

## Differences of Self-Medication-Related Behavior among Medical Students before and during the COVID-19 Pandemic

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**Abstract:** - The COVID-19 pandemic has turned into a global public health emergency, followed by several changes in the situation. Change is occurring in healthcare where doctors are reducing hours of practice and people are anxious about coming into contact with infected patients or contaminated objects in healthcare. Medical students are one of the most frequently used self-medication practitioners. This study examines whether there are differences in behavior related to self-medication before and during the COVID-19 pandemic. This research is a comparative descriptive study with a cross sectional research design. This study took a population of students from the Faculty of Medicine, University of Lampung. Samples were taken using a non-probability sampling technique, in the form of consecutive sampling. This study compared self-medication behaviors before and during the COVID-19 pandemic. There were six self-medication-related behaviors that were compared in this study using frequency comparison tables and charts. There is a difference in the average self-medication behavior, from 3.00 before the COVID-19 pandemic, to 3.48 during the COVID-19 pandemic. There are several behaviors related to self-medication that were carried out for the first time during the COVID-19 pandemic, which were not previously carried out. There are various reasons for refraining from visiting the doctor when exposed to health problems before and during the pandemic, namely the emergence of reasons for fear of visiting clinics or homes because they could come in contact with infected patients or contaminated objects during the COVID-19 pandemic. There are differences in behavior related to self-medication before and during the COVID-19 pandemic by students of the Faculty of Medicine, University of Lampung.

**Key-Words:** - COVID 19, SARS CoV 2, Self-medication

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### 1 Introduction

Health is an important thing for individuals to be able to carry out their daily activities properly. Self-medication is a part of self-care that aims to maintain health, prevent sickness, and recover from disease. The use of drugs is the main differentiator between self-medication and self-care [1].

Self-medication is defined as the use of medicines without consulting a doctor to treat one's health problems on one's own initiative or on the advice of others [2]. Medicines used in self-medicated behavior include traditional medicines and OTC (over-the-counter) drugs [3]. Family, close friends, neighbors, pharmacists, previous prescription drugs, and advertisements in newspapers and other media are sources of self-medication information [4]. Self-medication is very common among medical students [1].

The world is currently experiencing COVID-19 pandemic. COVID-19 is caused by infection with the novel coronavirus (SARS CoV 2), which was first identified in Wuhan, Hubei, China, on December 12, 2019. Patients who were originally

identified as having been exposed to the novel CoV (formerly known as 2019-nCoV) were linked to seafood consumption in Wuhan [5, 6, 7]. SARS CoV 2 belongs to the *Coronaviridae* family. Shortness of breath, coughing, and chest pain are signs of SARS CoV 2 infection, which progresses to respiratory problems known as Acute Respiratory Distress Syndrome (ARDS) [8].

The COVID-19 pandemic has become a global public health emergency. This disease is life-threatening because of its rapid spread. This situation was complicated by the health care system and limited resources [2]. The COVID-19 pandemic was also followed by various information, both accurate and inaccurate, that was widely shared on social media about drugs that were believed to prevent and treat COVID-19, despite a lack of strong medical evidence and safety [9]. Doctors who decreased their hours of practice during the COVID-19 pandemic, as well as people who were frightened to visit clinics or hospitals because they may come into contact with patients, were among several situations that occurred during the COVID-19 pandemic [10]. Self-medicated behavior is more

likely to occur as a result of these circumstances. Buying pharmaceuticals by reusing/resending prior prescriptions, taking medicines on the suggestion of family or others, and consuming leftover medicines are all examples of self-medication behaviors [11].

In this unprecedented context (the COVID-19 pandemic), and the aforementioned potential implications for the occurrence of self-medicated behaviors, researchers feel it was important to examine the impact of the COVID-19 pandemic on the tendency to do behavior related to self-medication. This study seeks to find out whether there was differences in behavior related to self-medication before and during the COVID-19 pandemic among students of the Faculty of Medicine, University of Lampung. The study was conducted on a population of medical faculty students as one of the populations that tends to do self-medication.

## 2 Methods

This research is a comparative descriptive research with a quantitative approach using a cross sectional research design. This research was conducted using primary data taken from the answers to the questionnaire. There are six behaviors related to self-medication compared in this study, namely 1) behavior consuming supplements to improve physical and cognitive abilities; 2) behavior buying drugs just in case if needed; 3) refrain from consulting a doctor even though had disturbing health symptoms; 4) self-medicated behavior to deal with health complaints according to symptoms/complaints; 5) the behavior of consuming the remaining drugs from a doctor's prescription to treat health complaints; and 6) behavior advises family or close friends to deal with complaints of health by self-medication without a doctor's recommendation first [1, 12, 13, 16, 21]. All data are presented in the form of tables and graphs of frequency comparisons to describe the findings obtained.

### 2.1 Participants

The population in this study is all students of the Faculty of Medicine, University of Lampung with a total population of 683 students. The sampling technique used was non-probability sampling, in the form of consecutive sampling. The Slovin formula was used to determine the number of samples in this study, which resulted in a sample size of 252.

### 2.2 Data Collection and Data Analysis

Data collection using a questionnaire was conducted between January 1 and 10, 2021. Respondents were questioned about their experiences during the

COVID-19 pandemic. The COVID-19 pandemic phase of the research began on April 13, 2020, when SARS CoV 2 infection was declared a national emergency in Indonesia. The questionnaire used was a structured questionnaire that was developed on purpose, consisting of 6 statements and 2 questions containing behaviors related to self-medication. The questionnaire was created by the author and the validity of the contents of the questionnaire was confirmed through consultation with experts and trials. Respondents get one point for each statement that a behavior had been performed, with a total maximum score of 6. All participation was voluntary.

## 3 Results

### 3.1 Differences in the Number of Behaviors Related to Self-Medicine Conducted before and during the COVID-19 Pandemic

The number of self-medicated behaviors carried out by respondents before and during the COVID-19 pandemic was different. The average number of behaviors related to self-medication carried out before the COVID-19 pandemic was 3.48, while the average before the COVID-19 pandemic was 3. Detailed information about the differences in the number of respondent behaviors is presented in figure 1.

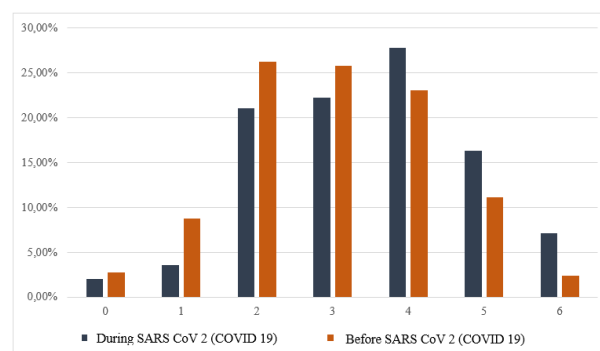


Fig. 1: Differences in the Number of Behaviors Related to Self-Medicine Conducted Before and During the COVID-19 Pandemic

Statistical analysis is needed to see if there are significant differences between the number of self-medication-related behaviors performed before and during the COVID-19 pandemic. For this reason, the Chi Square test was carried out because the data distribution was not normal. The results of the Chi Square test can be seen in Table 1. The statistical analysis results show that the number of self-medication behaviors before and after the COVID-19 pandemic shows a significant difference where the Asymp value. Signature < (0.05).

Tabel 1. The results of the Chi Square test differ in

the number of self-medication behaviors carried out before and during the COVID-19 pandemic

	Before Pandemic	During Pandemic
Chi-Square	12.400 <sup>a</sup>	15.333 <sup>a</sup>
df	3	3
Asymp. Sig.	.006	.002

### 3.2 Differences in Self-Medication-Related Behavior before and during the COVID-19 Pandemic

Self-medication-related behavior, in the form of consuming supplements, among students of the Faculty of Medicine, University of Lampung, was different before and during the COVID-19 pandemic. The behavior of self-medication supplements both before and during the pandemic was carried out by 38.1% (96) of the total sample (252 respondents). It is interesting to find that there was a change in behavior in 67 (26.6%) of respondents who initially did not take supplements before the pandemic period changed to taking supplements during the pandemic period. Self-medicated supplements were not carried out both before and during the COVID-19 pandemic by 86 (34.1%) other respondents.

Self-medication related behavior, in the form of buying medicines just in case if needed, was mostly done by respondents (students of the Faculty of Medicine, University of Lampung). This behavior was carried out by 69% (174) of respondents both before and during the COVID-19 pandemic. This behavior was first carried out by 10.7% (27) respondents during the COVID-19 pandemic and 4.8% (12) other respondents stopped doing this behavior during the COVID-19 pandemic. As many as 15.5% (39) of respondents did not buy medicine just in case it was needed both before and during the

pandemic period.

The behavior of refraining from consulting a doctor despite having disturbing health symptoms was carried out by 33.7% (85) of respondents. This behavior increased during the COVID-19 pandemic by 16.3% (41) first time respondents during the pandemic period. This behavior was stopped during the pandemic by 8.3% (21) of respondents. As many as 41.7% (105) responses did not perform this behavior.

Self-medicating behavior to deal with health complaints was a common behavior by respondents, both before and during the COVID-19 pandemic. This behavior was carried out by 81.3% (205) respondents both before and during the COVID-19 pandemic. However, it was found that several respondents first resolved their complaints by self-medication during the COVID-19 pandemic as many as 3.2% (8) of respondents.

Most of the respondents did not practice self-medicated behavior by consuming prescription drugs. This behavior was not carried out, both before and during the COVID-19 pandemic, by 65.1% (164) of respondents. As many as 6.7% (17) of respondents were found to have carried out this behavior for the first time during the COVID-19 pandemic.

The behavior of advising family or close friends to deal with complaints of health with self-medication without a doctor's recommendation itself was found that 28.6% (72) of respondents did it both before and during the COVID-19 pandemic. As many as 62.7% (158) of respondents did not recommend self-medication, either family or close friends. Detailed information on the frequency distribution of respondents is presented in Table 2.

Table 2. Distribution and Frequency of Respondents Based on Behavior Related to Self-Medicine

Self-Medicated-Related Behaviors	Yes, before and during the COVID-19 pandemic		Yes, only during the COVID-19 pandemic		Yes, only before the COVID-19 pandemic		No, never at all		Total	
	n	%	n	%	n	%	n	%	n	%
Behavior consuming supplements to improve physical and cognitive abilities	96	38,1	67	26,6	3	1,2	86	34,1	252	100
Behavior buying drugs just in case if needed	174	69	27	10,7	12	4,8	39	15,5	252	100
Behavior refrain from consulting a doctor even though had disturbing health symptoms	85	33,7	41	16,3	21	8,3	105	41,7	252	100
Self-medicated behavior to deal with health complaints according to symptoms / complaints	205	81,3	8	3,2	12	4,8	27	10,7	252	100
The behavior of consuming the remaining drugs from a doctor's prescription to treat health complaints	61	24,2	17	6,7	10	4,0	164	65,1	252	100

Behavior advises family or close friends to deal with complaints of health by self-medication without a doctor's recommendation first	72	28,6	16	6,3	6	2,4	158	62,7	252	100
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### 3.2 Differences in Reasons for Not Visiting a Doctor before and during the COVID-19 Pandemic

Respondents who chose "Yes, it's done" in the statement regarding the respondent's choice when experiencing health problems before and during the COVID-19 pandemic, were asked to provide answers/reasons for choosing to refrain from visiting doctors. The same reason was found before and during the COVID-19 pandemic. The reason was that the disease/complaint was not serious. However, a different reason was found in the

second most frequent order before and during the COVID-19 pandemic. The second most common reason for respondents who answered "yes" to the questionnaire before the pandemic was previous experience with complaints so they knew how to treat it while the second most frequent reason on the questionnaire during the pandemic period was fear of visiting clinics or hospitals because of possible contact with infected patients or contaminated objects. Detailed information on the frequency distribution of respondents is presented in Table 3.

Table 3. Difference Reasons for Not Visiting a Doctor Before and During the SARS CoV 2 (COVID 19) Pandemic

Reasons for Not Visiting a Doctor Before and During the COVID-19 Pandemic	Before Pandemic		COVID-19 During Pandemic	
	n	%	n	%
Diseases/complaints that were experienced were not serious	92	48,4	79	32
Previous experience with complaints so that you know how to treat them	51	26,8	46	18,6
Save money on going to the doctor	43	22,6	31	12,6
The location of the health service facility/doctor is far away	3	1,6	2	0,8
There is no transportation	1	0,5	1	0,4
Fear of visiting clinics or hospitals because they may come into contact with infected patients or contaminated objects*	-	-	76	30,8
Not having the right time due to doctors reducing their practice hours during the COVID-19 pandemic*	-	-	12	4,9
Total	190**	100	247**	100

\* Other reasons that appeared on questionnaires during the COVID 19 pandemic

\*\* Each respondent can choose more than one reason

### 3.3 Difference in Complaints that Were Often Treated with Self-Medication before and during the COVID-19 Pandemic

To obtain data in this category, respondents were asked to provide answers to complaints that were often treated with self-medication. The results of the data processing can be seen in Table 4. In general, there is not much difference between the complaints that are often felt by respondents, both before the pandemic or during the pandemic. Even if we carefully analyze the data in Table 4, there is almost no difference in the numbers in the two conditions. The most common complaints of both periods are fever, flu, headache and cough.

Table 4. Frequency of Respondents Based on Complaints Often Treated with Self-medication Before and During the COVID-19 Pandemic

Health Complaint	Before COVID-19 Pandemic		During COVID-19 Pandemic	
	n	%	n	%
Fever	172	22,1	162	21,5
Flu	146	18,7	147	19,5
Headache	138	17,7	137	18,2
Cough	115	14,7	107	14,2
Diarrhea	82	10,5	79	10,5
Pain	68	8,7	77	10,2
Nausea and vomiting	51	6,5	37	4,9
Dyspepsia	8	1	8	1,1
Total	780*	100	754*	100

## 4 Discussion

The period from when SARS CoV 2 infections was declared to be a national disaster on April 13, 2020 until the end of data collection (January 10, 2021), some self-medication related behavior by students of the Faculty of Medicine, University of Lampung changed. These changed behaviors included 67

(26.6%) respondents who initially did not take supplements prior to the pandemic changing to taking supplements during the pandemic to improve physical/cognitive performance for the first time, 10.7% of people who had never previously purchased them. medicines before they are needed, do it, and as many as 16.3% of respondents with worrisome symptoms who previously would have checked with a doctor, chose to refrain from visiting a doctor during the pandemic.

#### **4.1 Difference in the Number of Self-Medication-Related Behaviors Conducted before and during the COVID-19 Pandemic**

There is a difference in the average number of self-medication behaviors revealed by respondents. Before the COVID-19 pandemic, the average number of self-medication behaviors was 3.48, whereas the average before the COVID-19 pandemic was 3. Makowska *et al.*, [12] also found an increase in the number of self-medication behaviors before and during the COVID-19 pandemic in their study. In a study by Makowska *et al.* [12], the mean of behavior related to self-medication increased from 0.94 to 2.1. However, data on the significance of these changes cannot be obtained from this mean value. Therefore, in this study, statistical data processing was carried out to see this. Referring to the data presented in Table 1, the statistical test results show a significant difference. This means that the COVID-19 pandemic has had an impact on changing student attitudes in doing self-medication. So this research actually strengthens the results of research conducted by Makowska *et al.* related to changes in the number of people's cell-medication attitudes before and during the pandemic.

The increase in the average number of self-medicated behaviors prior to and during the COVID-19 pandemic is considered to be linked to the health-care system's situation. This was confirmed during an interview session with several participants, where they said that they were more likely to take self-medication as prevention and treatment because health facilities were limited with a large number of patients. They see that all health workers are overwhelmed, so they are afraid that they will not be served optimally in hospitals or other health care facilities. Of course, this seems to be a reasonable reason because changes in the health system coupled with limited resources cause anxiety, especially in seeking treatment to health services [2]. Changes in the health service system situation during the COVID-19 pandemic in the form of doctors reducing their practice hours and fear of visiting clinics or hospitals believing that they may be in contact with infected patients or

contaminated objects [10]. These things support an increase in the number of behaviors related to self-medication.

#### **4.2 Behavior Consuming Supplements to Improve Physical and/or Cognitive Ability**

Supplements are products that are consumed to complement daily nutritional needs. The content in the supplement is one or more of the following ingredients: vitamins, minerals, plants or ingredients derived from plants, amino acids, materials used to increase the nutritional adequacy rate [13].

According to research results, both before and during the pandemic had been carried out by 38.1% (96) respondents. Changes in behavior in 67 (26.6%) respondents who initially did not take supplements prior to the pandemic changed to taking supplements during the pandemic. Self-medicated supplements were not carried out both before and during the COVID-19 pandemic by 86 (34.1%) other respondents. The value of the change in the percentage of consumption of this supplement has a very significant increase during the pandemic. In the interview session, information was obtained that they felt anxious about their health condition during a pandemic, so they tended to immediately protect themselves by taking supplements.

The results of this study have strengthened the results of several other studies related to the behavior of taking supplements in self-medication. Even in this study, the increase in respondents taking supplements during the pandemic reached more than 20%. This value is almost the same as the research data conducted by Sadio *et al.* Research conducted on Polish society (1013 respondents) during the COVID-19 pandemic lockdown, for example, 10.8% of respondents chose to take drugs to improve physical/cognitive performance for the first time during the pandemic. Based on this, the change in the behavior of supplement self-medication for the first time was greater in students of the Faculty of Medicine, University of Lampung. Concerning the use of supplements during the COVID-19 pandemic. Sadio *et al.*, [9], found that in the high-risk group exposed to COVID-19 infection in the Republic of Togo, nearly a third of respondents (27.6%) chose to take vitamin C during the pandemic, due mainly to several studies supports the benefits of high doses of vitamin C.

Supplements that also function to improve cognitive and/or physical abilities, so that, health remains good, is one of the preventive measures for the transmission of COVID-19 carried out by health students. especially in vitamin C which is widely consumed during the pandemic. This is because

based on data from interviews with several respondents, the type of supplement that is mostly consumed by them is vitamin C. This is because of the function of vitamin C as an antioxidant and can increase endurance. This was stated in the research presented by Khasawneh *et al.*, [14], maintaining and paying attention to physical health was something that was often done by 53.4% of respondents during the COVID-19 pandemic.

Supplements are widely used to improve/maintain overall health and fitness, prevent disease, and correct nutritional deficiencies in food. During the COVID-19 pandemic, there was an increase in the advertising of dietary supplements in the media, which are considered to be helpful in the treatment and prevention of COVID-19. This resulted in the increase in supplement purchases reaching three times the usual amount. During the COVID-19 pandemic, most individuals used supplements to boost their immunity, improve their general health and wellbeing, and cover nutritional gaps in their diet. People who began supplementing during a pandemic did so to increase their immunity and/or protect themselves from COVID-19 [15].

During COVID-19, public interest in the usage of self-medicated supplements has increased, as seen by an increase in dietary supplement purchases. Self-medicated supplements may have increased due to behaviors, beliefs, and other psychological constructs associated with medication and dietary supplements, as well as various health problems, during the COVID-19 pandemic [16].

#### **4.3 Behavior Buying Drugs Just in Case if Needed**

The behavior of buying drugs just in case if needed was carried out for the first time by 10.7% of respondents with the other 69% doing it before and during the COVID-19 pandemic. Actually, this is similar to the reason for the increase in the number of supplement consumption. Several informants said that the purchase of medicines was one of the preventive measures during the pandemic due to activity restrictions. In addition, several cases of students who were confirmed to be infected with COVID-19 also stated that the preparation of these drugs was very helpful in their healing process, especially for those who experienced symptoms. Generally, medicines purchased as preparations are paracetamol and cold medicine. But some of them get a prescription from a doctor.

The results of this study turned out to produce the same tendency as other studies. Generally, there is an increase in the purchase of medicines by the public as an effort to anticipate transmission. Research conducted on the Polish public (1013 respondents) during the COVID 19 pandemic lockdown, provides similar results. This behavior

was carried out by 15.5% of respondents who had never bought prescription drugs before they were needed, did so during the COVID-19 pandemic. Changes in behavior related to self-medication in the behavior of buying drugs if needed do not always indicate that they will always do self-medication, but will increase the likelihood of self-medication [12].

Changes in the functioning of health services, as well as the worry of not being able to contact doctors, may have contributed to these people's desire to protect themselves through this preventive purchase of medications [12]. Precautionary medication purchases are typically made to treat minor diseases without having to see a doctor. Over-the-Counter (OTC) medicines are often utilized. OTC medicines are often used since they do not require a prescription and do not have a specific administrative procedure in their acquisition [17].

#### **4.4 Behavior Refrain From Consulting a Doctor Even though Had Disturbing Health Symptoms**

In this category, the results are quite surprising, where as many as 41.7% of respondents chose not to consult a doctor during the pandemic. Even though they feel symptoms on their bodies. However, it turns out that this result has strengthened the tendency of people's attitudes to consult with doctors studied by other researchers. Research conducted on Polish society (1013 respondents) during the pandemic lockdown COVID-19, showed a similar result. This behavior is carried out by 12.1% of respondents with worrying symptoms who previously would have checked with a doctor, choosing not to do it [12].

Behavioral changes related to self-medication were also found in the behavior of seeking medical help for health complaints and buying medicines if needed. Choosing not to visit a doctor despite experiencing worrisome symptoms and/or purchasing prescription medications before they are needed does not always indicate self-medication, but delaying to see a doctor while sick and having access to medication both raise the chance of self-medication [12].

Respondents had different reasons when they refrained from seeking doctor's help for health complaints before and during the COVID-19 pandemic. The most common reason stated by respondents before the COVID-19 pandemic was that the illness or complaints they experienced were not serious followed by experiences with these complaints so they knew how to treat them. A study of medical students at the University of Gondar in Ethiopia also found that previous experience and the non-seriousness of the disease were the top two

variables cited as reasons for self-medication [18]. According to Nasir *et al.* [19], this reason arises because self-medication can provide an alternative for those who are "underprivileged" to avoid high costs in clinical services and are also supported by many drugs that are sold freely (OTC) without a doctor's prescription.

The most common reason for holding back from seeking doctor's help for health complaints during COVID-19 pandemic was that the illness or complaint is not serious (see Table 3), followed by the fear of visiting a clinic or home because it may be in contact with an infected patient or object contaminated with the SARS CoV virus 2. The emergence of this reason occurs because of fear of corona virus [12]. People were also hesitant to call an ambulance, according to media accounts, and often phoned late because they were terrified of being infected by the virus by paramedics or at the hospital. The same opinion was also shared by Patil *et al.*, [10], with the risk of being infected with the virus, people were frightened of coming into contact with infected patients or contaminated objects if they went to clinics or hospitals. The COVID-19 pandemic has also led to border activities in number of locations, as well as a reduction in the number of work hours several doctors.

#### **4.5 Self-medicated Behavior to Address Health Complaints/Symptoms**

Data were obtained regarding the response to self-medication behavior to overcome health complaints/symptoms. As many as 81.3% (205) of respondents did self-medication to deal with their health complaints both before and during the COVID-19 pandemic. Meanwhile, this behavior was only done for the first time during the COVID-19 pandemic as many as 3.2% (8) of respondents. This is because students are one of the most perpetrators of self-medication, including medical students [1]. This is evidenced from several previous studies. According to research conducted by Helal and Abou-ElWafa [11], out of 900 university students in Monsuara, Egypt, 62.9% had self-medicated. Research conducted by Tesfaye *et al.* [20] discovered that 64.5% of students practiced self-medication out of a total 425 students who participated in the study. This is also supported by research conducted by Subashini and Udayanga [3], of 700 students, 78% of them did self-medication.

Self-medicated behavior is used to overcome several health problems. There is no difference in the types of complaints that are often mentioned by self-medication by respondents. These complaints are fever, flu, headache, cough, diarrhea, pain, nausea and vomiting, and ulcers. Helal and Abou-ElWafa [11] came to the same conclusion, stating

that medications meant to cure fever, flu, headache, sore throat, intestinal colic, and cramps are commonly utilized in self-medication. The same result was conveyed in a study conducted on medical students of University of Gondar, Ethiopia, where fever and headaches were the most often self-treated illnesses followed by coughs and colds [18].

#### **4.6 Self-medicated Behavior by Consuming Remaining Drugs of a Doctor's Prescription**

The behavior of consuming leftover medicines from a doctor's prescription can lead to irrational self-medication. Only a few respondents did this behavior related to self-medication involving the consumption of leftover medicines from a doctor's prescription for the first time during the COVID-19 pandemic. This behavior was not carried out, both before and during the COVID-19 pandemic by 65.1% (164). Irrational self-medication can cause harm to health, one of which is drug side reactions. The emergence of drug side effects is due to a lack of vigilance in the use of self-medicated drugs regarding potential side effects, drug interactions [21]. Self-medicated practices must be supported by the empirical medical knowledge/information to avoid irrational drug usage which in turn can lead to waste of resources, increase pathogen resistance and poses severe health risks such as prolonged illness, adverse drug reactions and drug dependence [22].

#### **4.7 Behavior Suggesting Family or Close Friends to Overcome Complaints of Health with Medicines without a Doctor's Recommendation**

Behavior suggesting family or close friends to overcome complaints of health with medicines without a doctor's recommendation was carried out by 28.6% (72) of people both before and during the covid 19 pandemic. Total 16.3% (16) of respondents did this for the first time during the pandemic and 2.4% (6) of respondents stopped at pandemic period. As many as 62.7% (158) of respondents did not recommend self-medication to their family or close friends. The behavior of providing information for self-medication was rarely done by students of the Faculty of Medicine, University of Lampung. This relates to behavior, beliefs, and other psychological constructs associated with self-medication [16].

The behavior of suggesting family or close friends to resolve complaints was rarely done by students of the Faculty of Medicine, University of Lampung, in line with research conducted by Fuaddah [23]. This may be related to the indirect influence of the family. Family can indirectly



influence self-medicated behavior. Family influences through the habits of other family members in doing self-medication, both from the type of drug to the way of consuming it. Other indirect effects, related to the influence of the family on the type of medicine can also occur, where the family usually has provided medicines at home to be used if needed. So that one family tends to choose the same type/brand of medicine for certain health complaints. This is like a suggestion on a certain brand of medicine that has been felt by previous people in the family so that they provide recommendations and even prepare the drug for use by other family members if they experience the same disease. This is why the behavior of giving advice to family members is less common [23].

## 5 Conclusion

The conclusion obtained in this study is that there are differences in behavior related to self-medication before and during the COVID-19 pandemic. There is a difference in the average number of behaviors related to self-medication carried out before as well as in the COVID 19 pandemic by students of the Faculty of Medicine, University of Lampung. This can be seen in the results of the analysis using the chi square test where the Asymp value. Sig. <  $\alpha$  (0.05). Different behaviors include the behavior of taking supplements to improve physical and/or cognitive abilities, the behavior of buying drugs just in case if needed, and behaviors and reasons for refraining from visiting doctors despite having disturbing health symptoms.

The results of this study can have implications for several parties, such as health service institutions and government. The data in this study provide an illustration of the pattern of community attitudes in dealing with pandemic conditions. So that through the results of this study, several efforts can be made by the government and health service institutions, such as: 1) preparing a special hospital for handling COVID-19 because there is a tendency for people to be afraid of getting infected if they check themselves in a hospital that handles COVID-19 patients; 2) condition the supply of supplements and medicines to be sufficient; and 3) providing technology-based services related to the purchase of medicines or supplements, such as online sales, so that the public will remain supplied without much contact with other people.

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