0.84 > 0.05$. This shows that the level of education of students does not show a significant relationship to student knowledge. This is in line with research conducted on adolescents in Cimahi City showing that there is no relationship between education level and adolescent knowledge about reproductive health. (29). Wulandari also mentioned that education level has no relationship with knowledge about COVID-19 prevention (28). However, different results were obtained from research on students in Indonesia which showed that there was a significant relationship between differences in education level and students' knowledge, attitudes, and behaviour (35). This is also in accordance with research in the city of Malang (36).

The results of this study are also not in line with the theory which states that education is a learning process to improve or develop certain abilities so that educational goals can stand alone. The level of education also determines whether a person is easy to understand the knowledge gained, and in general, the higher a person's education, the better his knowledge will be. (37).

The theory also says that information can increase knowledge. Information can be obtained through formal and non-formal education. Someone who has easy access to information will find it easier to gain knowledge. Advances in technology can also affect people's knowledge about new innovations so as to produce changes or increase knowledge (37). This is what makes students able to have almost the same knowledge between diploma and undergraduate education levels.

According to Notoatmodjo (2010), knowledge or cognitive is a very important domain in the formation of one's actions (30). Public knowledge about COVID-19, including the causes, signs and symptoms, modes of transmission and things that can be done to prevent everyone from being infected, is one of the most important elements in mitigating a pandemic as it is today. Behaviour that is based on good knowledge will certainly give birth to behaviour that is in accordance with the knowledge possessed. However, attitudes and behaviour do not always go hand in hand, because it is very possible that the behaviour shown is not based on awareness or appropriate attitudes but rather pressure or rules that require someone to behave according to expectations. Good knowledge also needs to be supported by good beliefs so that it is necessary to synergize between knowledge and belief to realize appropriate attitudes and behaviour (23).

The type of education also has an impact on students' knowledge, as explained by Kahar (2021) about education through socialization activities (38). Likewise, Yusriani (2020) stated that there was an increase in students' knowledge, attitudes, and practices on how to prevent COVID-19 through video media education (39).

5.4 History Of COVID-19 and knowledge of COVID-19

Table 3 shows that there is no significant relationship between gender and knowledge with p value = $1.00 > 0.05$. This shows that respondents who have a history with those who do not have a history of COVID-19 have almost the same knowledge. This can be seen where there are many students with high knowledge, both survivors and non-survivors of COVID-19. This is supported by research conducted on the Maluku community with a p value = 0.482 which shows that there is no relationship between knowledge with COVID-19 survivors and non-survivors, but there is a significant relationship with behaviour (40).

This can happen because this research was conducted in the city of Semarang, which is the capital of the province of Central Java, so that we can get a lot of information through print media, as well as social media

and many programs from the government, one of which is counselling about COVID-19 with the aim that people gain knowledge and can also spread positive information about COVID-19. This is also in line with research conducted by Meylani, et al (2020), related to the relationship between knowledge, attitudes, and behaviour of rural communities in preventing the spread of COVID-19. The results showed that there was a significant correlation between the knowledge, attitudes, and behaviour of rural communities in preventing COVID-19. The level of knowledge also has a joint effect on people's attitudes and behaviour (41).

Knowledge is one of the most important things to consider in the context of handling COVID-19 cases. Public knowledge, especially in preventing the transmission of the SARS-CoV-2 virus, is very useful in suppressing the transmission of the virus (42). By having good knowledge of something, a person will have the ability to determine and make decisions on how he can deal with it. Society interprets disease in different ways, and symptoms that are accepted as evidence of disease in one society may be ignored in another (40). Students' knowledge of COVID-19, including the causes, signs and symptoms, modes of transmission and things that can be done to prevent everyone from being infected, is one of the most important elements in mitigating a pandemic as it is today. such as counselling, FGD, placing educational advertisements and installing banners/billboards.

It was further stated that, there were several significant changes related to people's behavior during the COVID-19 pandemic. The most prominent thing from the change in community behavior is the disciplined behavior of people wearing masks, maintaining physical distance, and always maintaining hand hygiene (43). During the COVID-19 pandemic, one must also maintain the cleanliness of the house and the surrounding environment in order to avoid several other infectious diseases such as ARI, tuberculosis, and other diseases. (44).

Continuous socialization and health promotion efforts are needed so that changes occur in the cognitive, affective, and psychomotor of the community to prevent COVID-19 (13). In addition, based on the various problem items above, traders still need education or guidance related to COVID-19, especially regarding methods of preventing and transmitting COVID-19 so that they are more aware of the importance of knowledge in the context of preventing the transmission of this virus.

6. Conclusion

Characteristics of respondents who have the majority gender of students with female gender, namely 273 (84.5%), age 20-21 years 183 (56.7%), Level of education diploma 273 (73.4%), no history of COVID -19 272 (84.2%), and 291 (90.1%) the current condition of the students are in good health. From the results of the frequency distribution, it shows that the knowledge of students in the sufficient category is 54 (16.7%), and the high category is 269 (83.3%). So, most of the students' knowledge is in the high category. This means that students' knowledge is categorized as adequate in preventing COVID-19. This study provides results regarding the relationship of respondent characteristics (gender, age, education level, and history of COVID-19) to student knowledge about COVID-19, which shows there is no significant relationship between gender, age, education level, and history of COVID -19 on students' knowledge about COVID-19 with a value of $p > 0.05$, which indicates that to increase knowledge to students, there is no difference in terms of respondent characteristics.

The results of the study have implications for the application of appropriate types of counselling or socialization activities to be carried out on health students. Although the results of the knowledge category obtained are high, continuous socialization and counselling to health students must continue so that their knowledge can be actualized on behaviour in order to avoid the transmission of COVID-19.

Acknowledgement

Thank you to the Head of the Health Analyst Department who has given permission to carry out this research and to the respondent students of the Diploma of Medical Laboratory Technology Study Program and Bachelor of Applied Medical Laboratory Technology who have participated in this research even though it was carried out during a pandemic.

Conflict Of Interest

The authors declares that there is no conflict of interest

Funding Source

Self-Funded

References

- [1]. Wang Z, Qiang W, Ke H. A Handbook of 2019-nCoV Pneumonia Control and Prevention. Hubei Sci Technol Press. 2020;1–108.
- [2]. Kementerian Kesehatan RI. Guidelines for Prevention and Control of Coronavirus Disease (COVID-19) Revision 5. 5th ed. Aziza L, Aqmarina A, Ihsan M, editors. Jakarta: Kementerian Kesehatan RI; 2020. 1–214 p.
- [3]. Kementerian Kesehatan RI. Guidelines for Prevention and Control of Coronavirus Disease (COVID-19) Revision 3. Jakarta: Kemenkes RI Dirjen P2P; 2020. 0–115 p.
- [4]. Kemenkes RI. Guidelines for Prevention and Control of Coronavirus Disease (Covid-19). Aziza L, editor. Jakarta: Kemenkes RI Dirjen P2P; 2020. 0–115 p.
- [5]. Kementerian Kesehatan RI. Micro PPKM Specific Efforts to Suppress the Pandemic Rate [Internet]. Jakarta; 2021. Available from: <https://covid19.go.id/berita/ppkm-mikro-upaya-spesifik-menekan-laju-pandemi>
- [6]. Worldometer. COVID-19 Coronavirus Pandemic [Internet]. <https://www.worldometers.info/coronavirus/>. 2022 [cited 2022 Jun 4]. Available from: <https://www.worldometers.info/coronavirus/>
- [7]. Gugus Tugas Percepatan Penanganan COVID-19 RI. COVID-19 Distribution Map. [Internet]. Covid19.Go.Id. Jakarta: Covid19.Go.Id; 2022 [cited 2022 Jun 4]. Available from: <https://covid19.go.id/peta-sebaran>
- [8]. WHO. Novel Coronavirus 6 Juli 2020 [Internet]. World Health Organization. 2020 [cited 2020 Jul 9]. Available from: <https://www.who.int/indonesia/news/novel-coronavirus>
- [9]. Sari DP, Nabila Sholihah 'Atiqoh. The Relationship Between Public Knowledge And Compliance With The Use Of Masks As An Effort To Prevent Covid-19 In Ngronggah. *Infokes J Ilm Rekam Medis dan Inform Kesehat*. 2020;10(1):52–5.
- [10]. Mundakir M, Efendi F, Susanti IA. Study of Knowledge, Attitude, Anxiety, and Perception of Mental Health Needs Among Nursing Students in Indonesia During COVID- 19. *Indones Nurs J Educ Clin*. 2021;Volume 6,(59).
- [11]. Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat. COVID-19 Alert Campus Handbook. Vol. 1, Directorate of Health Promotion and Community Empowerment. Jakarta: Kementerian Kesehatan RI; 2020.
- [12]. Winarti R, Hartati S. Study of Knowledge of Akper Hermina Manggala Husada Students About Covid 19 and How to Prevent It. *J Ilm Keperawatan Altruistik*. 2020;3(2):1–9.
- [13]. Saqlain M, Munir MM, Rehman SU, Gulzar A, Naz S, Ahmed Z, et al. Knowledge, attitude, practice and perceived barriers among healthcare workers regarding COVID-19: a cross-sectional survey from Pakistan. *J Hosp Infect* [Internet]. 2020;105(3):419–23. Available from: <https://doi.org/10.1016/j.jhin.2020.05.007>
- [14]. Fata UH, Soares HDC. Knowledge, Attitude and Behavior to Prevent the Transmission of COVID-19. *J Keperawatan Silampari*. 2021;5(2):633–40.
- [15]. Oktavianti PM, Sulisnadewi NL., Sipahutar IE. H The relationship between Adolescent Knowledge Levels About COVID-19 and Adolescent Attitudes in Implementing Health Protocols during the COVID-19 Pandemic. *J Gema Keperawatan*. 2021;14(2):67–82.
- [16]. Irawan AA, Tanaya R, Ratana, Kuswana R. Analysis of Risk Status, Knowledge Level and Compliance of Jimbaran Bali Village Community About COVID-19. *J Bul Udayana Mengabdi*. 2020;19(4):444–8.
- [17]. Kahar F. Knowledge and COVID-19 prevention behavior : A case study of medical laboratory technology students in Indonesia. *Int J Health Sci (Qassim)*. 2022;6(3):7428–42.
- [18]. Farich A, Wahyudi WT, Ernita C. Relationship between Knowledge and Attitude with COVID-19 Prevention Behavior in Students at SMPN 13 Pesawaran. *Manuju Malahayati Nurs J*. 2021;3(4):529–37.

-
- [19]. Howard J, Huang A, Li Z, Tufekci Z, Others. Face masks against COVID-19: An evidence review. *Prepr.* 2020;(April):1–8.
- [20]. Davies A, Thompson KA, Giri K, Kafatos G, Walker J, Bennett A. Testing the efficacy of homemade masks: would they protect in an influenza pandemic? *Disaster Med Public Health Prep.* 2013;7(4):413–8.
- [21]. Nurislamingsih R. Knowledge Service about COVID-19 at the Information Institute. *Tik Ilmeu J Ilmu Perpust dan Inf.* 2020;4(1):19.
- [22]. Alzoubi H, Alnawaiseh N, Al-Mnayyis A, Abu-Lubad M, Aqel A, Al-Shagahin H. Covid-19 - Knowledge, attitude, and practice among medical and non-medical university students in Jordan. *J Pure Appl Microbiol.* 2020;14(1):17–24.
- [23]. Alfikrie F, Akbar A, Anggreini YD. Students' Knowledge and Attitudes in Preventing COVID-19. 2021;3(1):1–6.
- [24]. Suryagustina, Wibowo D. Knowledge, Attitudes and Behavior of Covid-19 Patients at the COVID-19 Expansion Hospital of Central Kalimantan Province. *J Kebidanan dan Keperawatan.* 2021;12(1):32–46.
- [25]. Hepilita Y, Handi H, Demang FY, Mariati LH. Health Belief Analysis of Covid-19 Prevention Behavior Models in Health Students. *J Kesehat Terpadu.* 2021;12(2):85–92.
- [26]. Kistan, Sibulo M, Artifasari A. Sociodemographic Relationship with the Level of Community Participation on Preventing the Spread of COVID-19. *Int J Health Sci.* 2022;6(1):449–57.
- [27]. Maheshwari S, Gupta P, Sinha R, Rawat P. Knowledge, attitude, and practice towards coronavirus disease 2019 (COVID-19) among medical students: A cross-sectional study. *J Acute Dis.* 2020;9(3):100–4.
- [28]. Wulandari A, Rahman F, Pujianti N, Sari AR, Laily N, Anggraini L, et al. Relationship between Individual Characteristics and Knowledge about Prevention of Coronavirus Disease 2019 in Communities in South Kalimantan. *J Public Heal [Internet].* 2020;15(1):42. Available from: <https://jurnal.unimus.ac.id/index.php/jkmi>, jkmi@unimus.ac.id
- [29]. Spwp W, Setiowati T. Relationship between Adolescent Characteristics and Adolescent Knowledge of Reproductive Health in Cimahi City. 2015;
- [30]. Notoatmojo S. *Health Behavioral Science.* Jakarta: Rineka Cipta; 2010.
- [31]. Saputra AW, Simbolon I. Relationship between Knowledge Level about COVID-19 and Lockdown Program Compliance to Reduce the Spread of COVID-19 Among Indonesian Adventist University Dormitory Students. *Nutr J.* 2020;4(No. 2):1–7.
- [32]. Nurmala I, Rahman F, Nugroho A, Erlyani N, Anhar V. *Health Promotion.* Surabaya: Airlangga University Press; 2018.
- [33]. Rizki P, Badri A, Rosita Y, Peratiwi D. Analysis of Factors Affecting Public Knowledge About Hyperuricemia Risk Factors. *Syifa' Med.* 2019;XX(X).
- [34]. Budiman, Riyanto A. *Capita Selecta Knowledge and Attitude Questionnaire in Health Research.* Jakarta: Salemba Medika; 2014.
- [35]. Saefi M, Fauzi A, Kristiana E, Adi WC, Muchson M, Setiawan ME, et al. Survey data of COVID-19-related knowledge, attitude, and practices among indonesian undergraduate students. *Data Br [Internet].* 2020;31:105855. Available from: <https://doi.org/10.1016/j.dib.2020.105855>
- [36]. Ivoryanto E, Sidharta B, Illahi R. The Relationship between Community Formal Education Level and Knowledge in the Use of Oral Antibiotics at the Klojen District Pharmacy. *Pharm J Indones.* 2017;2:31–6.
- [37]. Ar-Rasily KO, Puspita KD. Factors Affecting Parents' Knowledge Level About Genetic Disorders That Cause Intellectual Disabilities in Semarang City. *J Kedokt Diponegoro [Internet].* 2016;5(4):9–33. Available from: <http://ejournal-s1.undip.ac.id/index.php/medico>
- [38]. Kahar F, Devi Etivia Purlinda, Djoko Priyatno, Ichsan Hadipranoto, Rachmad Bayu Kuncara. Socialization Of Clean And Healthy Living Behaviors And Screening Of Non-Communicable Diseases In Efforts To Prevent The Pandemic Covid-19. *Int J Community Serv.* 2021;1(1):42–54.
- [39]. Yusriani, Agustina T. Proceedings of Education Through Video Media Increase Knowledge, Attitudes and Actions of Students in Preventing the Transmission of Covid-19. In: *Proceedings of*

- Kopemas Islamic University of Malang, December 7, 2020. Malang: Islamic University of Malang; 2020. p. 532–44.
- [40]. Angi SI, Hutasoit RM, Buntoro IF. Differences in Knowledge Levels, Attitudes and Behaviors towards Covid-19 Prevention Between Survivors and Non Survivors of Covid-19 in Kupang City. *Cendana Med J.* 2022;23(1):120–7.
- [41]. Meylani V, Hernawat D, Hernawan E, Agustian D. The Relationship between Knowledge, Attitudes, and Behavior of Villagers in Preventing the Spread of Covid-19. *Natl Conf PKM Cent Sebel Maret Univ.* 2020;108–12.
- [42]. Law S, Leungc AW, Xua C. Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19 . The COVID-19 resource centre is hosted on Elsevier Connect , the company ' s public news and information. *Int J Infect Dis.* 2020;99(January):156–63.
- [43]. Kahar F, Dirawan GD, Samad S, Qomariyah N, Purlinda DE. The Epidemiology of COVID-19, Attitudes and Behaviors of the Community During the Covid Pandemic in Indonesia. *Int J Innov Sci Res Technol.* 2020;5(8):1681–7.
- [44]. Kahar F, Dirawan GD, Samad S, Qomariah N, Purlinda DE. Relationship Analysis of Physical Environmental Health Conditions With the Event of Upper Respiratory Tract Infection (Uri) Maros District. *Ann Rom Soc Cell Biol* 7735–7745- [Internet]. 2021;25(4):7735–45. Available from: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=7zLmDFMAAAAJ&pagesize=100&citation_for_view=7zLmDFMAAAAJ:9vf0nzSNQJEC