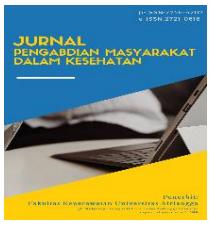

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IMPROVING HIGH SCHOOL STUDENT'S KNOWLEDGE ABOUT COVID-19 AND ITS VACCINATIONS

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ABSTRACT

Introduction: COVID-19 continues to be a global problem. Surabaya is among the cities hit by COVID-19. Lack of information and awareness of COVID-19 and its vaccination in teenagers might have impacted their preventative behavior and belief in COVID-19 vaccination. This study examined differences in high school students' understanding of COVID-19 and its vaccination before and after the intervention.

Methods: The quasi-experimental design was utilized in this study, which took place between September and December of 2021. PowerPoint materials (webinar), videos, and pocketbooks about COVID-19 and its vaccination were the educational community initiatives. Students in grades 10-12 at SMA 4 Muhammadiyah Surabaya, MA Mamba'ul Hisan Gresik, and SMA Negeri 1 Sidoarjo participated in the study, and 160 students completed the pre-test and post-test. The study variables were knowledge, student characteristics (gender, age, class, and school origin), and parental characteristics (age, education, and occupation). The paired t-test was used to evaluate the univariable and bivariable data.

Results: With an average pre-test value of 7.09 and a post-test value of 7.94, there was a difference of high school students' understanding of COVID-19 before and after the intervention ($p < 0.001$). Furthermore, there was also a difference of knowledge about COVID-19 vaccination ($p < 0.001$), with an average pre-test value of 5.87 and a post-test value of 7.03.

Conclusion: There are considerable differences in students' knowledge of COVID-19 disease and its vaccination before and after the intervention. In order to prevent COVID-19, community service activities involving the distribution of information (webinars), videos, and pocketbooks could help them gain more knowledge.

KEYWORDS

COVID-19; knowledge; youth; vaccination.

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1. INTRODUCTION

The Corona Virus Disease 2019 (COVID-19) is a pandemic disease that still becomes a global concern. This disease attacks the human respiratory system caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The COVID-19 spreads relatively quickly and easily through droplets (splashes of saliva) or direct contact with surfaces contaminated with the virus (Zu et al., 2020). The symptoms endured by COVID-19 patients include fever (98% of patients), cough (76% of patients), dyspnea (55% of patients), muscle ache (44% of patients), headache (8%), and diarrhea (3% of patients) (Grace, 2020).

The World Health Organization categorized COVID-19 as a pandemic because daily COVID-19 cases have continuously increased. Indonesia is one of the countries in the world with a high number of COVID-19 cases. The COVID-19 cases in Indonesia reached 4,252,345 people on November 18, 2021, and as many as 143,709 (3.38%) people died (Kemenkes RI, 2021). Surabaya is one of the cities in Indonesia affected by COVID-19, where 66,893 people in Surabaya were infected with COVID-19, and 2,552 (3.82%) people died per November 18, 2021. The COVID-19 cases in Gresik Regency reached 13,464 people, and as many as 727 (5.40%) people died, while in Sidoarjo Regency, as many as 25,204 people were confirmed positive for COVID-19, and 966 (3.83%) people died. (Satgas Covid-19 Jatim, 2021).

The rising number of COVID-19 cases was triggered by people's inability to follow the government's health protocol to avoid further spreading the virus. The health protocol includes wearing masks, washing hands with soap or hand sanitizer, social distancing, and avoiding crowd mobility (PADK Kementerian Kesehatan, 2021). As many as 55.8% of MSME (Micro, Small, and Medium Enterprises) traders in Kutoharjo Square, Kaliwungu, Central Java, did not wear masks and had insufficient knowledge about COVID-19 (Mushidah, 2021). Research conducted at SMA Perguruan Advent Salemba showed that 27.3% of students had moderate knowledge, and 7.3% had insufficient knowledge about COVID-19 (Hutagaol & Wulandari, 2021).

Vaccination became the solution chosen by the government to achieve herd immunity and eradicate COVID-19. During the massive COVID-19 vaccination period, a study conducted at the Marthen Indey Nursing Academy showed that 3% of students possessed insufficient COVID-19 vaccination knowledge, and 23% of students were moderately anxious to get vaccinated (Darwis, 2021). The lack of knowledge and understanding about the benefit and risks of the COVID-19 vaccination became one of the reasons why they did not trust the vaccine in the first place.

Knowledge about COVID-19 becomes important as preventive behavior is vital in determining one's behavior (Darmawan, 2015). Health-related promotional efforts are needed to change people's cognitive, affective, and psychomotor abilities in preventing COVID-19 and getting the vaccine (Saqlain et al., 2020).

Efforts to increase public knowledge need to be carried out through intensive outreach activities to increase understanding of the dangers of COVID-19 and the right way to deal with the disease among youths by participating in the COVID-19 vaccination program. Educational efforts during the COVID-19 pandemic had limitations as people were not allowed to meet each other; thus, innovation related to the use of online educational media was needed. Online education, for example, the use of zoom must be designed and adapted to face-to-face meetings so that the information conveyed could still be well-received by the public (Kirk & Mitchell, 2020).

Education related to COVID-19 and its vaccination has resulted in differences in knowledge between before and after the public has been educated. Especially, vaccination of COVID-19 in Indonesia has also introduced to children with age 12-17 started august 2021. Therefore, we are enrolling high school students in this community service to raise awareness about COVID-19 and the importance of vaccination. This study aimed to analyze differences in high school students' knowledge about COVID-19 and its vaccination before and after the intervention.

2. MATERIAL AND METHODS

This study used the quasi-experimental design conducted in three schools in Surabaya between September and December 2021. It has passed the ethical clearance given by the Ethics Committee of the Faculty of Public Health, Universitas Airlangga.

The participants in this study were students in grades 10-12 at SMA 4 Muhammadiyah Surabaya, MA Mamba'ul Hisan Gresik, and SMA Negeri 1 Sidoarjo. A total of 160 students filled out the pre-test and post-test. Students were asked to fill out a pre-test before they were educated about knowledge of COVID-19 and vaccination, and then the researchers provided them lessons about COVID-19 disease and its vaccination. At the end of the activity, students were asked to fill out a post-test questionnaire independently.

This educational activity through socialization and games was carried out through Zoom Meeting in one day during 3 hours. The lessons provided were about the COVID-19 disease and vaccinations. It was delivered through power points in webinars, videos, and pocketbooks (has been registered in IPR with registration number 000267944 and EC00202143421). Then, we evaluate the score of pre- and post-tests.

In addition to the knowledge about COVID-19 and vaccination, the researchers also measured the characteristics of the students, which included gender (female and male), age (age in years), class (10, 11, and 12), and school origin (three schools). Besides, data on parental characteristics such as age, education, and occupation were also measured in this study. Knowledge about COVID-19 disease and vaccination was obtained from several questions, which results were then added to get a score for each variable. The data were analyzed using univariable and bivariable methods. Bivariable analysis was conducted using a paired t-test to see the increase in knowledge before and after the intervention.

3. RESULTS

From 160 analyzed data, 52.50% of the participating students were 16.37±1.10 years old females of MA Mamba'ul Hisan Gresik (58.13%), and 41.25% of those students were 12th graders. Both fathers and mothers averaged 48.01±7.56 and 44.66 ±7.09 in age, respectively. Most fathers worked as entrepreneurs (35%), and 56.88% of mothers did not have a job. Most of the fathers and mothers had high school education (Table 1).

Table 2 showed that 19 students had been infected with COVID-19 (11.88%). Based on Table 2, only 11.88% of students have experienced COVID-19 with several symptoms, as shown in Table 3.

The symptoms of COVID-19 which is felt by students were more frequently fever (89.47%), cold/flu (89.47%), headache (89.47%) and cough (84.21%). From table 3, it shows that mostly of students experienced COVID-19 had symptoms at least one (89.47%).

Based on Table 4, the average pre-test score of respondents about COVID-19 disease was 7.09, and the post-test was 7.94. From the results of statistical tests, it could be concluded that there was an increase in students' knowledge before and after the intervention ($p < 0.001$). In addition, the average pre-test and post-test scores regarding knowledge about COVID-19 vaccination also increased from 5.87 to 7.03. The statistical test found a difference of students' knowledge about COVID-19 vaccination before and after the intervention ($p < 0.0001$) in the table 5.

4. DISCUSSION

This study showed that 11.88% of respondents had been infected with COVID-19 at least once due to their inability to follow the government's health protocol. A person's behavior was determined by their knowledge level. A person with insufficient knowledge had a greater chance (9.80 times) to ignore appropriate COVID-19 preventive actions (Farich, Wahyudi, & Ernita, 2021). Knowledge is one of the most critical factors in avoiding COVID-19 infection, and proper knowledge can help society make better decisions.

This study showed a significant difference of respondents' knowledge about COVID-19 before and after the intervention ($p < 0.001$). This study was inspired by research done in Bandung, where YouTube and WhatsApp were used as the educational media. Our research also produced videos uploaded to youtube for repeated viewing.

Table 1. Characteristics of Students and Parents

Variables	n	%	Mean	SD
Student characteristics				
Gender				
Male	76	47.50		
Female	84	52.50		
Age			16.37	1.10
School origin				
SMA Muhammadiyah 4 Surabaya	25	15.63		
SMA Negeri 1 Sidoarjo	42	26.25		
MA Mamba'ul Hisan Gresik	93	58.13		
Grade				
10	62	38.75		
11	32	20.00		
12	66	41.25		
Father's characteristics				
Age			48.01	7.56
Job				
Non-worker	3	1.88		
Civil servant/army/police	17	10.63		
Private employee	50	31.25		
Entrepreneur	56	35.00		
Farmer	8	5.00		
Laborer	3	1.88		
Retired	2	1.25		
Health officer	2	1.25		
Teacher	9	5.63		
Other	10	6.25		
Education				
Did not complete elementary school	2	1.25		
Elementary school graduate	13	8.13		
Middle school graduate	10	6.25		
High school graduate	75	46.88		
College graduate	60	37.50		
Mother's Characteristics				
Age			44.66	7.09
Job				
Non-worker	91	56.88		
Civil servant/army/police	2	1.25		
Private employee	26	16.25		
Entrepreneur	22	13.75		
Farmer	3	1.88		
Laborer	4	2.50		
Health Officer	2	1.25		
Teacher	7	4.38		
Others	3	1.88		
Education				
Elementary school graduate	16	10.00		
Middle school graduate	22	13.75		
High school graduate	73	45.63		
College graduate	49	30.63		

Table 2. History of having experienced COVID-19 (n=160)

Variable	N	%
COVID-19 experience		
Yes	19	11.88
No	141	88.13

The study showed that there was an increase in knowledge before and after the intervention was given with an average pre-test score of 6.95 and post-test of 8.23 ($p < 0.001$) (Damara, Nabila, Rainy, Putri, & Ferdian, 2020). This showed that information related to COVID-19 could be accessed through social media such as YouTube and WhatsApp anytime and anywhere. Educational efforts related to COVID-19 using webinars (lectures) and posters also showed the same results, an increase in the average score of pre-test from 59.80 (well educated) to 88.50 in post-test (very well-educated) (Ibrahim et al., 2020). The

Table 3. Symptoms experienced during COVID-19 (n=19)

Variables	N	%
Fever		
Yes	17	89.47
No	2	10.53
Cough		
Yes	16	84.21
No	3	15.79
Muscle ache		
Yes	7	36.84
No	12	63.16
Cold/Flu		
Yes	17	89.47
No	2	10.53
Weak, tired, lethargic		
Yes	14	73.68
No	5	26.32
Difficulty of breathing		
Yes	5	26.32
No	14	73.68
Loss of taste and smell		
Yes	15	78.95
No	4	21.05
Sore throat		
Yes	10	52.63
No	9	47.37
Diarrhea		
Yes	4	21.05
No	15	78.95
Headache		
Yes	17	89.47
No	2	10.53
Nauseous or vomiting		
Yes	6	31.58
No	13	68.42

Table 4. Differences in respondents' knowledge about COVID-19 before and after the intervention.

	N	Mean	SD	SE	p-value
Pre-test	160	7.09	1.75	0.14	<0.001
Post-test	160	7.94	1.49	0.12	

Table 5. Differences respondents' knowledge about COVID-19 vaccination before and after the intervention.

	N	Mean	SD	SE	p-value
Pre-test	160	5.87	2.02	0.16	<0.001
Post-test	160	7.03	1.74	0.14	

increase in high school students' knowledge about COVID-19 was expected to improve their preventive actions by complying with health protocols.

This study also showed significant differences in respondents' knowledge about COVID-19 vaccination before and after the intervention (p-value < 0.001). The COVID-19 vaccination aims to protect the human body from the SARS-CoV 2 virus and achieve herd immunity. This study was supported by research conducted at SMK Bhakti Kencana Tasikmalaya, where students' knowledge and understanding about COVID-19 vaccination increased due to the intervention given through video, PowerPoint, and poster (pre-test score of 13.40% and post-test of 36.90%). In addition, knowledge regarding the side effects of the COVID-19 vaccine also increased (pre-test score of 11.20% and post-test of 25.70%) (Noprianty, Asnawi, Jundiah, & Widyastuti, 2021). Education related to COVID-19 vaccination could increase teenagers' trust regarding the safety of the vaccines. A study conducted in Bangladesh showed that 298 respondents refused to be vaccinated, while 36.58% of them did not trust the vaccine (Mahmud, Mohsin, Khan, Mian, & Zaman, 2021). Therefore, a comprehensive intervention was

promptly needed to inform the benefits of the COVID-19 vaccine.

The limitations of physical contact during the COVID-19 pandemic have made online media an alternative for delivering education to high school students. The educational media used in this study were power points, videos, and pocketbooks. Research conducted at MAN 1 East Lombok showed that interactive PowerPoint media effectively increased knowledge and the average value of learning outcomes to 80.81 (Rahmawati, Badarudin, & Hadi, 2020). Creative and innovative videos also made information related to COVID-19 and its vaccination easy to convey due to their attractive audiovisual characteristics. Video media invite the audience to absorb much information because the two most extensive senses, namely sight and hearing, are used to absorb information (Rahmah, Setiono, & Telussa, 2021). The pocketbook was also one of the most critical and informative educational media. This was supported by a study that showed that there was a significant effect of pocketbooks on health officers' level of knowledge ($p = 0.001$) with an increase in the average value of knowledge (11.36) (Caesar & Dewi, 2018). The use of educational media needs to be developed to increase public knowledge about COVID-19 and its vaccination.

The result in our study is still need more data from another participant from other school and level of education such as student of elementary school and junior high school to increase the awareness from more students. We expect all socialization and education about COVID-19 and Vaccine in the COVID-19 pandemic can give more information and increase the awareness of students. Therefore, we can together prevent the spreading of COVID-19, particularly the emergence of new variant which is usually more transmissible compared than before.

5. CONCLUSION

Significant differences were found in students' knowledge about COVID-19 and its vaccination before and after the intervention. Community service activities using webinars, video, and pocketbooks could increase high-school students' knowledge of COVID-19 prevention. The media mentioned such as pocketbooks, video and socialization via webinar were effective for educating high-school students about health.

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