

## Preventive Behaviors Related to Covid-19 Among High School Students: Cross-Sectional Web-Based Survey

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### ABSTRACT

*The increase in COVID-19 cases encourages the need for health efforts from various sectors. The number of COVID-19 confirmed cases in Palangka Raya City is the highest in Central Kalimantan province. The Ministry of Education urged the implementation of 3M education, such as wearing masks, washing hands, and social distancing, to stop the transmission of COVID-19. This study aims to describe the level of knowledge, attitudes, and preventive behaviors related to COVID-19 and the association between knowledge and attitudes with preventive behaviors related to COVID-19 in students of MAN Kota Palangka Raya. This research is a cross-sectional study that involved 339 students as respondents. Data was collected using google form in October 2020. 98.8% of students had good knowledge of COVID-19, and 87.0% of students had positive attitudes about preventing COVID-19, but only 54.6% of students had good preventing behaviors related to COVID-19. Association was found between attitudes toward COVID-19 with preventive behaviors related to COVID-19 in MAN Palangka Raya City students in 2020. 3M's preventive behavior education efforts still need to be improved to stop the transmission of COVID-19.*

**Keywords:** attitudes; COVID-19; knowledge; preventive behavior

### ABSTRAK

Peningkatan kasus COVID-19 mendorong perlunya upaya kesehatan dari berbagai sektor. Angka kasus terkonfirmasi COVID-19 di Kota Palangka Raya menduduki posisi tertinggi seprovinsi Kalimantan Tengah. Kementerian Pendidikan menghimbau pelaksanaan edukasi 3M, yaitu memakai masker, mencuci tangan, dan menjaga jarak, dalam rangka memutus penularan COVID-19. Penelitian ini bertujuan menggambarkan tingkat pengetahuan, sikap dan perilaku mengenai pencegahan COVID-19 serta hubungan antara pengetahuan dan sikap dengan perilaku pencegahan COVID-19 pada Siswa MAN Kota Palangka Raya Tahun 2020. Penelitian ini menggunakan desain studi cross sectional dengan jumlah responden sebesar 339 siswa. Data dikumpulkan melalui *google form* pada bulan Oktober 2020. Sebesar 98,8% siswa memiliki pengetahuan COVID-19 yang baik dan 87,0% siswa memiliki sikap positif mengenai pencegahan COVID-19, namun hanya 54,6% siswa yang memiliki perilaku pencegahan COVID-19 yang baik. Terdapat hubungan antara sikap dengan perilaku

pengecahan COVID 19 pada siswa MAN Kota Palangka Raya tahun 2020. Upaya edukasi perilaku pencegahan 3M masih perlu ditingkatkan dalam upaya memutus penularan COVID-19.

**Kata Kunci:** pengetahuan; COVID-19; sikap; perilaku pencegahan

## INTRODUCTION

Coronavirus (CoV) is part of the virus family that causes illnesses from flu to severe illnesses such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). The disease caused by the coronavirus or known as COVID-19, is a new type discovered in 2019 and has not been known to attack humans before (Mona, 2020; World Health Organization, 2020; Sari et al., 2020). COVID-19 attacks humans regardless of age or gender. Common symptoms of COVID-19 infection include acute respiratory problems such as fever, cough, and shortness of breath. This virus's incubation period has an average of 5-6 days, with the longest 14 days. The disease can cause pneumonia, acute respiratory syndrome, kidney failure, and death (Kemenkes RI, 2020a). COVID-19 is spread from one person to another through close contact and droplets.

COVID-19 cases have infected 215 countries, including Indonesia. The COVID-19 cases worldwide on September

21, 2020, had reached 30,675,675 confirmed cases and 954,417 cases that led to death. COVID-19 cases in Indonesia have spread across 494 districts or cities, with a total of 248,852 confirmed cases and 9,677 cases that have resulted in death as of August 21, 2020 (Kemenkes RI, 2020). A risk-zone map presented by the COVID-19 Task Force (Satuan Tugas Penanganan COVID-19, 2020) official website shows that Palangka Raya City is in a high-risk zone in Central Kalimantan Province, while the surrounding areas of the city are currently in a moderate risk-zone. Moreover, Palangka Raya City has the highest number of COVID-19 confirmed cases in the province of Central Kalimantan (Pemerintah Provinsi Kalimantan Tengah, 2020).

Based on the Guidelines for the Prevention and Control of Corona Virus Disease (COVID-19), the preventive behavior against the COVID-19 among individuals includes washing hands using soap and running water or alcohol-based antiseptic liquid, wearing a mask, and keeping a minimum distance of 1 meter.

Other behaviors to prevent COVID-19 are limiting interaction with other people, immediately cleaning themselves after traveling, increasing clean and healthy behavior (PHBS), managing comorbidities, managing mental and psychosocial health, applying cough and sneeze ethics, and adapting to new habits (Kemenkes RI, 2020a). The Indonesian Ministry of Education and Culture has also issued a letter of appeal for the implementation of 3M education, namely wearing masks, washing hands, and maintaining distance, in teaching and learning activities (Kemendikbud RI, 2020). The behavior of 3M is now heavily campaigned to prevent the transmission of COVID-19 in the community.

The theory of "*Precede-Proceed*" developed by Lawrence Green in 1991 explains that a person's health behavior is influenced by predisposing factors, enabling factors, and reinforcing factors (Irwan, 2017). Predisposing factors that influence health behavior include knowledge, attitudes, beliefs, and other demographic factors. The enabling or supporting factors include the availability of facilities, resources, affordability. Meanwhile, reinforcing factors include support from family, friends, health workers, and others. Research conducted

by Prihanti et al. (2018) shows a significant relationship between knowledge and behavior. A person with a good level of knowledge has a better chance to behave in a clean and healthy life than someone with a lower knowledge level. Also, Purnamasari and Raharyani's (2020) study on the Wonosobo community also shows a significant relationship between knowledge and community behavior related to COVID-19. The study results conducted by Rasyid R.R et al. (2019) in adolescents have reported a significant relationship between attitudes and prevention behavior for HIV / AIDS infection. Regarding the PSBB policy during the pandemic, the Wiranti et al. (2020) study shows a significant relationship between attitude and compliance with the PSBB policy. Lestari (2019) also found a strong relationship between attitude and handwashing behavior in her study.

This study focuses on predisposing factors related to health behavior, namely the knowledge and attitudes of high school students. Senior high school students are generally in the age range of 15 to 19 years, constituting the youth age group. Although not the most vulnerable to COVID-19, the teenage age group can potentially have an infection with very

minimal symptoms. This potential causes the adolescent age group to be a source of transmission of COVID-19 without them knowing it. As a result, the spread of the *corona* virus will increase and spread rapidly. This study aims to determine the level of knowledge, attitudes, and preventive behaviors against COVID-19 in high school students. This study will also analyze the relationship between knowledge and attitudes with COVID-19 prevention behavior in high school students.

## METHOD

This study was an analytic observational study with a cross-sectional design. This study's population was all students of Madrasah Aliyah Negeri Palangka Raya City, which had 976 students. This study's sample was selected through the stratified random sampling method with a sample size of 339 students. The data in this study were collected in October 2020 by an online questionnaire (google form). The questionnaire was made by researchers that have been tested for validity and reliability. This research was conducted based on research ethics and was approved by the Faculty of Health Sciences State Islamic University Syarif Hidayatullah Jakarta number

Un.01/F.10/KP.01.1/KE.SP/011.08.001/2020. Informed consent was available on the first page of the online form and filled out by each respondent before answering the questionnaire.

Ten questions measured the students' knowledge, attitudes, and preventing behaviors related to COVID-19. The correct answer score of knowledge questions was given a score of 1, and the wrong answer was given a score of 0. The knowledge score was categorized as good if the total score attains more than 75% and was categorized as inferior if the total score merely attains 75% or less (Lestari, 2019). Simultaneously, the attitudes and preventing behaviors related to COVID-19 were measured using a modified Likert scale. The attitudes score was categorized as positive if the total score attains more than 75% and was categorized as negative if the total score merely attains 75% or less (Lestari, 2019). The preventing behaviors related to the COVID-19 score were categorized as good if the total score attains more than 75% and was categorized as inferior if the total score merely attains 75% or less (Lestari, 2019). Univariate analysis was performed using frequency distribution which is presented in tabular form. Then bivariate analysis was

performed using the chi-square test and presented in tables and figures.

## RESULTS AND DISCUSSION

A total of 339 high school students have participated in the study. Respondents'

characteristics, knowledge regarding COVID-19, attitudes towards COVID-19, and preventive behaviors against COVID-19 are presented in Table 1.

Table 1. Respondents' characteristics, knowledge, attitudes, and COVID-19 preventive behaviors

Variable	n	%
Age (years)	339	15.9 ± 0.9*
Gender		
Female	213	62.8
Male	126	37.2
Grade		
X	119	35.1
XI	111	32.7
XII	109	32.2
Knowledge related to COVID-19		
Good (>75%)	335	98.8
Poor (≤75%)	4	1.2
Attitudes toward COVID-19		
Positive (>75%)	295	87.0
Negative (≤75%)	44	13.0
Preventive Behaviors related to COVID-19		
Good (>75%)	185	54.6
Poor (≤75%)	154	45.4

\*Values are mean ±SD

Table 1 shows that respondents' mean of age was 15.9 years, and most were female. The results showed that among 339 students, 98.8% of them had good knowledge about the transmission and prevention of COVID-19. Also, most of the students had positive attitudes towards COVID-19 (87.0%). Simultaneously, only 54.6% of students

had good preventive behaviors related to COVID-19. The distribution of respondents' answers regarding questions on preventive behaviors related to COVID-19, knowledge related to COVID-19, and attitudes toward COVID-19 are presented in Table 2, Table 3, and Table 4, respectively.

Table 2. Respondents' Preventive Behaviors against COVID-19

Questions	Always-often		Sometimes		Infrequently-never	
	n	%	n	%	n	%
Do you wear a face mask when you go out?	333	98.2	5	1.5	1	0.3
Do you carry a spare face mask with you when you go out?	109	32.2	114	33.0	118	34.8
Do you change your face mask every 4 hours?	71	20.9	121	35.7	147	43.3
Do you take off your mask or put it on your chin when you speak?	79	16.8	116	34.2	144	42.5
Do you wash the mask immediately after using it?	206	60.8	81	23.9	52	15.4
Do you keep a distance from other people in public places (with a minimum distance of one meter)?	238	70.2	82	24.2	19	5.6
Do you avoid shaking hands or touching your friends?	155	45.7	126	37.2	58	17.1
Do you keep your distance when waiting in line at the shopping mall?	304	89.6	26	7.7	9	2.7
Do you always wash your hands with soap and running water after doing activities?	314	92.6	24	7.1	1	0.3
Do you always carry a Hand Sanitizer with you and use it when water and handwashing soap is not available?	207	61.0	78	23.0	54	15.9

This study showed that only 54.5% of students had good preventive behaviors related to COVID-19, and the rest, precisely 45.5% of students, had poor COVID-19 prevention behavior. However, Setyawati's study showed that most teenagers in Sidoarjo had implemented good preventive behaviors related to COVID-19 (93.8%) (Setyawati et al., 2020). Other studies conducted on the general public also showed that most people had implemented good preventive behaviors related to COVID-19 (Moudy and Syakurah, 2020; Purnamasari and Raharyani, 2020). This contradictory result may occur due to differences in the variety of questions used to determine

the implementation of preventive behaviors related to COVID-19. Furthermore, the low level of preventive behaviors related to COVID-19 among students in this study could be due to boredom due to a long-running pandemic, which is about seven months. When this study was conducted, students become ignorant towards COVID-19 preventive behaviors.

Most of the students of MAN Palangka Raya City have implemented the use of face masks when they go out (98.2%), but only 32.2% of students who always or often carry a spare face mask when they go out and 20.9% of students who

change their masks every 4 hours consecutively. Also, it was found that only 42.5% of students stated that they rarely or never opened or put their face masks on their chins when speaking, and 60.8% of students always or often washed their face masks immediately after they used them. The study conducted by Sari et al. also showed only 74.19% of the Ngronggah community obeyed the behavior of using face masks during the COVID-19 pandemic (Sari et al., 2020).

The wearing of a face mask is a practical, easy, and cheap Non-Pharmaceutical Intervention (NPI) to prevent transmission of COVID-19. Based on the study of Eikenberry et al. (2020), the wearing of face masks is beneficial to limit the transmission of COVID-19 and decrease the burden of the epidemic, especially when combined with other NPI. Correspondingly, Li et al. (2020) also mentioned in their study that the use of face masks accompanied by social distancing was effective in flattening the epidemic curve. Therefore, the wearing of face masks in the proper way must be considered to maximize the benefits of the face masks themselves. Based on the Guidelines for the Prevention and Control of Corona Virus Disease (COVID-19), face masks must

cover the nose and mouth and must be changed every 4 hours and washed immediately after use (Kemenkes RI, 2020a).

Students who stated that they always keep a minimum distance of one meter from other people in public places and keep a distance when queuing at a shopping place were 70.2% and 89.6%, respectively. Overall these findings are in line with findings reported by N. P. E. D. Yanti et al. (2020), which showed that 71.3% of Balinese people always maintain a minimum distance of 1 meter from other people, and by B. Yanti et al. (2020) which showed that 93% of the community has good behavior towards social distancing. As is well known, one of the COVID-19 transmissions is by droplets. Transmission by droplets can occur at a short distance, one meter (Kemenkes RI, 2020a). Hence, when dealing with respiratory symptoms such as coughing and sneezing at this distance, the risk of droplets hitting the mucosa (mouth and nose) or the conjunctiva (eyes) is higher.

The behavior of social distancing for most MAN Palangka Raya City students has shown promising results. However, only 45.7% of students stated that they

always avoid shaking hands or touching their friends. This result demonstrated that adolescents have tolerance towards their friends. In line with that, according to Andrews et al. (2020), adolescence was often associated with increased risk-taking, the need for social relations and peer acceptance, and sensitivity to peer influence. The instability of the social environment in this adolescent age group has resulted in high adolescent loneliness levels during the COVID-19 pandemic (Barreto et al., 2020; Sagita and Hermawan, 2020). Therefore, implementing a social distancing behavior with friends in youth groups will be quite challenging in this era of the COVID-19 pandemic.

The handwashing behaviors with soap and running water after doing activities have been implemented by almost all students in MAN Palangka Raya City (92.6%). This result is similar to the study by N. P. E. D. Yanti et al. (2020) that showed 84% of Balinese people always wash their hands with soap or *hand sanitizer* after handling

objects in public places. However, in this study, only 61.0% of students stated that they always carry *hand sanitizers* and use them when water and handwashing soap are not available. Based on the study conducted by Situmeang and Sembiring (2019), *hand sanitizer* is applicable as alternative handwashing. Nevertheless, only *hand sanitizer* with an alcohol content of 60-95% or more effectively kills germs. This idea follows the CDC's recommendation to use an alcohol-based *hand sanitizer* with a level of 60% when water and soap are not available (CDC, 2020). The high level of handwashing among students in this study was in line with the study of Głabska et al. (2020) that explained the increase in handwashing behavior among adolescents in Poland during the COVID-19 pandemic compared to before the pandemic. Education regarding proper handwashing behavior needs to be carried out, not only to stop the transmission of COVID-19 but also to prevent the spread of other viruses and bacteria that can be transmitted from person to person.

Table 3. Respondents' Knowledge Related to COVID-19

Statements	n	%
COVID-19 is a disease caused by a virus	339	100,0
Droplets do not transmit COVID-19	252	74,3
The average incubation period for COVID-19 is 14 days	334	98,5
Contact with contaminated items is the main transmission medium for COVID-19	314	92,6
A person who has been confirmed to have COVID-19 needs to be isolated	339	100,0
Good etiquette of cough/sneeze is to cover your mouth with your upper arm or a tissue	335	98,8
Increasing immunity with consumption of fruits and vegetables and exercise is not necessary	320	94,4
The use of <i>hand sanitizers</i> with 70% <i>alcohol</i> content can be done at any time to replace washing hands	316	93,2
Wash your hands with soap and clean water to prevent transmission of COVID-19	331	97,6
To avoid spreading COVID-19, keep a safe distance of at least 1 meter from other people	329	97,1

The results regarding the high level of knowledge related to COVID-19 in MAN Palangka Raya City students in this study are in line with the study of Setyawati et al., which showed that 91.5% of teenagers in Sidoarjo have good knowledge related to COVID-19 (Setyawati et al., 2020). However, these results were in contrast to the study conducted on other high school students. Natalia et al. (2020) at SMA PGRI Lembang shows a moderate level of knowledge related to COVID-19 (69,7%). Suwandi and Malinti's (2020) study at Balikpapan Adventist High School showed that only 76.7% of students have good knowledge related to COVID-19. The dissimilarity of this result may be due to

the difference in time in data collecting. Data collecting of Natalia et al. (2020) study was conducted in May 2020, and Suwandi and Malinti (2020) study done before September 2020, while the data collection in this study was conducted in October 2020 a pandemic COVID-19 have lasted less than eight months. Therefore, it is likely that students have been exposed to much information about COVID-19 from various sources. The students' knowledge related to agent, incubation period, transmission, and prevention of COVID-19 was at a high level. This could be seen clearly from the proportion of students who can answer each question correctly, which attain 92,6-100% (Table 2).

However, only 74,3% of students whose knew that COVID-19 was transmitted by droplet. This probably happened because the students did not understand the term “droplet”. Droplet is a term for particles with a diameter of 5 µm that can be inhaled and remain in the upper respiratory tract and mucosa, produced through

coughing, sneezing, and speaking (WHO, 2009). This study's result was contradictory to a previous study that showed that 96% of Indonesians already know that COVID-19 can be transmitted through coughing and sneezing (Moudy and Syakurah, 2020).

Table 4. Respondents' Attitudes Toward COVID-19

Statements	Agree		Disagree	
	n	%	n	%
Understanding of the transmission of COVID-19 is needed to prevent the disease COVID-19	334	98.6	5	1.5
In my opinion, it is not essential to know COVID-19 disease information	11	3.9	326	96.2
I realize that behavior can influence the transmission of COVID-19	247	72.9	92	27.1
In my opinion, social distancing can stop the transmission of COVID-19	313	92.3	26	7.7
Washing hands with soap can prevent transmission of COVID-19	332	97.9	7	2.1
Wearing a face mask is only for people who are sick	36	10.6	303	89.4
When not feeling well, it is better to stay at home	321	94.7	18	5.3
In my opinion, there is no need to social distancing from close friends	41	12.1	298	87.9
It is crucial to bring hand sanitizer when going out	326	96.1	13	3.9
Temperature check before entering a public place is just wasting time	30	8.8	309	91.1

The majority of students showed positive answers to each statement regarding attitudes towards the prevention of COVID-19, which ranged from 92,3 – 98,6%. However, the results showed that awareness about behavior that could influence the transmission of COVID is lower among other attitudes (72,9%). This awareness certainly affects students in implementing COVID-19 prevention behavior. Research related to attitudes about COVID-19 among high school

students in Indonesia has not been found. However, other studies conducted on communities in Indonesia generally show the same results as this study. The study conducted in Sulawesi showed 97,8% of people have a positive attitude (Sembiring and Meo, 2020). The study conducted in East Java showed 85,5% of people have a positive attitude toward COVID-19 prevention (Suprayitno et al., 2020).

Table 5. Associations of Knowledge and Attitudes with COVID-19 Preventive Behaviors

Independent Variable	Preventive Behaviors				P-value	OR	95% CI
	Good		Poor				
	n	%	n	%			
Knowledge related to COVID-19							
Good	183	54.6	152	45.4	0.854	1.204	0.168 – 8.648
Poor	2	50.0	2	50.0			
Attitudes towards COVID-19 prevention							
Good	171	58.0	124	42.0	0.002	2.955	1.504 – 5.805
Poor	14	31.8	30	68.2			

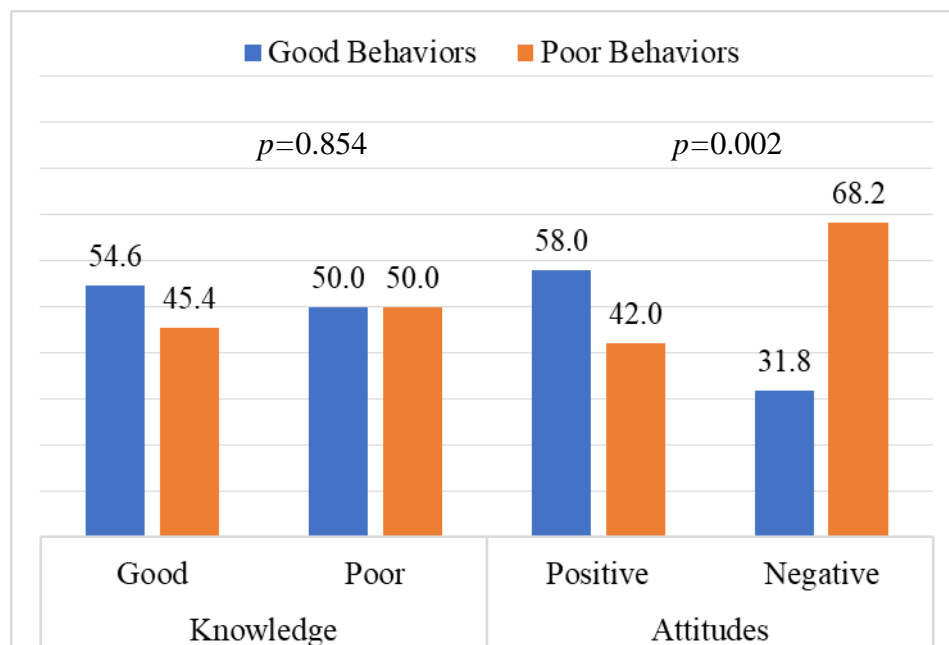


Figure 1. COVID-19 Preventive Behaviors with Students' Knowledge and Attitudes

Figure 1 shows  $p$ -value for the relationship between knowledge about COVID-19 and COVID-19 prevention behavior is more than 0.05. It means there is no significant association between knowledge about COVID-19 and preventing behaviors related to COVID-19. However, the resulting  $p$ -value for the association between attitudes towards COVID-19 and

preventing behaviors related to COVID-19 is less than 0.05, which indicates a significant association between attitudes towards COVID-19 and COVID-19 prevention behavior. An OR value of 2.955 (95% CI 1.504 - 5.805) was also obtained, which means students who have positive attitudes towards COVID-19 are 2.9 times more likely to have better-

preventing behaviors related to COVID-19 than students who have negative attitudes towards COVID-19.

The insignificant association between knowledge about COVID-19 and preventing behavior related to COVID-19 in students of MAN Kota Palangka Raya in this study is different from the results of previous studies, which show that there is a significant relationship between knowledge about COVID-19 and preventing behavior related to COVID-19 (Moudy and Syakurah, 2020; Setyawati et al., 2020). The progress of the COVID-19 pandemic is the more often exposed to information media regarding COVID-19, so that knowledge about COVID-19 was improved. According to Irwan (2017), the dimensions of cognitive processes in the new taxonomy are memorizing, understanding, applying, analyzing, evaluating, and creating. MAN Palangka Raya City students' high knowledge regarding COVID-19 is only limited to the level of memorization and understanding. It can be seen from the results of this study, showing that almost all students have good knowledge of COVID-19, but some still have poor COVID-19 prevention behavior.

The significant association between attitudes towards COVID-19 and preventing behaviors related to COVID-19 in this study is in line with Moudy and Syakurah's (2020) study results. An attitude is a form of feeling reaction or a person's evaluation of an object, which results in a feeling of support or feelings of not supporting that object. Attitude is the readiness to react to an object in specific ways. Readiness is defined as a potential tendency to react in a certain way when an individual is faced with a stimulus that wants a response so that a positive attitude will tend to encourage someone to behave positively (Putri and Setianingsih, 2016).

## **CONCLUSION**

MAN Palangka Raya City students already have good knowledge about COVID-19 and a positive attitude towards COVID-19 prevention. However, some students still have poor preventing behaviors related to COVID-19. Students' knowledge regarding droplets to transmit COVID-19 and awareness that behavior can affect the transmission of COVID-19 show unfavorable results. Changing masks every 4 hours when outside the home and social distancing behavior from friends of the students need to be improved. Besides, attitudes towards COVID-19 were found

to be associated with the COVID-19 prevention behavior of students. Accordingly, even though students' knowledge and attitudes show promising results, educational efforts and other strategic approaches are still needed, especially in improving student attitudes towards COVID-19 to advance optimal COVID-19 prevention behavior.

This study has several limitations, such as using a cross-sectional study design that does not explain the observed variables' temporal relationship. Moreover, this study is only set to predisposing factors, so it cannot explain other factors related to COVID-19 prevention behavior in adolescents. Regarding this study's limitation, research related to other factors that influence COVID-19 prevention behavior in adolescents needs to be developed with better methods to produce other information. That has not been conveyed in this study, hoping that it will help plan a more advanced approach effective in enhancing 3M's COVID-19 prevention behavior.

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