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# EVALUATION OF KNOWLEDGE AND BEHAVIOR ON ANALGESIC SELF-MEDICATION IN HEALTH AND NON-HEALTH STUDENTS AT MUHAMMADIYAH UNIVERSITY, YOGYAKARTA

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**ABSTRACT**
Pain is the most common cause that encourages someone to do self-medication. A person's level of knowledge is known to influence a person's behavior in self-medication. The study evaluates the level of knowledge and behavior toward self-medication using analgesics among health and non-health students at the University of Muhammadiyah Yogyakarta. This research uses a non-experimental observational research design with a cross-sectional approach. The sample used was 752 health and non-health students at the University of Muhammadiyah Yogyakarta. The level of knowledge of health students is good, with a percentage of 75.3% good; 21.0% is sufficient; and 3.7% is less, while the level of knowledge of non-health students is adequate, with a percentage of 33.5% good; 50.5% is sufficient; and 16.0% is less. The behavior of health students is good, with 86.7% good, 12.5% adequate, and 0.8% less, while the behavior of non-health students is good, with 80.9% good, 17.5% enough, and 1.6% less. The difference in the level of knowledge and behavior of analgesic self-medication between health and non-health students is quite significant, with the results of the Mann-Whitney test analysis showing a value of 0.000 on the level of knowledge and 0.001 on behavior. The relationship between the level of knowledge and behavior of health students and the Spearman Rank correlation test showed a result of 0.039 with an R-value of 0.107. In contrast, non-health students showed a result of 0.027 with an R-value of 0.114, indicating a significant and weak relationship between both.

**Keywords:** Knowledge; Behavior; Analgesic self-medication; Health student; Non-health student

## 1. INTRODUCTION

Health is vital for everyone's life. One of the health supports is self-medicating behavior, or self-medication. Self-medication is the selection and use of drugs by individuals to treat self-identifiable diseases or symptoms (WHO, 2000). People usually self-medicate to treat minor complaints and illnesses, as it is a cost-effective alternative to seeking professional treatment. The results of the 2019 National Socio-Economic Survey showed that the percentage of the population who did self-medication due to health complaints was 71.46%, an increase of 0.72% from 2018. This condition indicates that self-medication behavior in Indonesia is quite large and will likely continue to increase (Badan Pusat Statistik, 2019).

Medication errors are still becoming a concern worldwide. The prevalence of medication errors is high. Medication errors can occur in implementing self-medication due to limited knowledge of drugs and their use. Improper use of drugs can result in irrational drugs, delay

seeking medical advice, and increase side effects and drug interactions (Aljadhey et al., 2013; Arundina & Widyaningrum, 2020).

Pain is one aspect that is the most common cause that drives a person to seek treatment. Pain (headaches, toothaches, aches, and menstrual pain) is the most significant percentage experienced by respondents in carrying out self-medication, as shown in Panyabunan City, which is 51.2% (Harahap et al., 2017). Among health science students, one of the most commonly used groups of drugs for self-medication is analgesic agents. “Analgesic” is a term that refers to any medication to relieve pain and is also known as a painkiller. Most nursing students self-medicate using paracetamol (57%), followed by ibuprofen (20%), diclofenac (5%), and meloxicam (2%). Use of these analgesics to treat headaches (45%), menstrual pain (23%), and fever (14%). The reason for doing self-medication is because there is little time to consult with doctors (68%), and they have received lectures about medicine. It is important to not underestimate the inappropriate use of over-the-counter painkillers given the diversity of patient knowledge and behavior that has been observed across the globe. Community pharmacists are in the best position to advise patients on self-medication or to refer them to a doctor when necessary (Faqihi & Sayed, 2021; Serge et al., 2019)

Pain is often a nuisance enough that everyone tries to treat it themselves. Islam encourages everyone to strive independently for something better for themselves. In order to handle medication independently, the behavior of drug selection, use, and storage is very influential on a person's success in self-medication. A person's behavior is strongly influenced by the knowledge he has obtained and the treatment performed by someone. The knowledge that a person has can affect the self-medication he takes. The better the knowledge and behavior of a person in self-medication will be, possible the rate of medication errors will also decrease, so further research is needed on a person's knowledge and behavior in self-medicating (Chautrakarn et al., 2021; Gupta & Chakraborty, 2022).

Students are the younger generation who have the opportunity to receive formal education in higher education. Students with essential health and non-health sciences have differences in their acceptance of knowledge, but the treatment is still independent. It depends on the individual. Health students will be public health advocates in the future who can accept public complaints and provide independent treatment solutions to someone in need, so health students will have a better level of knowledge. Ignorance of the warnings and precautions, storage requirements, recommended shelf life, and adverse responses increases the danger of side effects. Culture, ethnicity, and religion all have an impact on treatment attitudes. The roles of the family, school, medical personnel, and health authorities are of the utmost importance for adopting steps to handle this health problem more effectively in light of these findings (De Sanctis et al., 2020;Paut Kusturica et al., 2016).

The University of Muhammadiyah Yogyakarta is one of the universities located in the Special Region of Yogyakarta and consists of students majoring in health and non-health. Self-medication behavior has undoubtedly become natural for health students, but not for non-health majors. Because the level of knowledge will influence a person's decision-making, including self-medication, it is necessary to conduct research that can evaluate specific self-medication knowledge and behavior for health and non-health students regarding analgesic drugs often used in the community to deal with.

## 2. METHODS

### 2.1. Research Design

This research is non-experimental observational study with a cross-sectional approach. The data was obtained through the distribution of questionnaires, which were carried out using electronic media to facilitate their distribution. The samples used were health and non-health

students at the University of Muhammadiyah Yogyakarta, each of which amounted to 376 respondents from a total population of 17,977. Cluster random sampling determined the number of samples using the Lemeshow formula and the sampling technique in this study. The inclusion criteria was students registered as active students in the health and non-health study program at Muhammadiyah University of Yogyakarta, willing to fill out a questionnaire, and having self-medicated with analgesic drugs.The sample was then given instructions to complete the questionnaire. The data from the questionnaires were processed and edited by coding in Microsoft Excel. We analyzed the data using the Mann-Whitney test to determine the differences in the level of knowledge and behavior of health and non-health students. The researchers analyzed the data using the Spearman rank test to determine the relationship between the level of knowledge and self-medication behavior of health and non-health students. The researchers presented the test result data in tabulated form.

### 2.2. Ethical Approval

The study was approved by the Health Research Ethics Committee, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta Indonesia, No. 234/EC-KEPK FKIK UMY/VIII/2021.

## 3. RESULTS AND DISCUSSION

### 3.1. Characteristics of Respondents

The characteristics of the respondents in this study were divided into four categories, namely age, gender, faculty, and year of class. The characteristics of respondents can be seen in **Table 1**.

**Table 1.** Characteristics of respondents

| Characteristics | Total (N = 752) | % |
|---|---|---|
| Age (years) | | |
| 18 | 111 | 14.8 |
| 19 | 132 | 17.8 |
| 20 | 155 | 20.6 |
| 21 | 210 | 27.9 |
| 22 | 98 | 13.0 |
| 23 | 38 | 5.1 |
| 24 | 8 | 1.1 |
| Gender | | |
| Man | 244 | 32.4 |
| Woman | 508 | 67.6 |
| Faculty | | |
| Medicine and Health Sciences | 376 | 50 |
| Technique | 56 | 7.4 |
| Agriculture | 32 | 4.3 |
| Economics and Business | 92 | 12.2 |
| Social and Political Science | 82 | 10.9 |
| Law | 35 | 4.7 |
| Islam | 46 | 6.1 |
| Language Education | 33 | 4.4 |
| Force Year | | |
| 2018 | 380 | 50.5 |
| 2019 | 115 | 15.3 |
| 2020 | 134 | 17.8 |
| 2021 | 123 | |

The most significant number of respondents based on age was 21 years old (27.9%), and the gender of the majority of respondents was female, with a percentage of 67.6%. Half of the respondents are students in the Faculty of Medicine and Health Sciences, while the other 50% are

across several faculties identified as non-health. The respondents who participated the most were students in the 2018 class, with 380 respondents (50.5%). The results of this study are the same as those of Arrais et al., who found that more women self-medicate than men. This condition is because women experience more headaches, such as migraines, muscle pain, and dysmenorrhea (Arrais et al., 2016). The value of the answers determines the level of knowledge, which is divided into three categories.

### 3.2. Knowledge Level

The level of knowledge is said to be good if the value obtained from the respondents' answers is more than 80% of all questions; the level of knowledge is sufficient if the value obtained is 60–80%; and the level of knowledge is said to be lacking if the value is below 60% (Winarno, 2018). The results of measuring the level of knowledge can be seen in **Table 2**.

**Table 2.** Knowledge level

| Knowledge level | Health | | Non-Health | |
|---|---|---|---|---|
| | (n) | (%) | (n) | (%) |
| Not enough | 14 | 3.7 | 60 | 16.0 |
| Enough | 79 | 21.0 | 190 | 50.5 |
| Well | 283 | 75.3 | 126 | 33.5 |
| Total | 376 | 100 | 376 | 100 |

75.3% of health student respondents belong to the category of good knowledge, 21.0% of respondents fall into the category of sufficient knowledge, and 3.7% fall into the category of less knowledge. Meanwhile, for non-health students, 33.5% of respondents belong to the excellent knowledge category, 50.5% of respondents fall into the category of sufficient knowledge, and 16.0% of respondents fall into the category of less knowledge. The table shows that, in general, health students' knowledge level is greater than that of non-health students.

In this study, the level of knowledge has several sub-variables; the first sub-variable is knowledge about drug selection according to the symptoms of the disease. 97.1% of health students correctly answered, indicating their knowledge of adjusting headache medicine to the type of headache they experience (statement number 1). As many as 84.0% of health students answered correctly, meaning they know that paracetamol can help relieve pain. Toothache (statement number 4), and as many as 58.8% of health students answered the statement correctly Statement number 3 is a negative statement, so it has an answer of "false," which means that health students know that ampicillin (an antibiotic) cannot be used to relieve headaches (statement number 3). Non-health students, totaling 90.4%, correctly answered statement number 1, indicating their knowledge of the need to adjust headache medicine according to the type of headache they experience. As many as 61.4% of non-health students answered correctly and knew that paracetamol could treat headaches. Help relieve toothaches (statement number 4). 57.7% of non-health students answered that they were unaware that ampicillin (an antibiotic) cannot be used to relieve headaches (statement number 3).

In the next sub-variable regarding knowledge about drug classes that can be used in self-medication, most health and non-health students answered the statement correctly. Statement 6 reveals that 89.1% of health students are aware that not all headache medicines require a doctor's prescription. Statement number 5 reveals that 55.9% of health students are aware that headache medicines with an over-the-counter medicine logo on their packaging can be bought without a prescription from pharmacies. Statement number 6 reveals that 67.6% of non-health students are aware that headache medicines can be purchased without a doctor's prescription, and 41.0% of them also know that these medicines have a medicine logo on their packaging. Free must not be purchased at the pharmacy (statement number 5).

The third sub-variable is knowledge about using the right medicine in self-medication; most health and non-health students answered correctly. Health students answered correctly that

headache medicine is taken according to the rules in the medicine package (statement number 8), with 96.8% of them knowing this. In contrast, statement number 2, which is a negative statement, received a "wrong" answer. However, as many as 71.3% of health students answered correctly, which means the majority of health students do not know that not all pain medications should be taken after eating (question number 2), 48.4% of health students do not know that headache medications (such as Paramex® and Saridon®) can be taken before eating (statement number 9), and in the subvariable statement number 10 is a negative statement so that it has the answer "false". The results can be seen in the graph stating that 92.8% of the majority of health students know that it is not permissible to take drugs with double doses (statement number 10). Statement number 8 reveals that 85.1% of non-health students are aware that headache medicine should be taken according to the instructions on the medicine package, while 56.4% of non-health students are unaware that not all painkillers need to be taken after eating. (Statement number 2), as many as 44.4% of non-health students also do not know that headache drugs such as Paramex and Saridon can be taken before eating (Statement number 9). In the sub-variable, number 10 is a negative statement, so it has the answer "false". The results obtained in the graph above state that as many as 77.1% of non-health students are aware of the prohibition of taking drugs in double doses (statement number 10).

Next is knowledge about drug side effects; 75% of health students know that taking Paramex® headache medicine can cause drowsiness (statement number 11), and as many as 66.0% of non-health students also know that taking Paramex® headache medicine can cause drowsiness.

Statement number 12 reveals that 91.2% of non-health students are aware that headache medicine should be stored in a place protected from direct sunlight. Statement number 7 (that headache medicine does not have to be stored in the refrigerator) is a negative statement, so it has a "wrong" answer, with a percentage of 86.7% of health students knowing. 86.7% of health students know that statement number 7, which states that headache medicine does not have to be stored in the refrigerator, is incorrect due to its negative nature.

For the sub-variable regarding knowledge about drug expiration dates, the majority of health and non-health students answered correctly on the indicator of the level of knowledge about drug expiration dates; as many as 98.1% of health students and as many as 93.6% of non-health students about that the use of pain medication. If it is expired, then the drug cannot be consumed. These results show that, in general, health students' knowledge level is greater than that of non-health students. This result is in line with research conducted by Irawati et al. regarding the level of knowledge of self-medication of analgesic drugs among students at X University who are in better health compared to non-health students (Irawati et al., 2021).

### 3.3. Behavior

Self-medication behavior with analgesic drugs is categorized into three categories. Behavior that is said to be good if the respondent's score from the questionnaire results ranges from 76-100% is considered sufficient if the value is 56-75% and is categorized as less if the value obtained is <55% (Nursalam, 2020). The behavior of respondents' self-medication can be seen in **Table 3**.

**Table 3.** Self-medication behavior

| Self-medication Behavior | Health | | Non-Health | |
|---|---|---|---|---|
| | (n) | (%) | (n) | (%) |
| Not enough | 3 | 0.8 | 6 | 1.6 |
| Enough | 47 | 12.5 | 66 | 17.5 |
| Well | 326 | 86.7 | 304 | 80.9 |
| Total | 376 | 100 | 376 | 100 |

Based on **Table 3**, it is evident that out of the 376 health student respondents, three respondents (0.8%) exhibit poor behavior, 47 respondents (12.5%) exhibit good behavior, and a significant majority of 326 respondents (86.7%) exhibit moderate behavior. In this case, most health students behave well with self-medicating analgesic drugs. While the results were obtained on the behavior of non-health students, six respondents, with a percentage of 1.6% having poor behavior, 66 respondents, with a percentage of 17.5% having good behavior, and 304 non-health student respondents, with a percentage of 80.9% having a high level of good behavior, it can be concluded that the majority of non-health students also have good behavior towards self-medication of analgesic drugs.

The questionnaire divides the behavioral questions posed to health and non-health students into several sub-variables. The first sub-variable is behavior regarding drug selection according to the symptoms of the disease, statement number 1 (the selection of headache medicine according to the type of headache felt). The results obtained are that 50.0% of health students and 45.0% of non-health students always answered, as many as 28.7% of health students and 22.6% of non-health students often answered, 16.5% of health students and 25.5% of non-health students answered sometimes, and 4.8% of health students and 6.9% of students' non-health answered never. Statement number 2 (regarding taking paracetamol for headaches and toothaches) showed that only 20.0% of health students and 20.0% of non-health students answered "always," 31.4% of health students and 20.7% of non-health students answered "often," 35.1% of health students and 40.2% of non-health students answered "sometimes," and 13.6% of health students and 19.2% of non-health students answered "never."

In the second sub-variable regarding the behavior of choosing drug classes that may be used in self-medication, 37.0% of health students answered "always," 10.6% answered "sometimes," 28.2%, and never 24.2%. For non-health students, 21.8% answered "always," 14.1% answered "often," 34.8% answered "sometimes," and 29.3% answered never. Next is the behavior regarding the proper use of drugs in self-medication; as many as 73.9% of health students and 70.5% of non-health students answered "always," 17.8% of health students and 15.7% of non-health students answered "often," 6.9 % of health students and 10.1% of non-health students answered "sometimes," 1.3% of health students and 3.7% of non-health students answered: that they never read the rules for taking headache medicine on the medicine package before taking medicine. The following statement is to take medicine according to the rules of use listed on the medicine package. As many as 77.4% of health students and 77.9% of non-health students answered "always," 16.2% of health students and 13.6% of non-health students answered "often," 5.6% of health students and 7.2% of non-health students answered health students answered "sometimes", and 0.8% of health students and 1.3% of non-health students answered never. The third statement in this sub-variable is that students take more than two tablets in one drink. 95.7% of health students and 93.1% of non-health students answered "never," 3.2% of health students and 4.8% of non-health students answered "sometimes," 0.5% of health students and 0.5 % of non-health students answered often, and 0.5% of health students and 1.6% of non-health students answered always.

The following behavior is about being aware of side effects: as many as 42.0% of health students and 42.6% of non-health students answered "always," as many as 30.3% of health students and 25.8% of non-health students answered "often," as many as 24.2% of Student's Health and 28.2% of non-health students answered "sometimes," and 3.5% of health and non-health students answered that they had never read the information on drug side effects listed on the drug packaging before taking anti-pain medication.

The fifth (regarding behavior) is regarding proper drug storage; the first statement (storing medicines in the refrigerator); 80.6% of health students and 83.0% of non-health students answered "never". As many as 13.0% of health students and 9.6% of non-health students answered "sometimes," 4.5% of health students and 2.1% of non-health students answered "often"

and, 1.9% of health students and 5.3% of non-health students always kept medicines painkillers in the refrigerator. The following statement stated that as many as 85.4% of health students and 78.7% of non-health students were correct in storing medicine (headache medicine should be stored in a place that was protected from direct sunlight), 7.5% of health students and 13.6% of non-health students often store headache medicine in a place that is protected from direct sunlight, 2.4% of health students and 2.1% of non-health students sometimes store medicine in the right place, and 4.8% of health and medical students 5.6% of non-medical students never store medicine in a place that is protected from sunlight.

The last question is about the behavior of being aware of drug expiration dates. on average, respondents always check the expiration date of drugs before taking drugs (85.4% of health students and 82.2% of non-health students), 11.2% of health students and 11.7 % of non-health students check the expiration date of drugs before taking them, as many as 2.9% of health students and 4.5% of non-health students sometimes see the expiration date of drugs before taking them. As many as 0.5% of health students and 1.6% of non-medical students' health workers never check the drug's expiration date before the drug is taken. The result of this study is in line with research by Apsari et al. regarding the behavior of health and non-health student respondents who have values that are not much different, namely good behavior, because knowledge, experience, attitudes, beliefs, beliefs, values, physical condition influences a person's behavior, and a person's mental state as well as many other influences that not everyone experiences. Because many factors influence behavior, not only the level of knowledge, this causes similarities in levels of behavior (Apsari et al., 2020).

### 3.4. Differences in Self-Medication Knowledge and Behavior

*Mann-Whitney* test determines differences in knowledge between health and non-health students on analgesic self-medication. The results of the Mann-Whitney test of respondents can be seen in **Table 4**.

**Table 4.** Mann-whitney test results knowledge level

| | **Knowledge level** |
|---|---|
| *Asym. Sig* | 0.000 |

In **Table 4**, the test results obtained a significance value of 0.000 <0.05, the hypothesis decision is H0 is rejected, so the results obtained are differences in knowledge between health and non-health students on analgesic self-medication.

*Mann-Whitney* determines differences in behavior between health students and non-health students towards analgesic self-medication. In **Table 5**, the test results obtained a significance value of 0.001 < 0.05, so the hypothesis decision is H0 is rejected so that the results obtained are differences in behavior between health and non-health students towards analgesic self-medication.

**Table 5.** Mann-whitney test results behavior

| | **Behavior** |
|---|---|
| *Asym. Sig* | 0.001 |

The results of this study are based on Apsari et al. 's research on the knowledge and practice of self-medication carried out among Bali International University students, which stated that there were significant differences in the level of knowledge between health and non-health students. Health Students have a higher level of knowledge. The difference in knowledge is because non-health students need help understanding drug-related problems. Similar research in Saudi Arabia by Eissa also showed similar results, where pharmacy students had a better level of knowledge because they received lectures about medicine (Apsari et al., 2020; Eissa, 2013).

### 3.5. Relationship between Knowledge Level and Self-Medication Behavior

Spearman Rank correlation test determines the relationship between knowledge and behavior of self-medication analgesic health students. From **Table 6** it can be seen that the test results obtained the calculated r value of 0.107 and the significance value (P value) of 0.039 <0.05, it can be concluded that H0 is rejected and Ha is accepted, which means that there is a relationship between the level of knowledge and behavior of self-medication of analgesic drugs for health students.

**Table 6.** Results of the spearman rank correlation test for health students

| r count | Sig. | Decision |
|---|---|---|
| 0.107 | 0.039 | Reject $H_0$ / Accept Ha |

Spearman Rank correlation test in **Table 7** shows the calculated r-value of 0.114 with a significance value (P-value) of 0.027 <0.05; it can be concluded that H0 is rejected and Ha is accepted, which means there is also a relationship between the level of knowledge and behavior of students' self-medication of analgesic drugs.

**Table 7.** Results of the spearman rank correlation test for non-health students

| r count | Sig. | Decision |
|---|---|---|
| 0.114 | 0.027 | Reject $H_0$ / Accept Ha |

It shows that the relationship between knowledge level with behavior in self-medication drug analgesics is weak, significant, and directly proportional. The better the level of knowledge, the better the self-medication behavior of drug analgesics will be, and the better. On the contrary, if the level of knowledge is low, then the behavior of self-medication of Analgesic Drugs is lower, with a reasonably low probability for non-health students at the University of Muhammadiyah Yogyakarta. According to previous research on the relationship between the level of knowledge and behavior in students, if the level of student knowledge increases, student behavior will also increase (Perkasa et al., 2020).

## 4. CONCLUSION

There is a significant difference in the level of knowledge in analgesic self-medication between health and non-medical students at Muhammadiyah Yogyakarta University, with the analysis results on the Mann-Whitney test showing a sig. 0.000. There are behavioral differences in analgesic self-medication between health and non-health students at the University of Muhammadiyah Yogyakarta, which is quite significant, with the results of the analysis on the Mann-Whitney test showing a sig value. 0.001. There needs to be a stronger relationship between the level of knowledge and behavior of health and non-health students of the Muhammadiyah University of Yogyakarta.

## 5. ACKNOWLEDGMENT

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## 6. CONFLICT OF INTEREST

All authors declare no conflict of interest.

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