

# Antibiotics self-medication practices among students in Universitas Prima Indonesia

Erida Novriani<sup>1</sup>, Elfia Neswita<sup>1</sup>, Razoki<sup>1\*</sup>

## Abstract

The irrational use of antibiotics can endanger health by causing unwanted drug reactions, side effects, and drug resistance. This study aimed to analyze the patterns of antibiotic self-medication among university students. This descriptive cross-sectional study was conducted at Prima Indonesia University in October 2023. A total of 307 randomly selected students from various faculties (health science clumps and non-health science clumps) filled out questionnaires distributed via Google Forms. The collected data are then analyzed descriptively to obtain frequency and percentage data, which are then presented in the form of tables and narratives. The results showed that about 83.39% of respondents had used antibiotics before. Most respondents used antibiotics because they were easily available (43.36%) or because of their previous experience (36.72%). The most common conditions for antibiotic use were cough and cold (47.66%), and infections (23.05%). Most respondents used antibiotics based on doctor's or pharmacist's recommendations (45.31%). The duration of antibiotic use was 1-3 days (61.72%), followed by 4-7 days (31.64%) and more than 7 days (6.64%). Antibiotics were purchased from pharmacies (83.20%). The most common reactions to the overuse of antibiotics were nausea and vomiting (40.23%) and headache (32.81%). Most respondents (53.13%) consulted a doctor or pharmacist if they experienced reactions to antibiotic overuse.

**Keywords:** antibiotics, self-medication, university students

## Introduction

Self-medication is a global phenomenon that can contribute to the resistance of human pathogens to antibiotics, the risk of adverse drug reactions, drug-drug interactions, and increased morbidity.<sup>1,2</sup> The irrational use of antibiotics and lack of knowledge have led to an increase in antibiotic resistance.<sup>3</sup> Antibiotic resistance can occur because of the use of antibiotics that are not in accordance with doses and warnings, as well as contributions from health workers. Antibiotics are a class of hard drugs that require a doctor's prescription, and their improper use can lead to harmful effects and resistance.<sup>4,5</sup> Self-medication refers to the consumption of drugs by individuals based on their own judgment without consulting a doctor for either diagnosis or prescription.<sup>6</sup> The implementation of self-medication must meet the criteria for rational drug use, including the accuracy of the drug class, accuracy of drug selection, accuracy of drug dosage, absence of side effects, absence of contraindications, and absence of drug interactions. Self-medication is usually performed to treat minor complaints and illnesses, such as fever, pain, dizziness, cough, stomach ulcers, diarrhea, skin diseases, constipation and others.<sup>7</sup> However, self-medication only involves non-prescription products or over-the-counter drugs that are easily available at pharmacies, supermarkets, and other outlets. Self-medication also provides an opportunity for the practice of selling drugs by illegal drug providers which has implications for irrational and potentially dangerous drug use.<sup>8,9</sup>

Antibiotic use was also prevalent among students. A study in Tanzania reported a high prevalence of antibiotic self-medication in university students and no significant difference between medical and non-

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## Affiliation

<sup>1</sup>Department of Clinical Pharmacy, Universitas Prima Indonesia

## Correspondence

razoki@unprimdn.ac.id

medical students.<sup>10</sup> High rates of antibiotic self-medication were also reported in a study in Peru, and there was a possible association with female gender. However, no association was found between antibiotic self-medication and age, prior knowledge of antibiotics, health science program, or year of study.<sup>11</sup> However, a study in Malaysia reported a low rate of self-medicated antibiotic use among university students.<sup>12</sup> In Indonesia, a report published by Indonesian Central Statistic Agency showed that the prevalence of self-medication reached 84.23% in Indonesian society.<sup>13</sup> There is no report on specific statistics of self-medication among university students, but several previous studies reported varying prevalence of self-medication in several universities in Indonesia. Research conducted at Universitas Mataram reported a high prevalence of self-medication by first-year students (90.02%).<sup>14</sup> The results of research on nursing students at Universitas Padjajaran showed that most respondents performed self-medication with antibiotics irrationally. The majority of respondents used antibiotics when prescribed (88%) and more than half of the respondents spent the prescribed antibiotics (69%).<sup>15</sup> Research at Universitas Bali International showed that the prevalence of self-medication in pharmacy students reached 77.4%. Health students often practice self-medication because of their higher level of education and wider knowledge of health, medicine, and disease. On the other hand, non-health students are considered to have low knowledge about self-medication due to the lack of association with the health field in their education.<sup>16</sup>

From the above, it appears that special attention needs to be paid to the practice of self-medication with antibiotics, especially among university students, and to the importance of a more holistic approach in addressing this issue. Studies on the use of antibiotics for self-medication among students at Universitas Prima Indonesia are limited. Universitas Prima Indonesia has diverse students from both regional origins and faculties. This study is expected to describe the use of antibiotics in self-medication and increase students' understanding of the wise and rational use of antibiotics to reduce the risk of side effects and antibiotic resistance.

## Method

This descriptive cross-sectional study was conducted at Universitas Prima Indonesia in October 2023. A total of 458 students were randomly selected from various faculties: both faculties with health science clumps and non-health science clumps. The criteria for eligible samples included being registered as Universitas Prima Indonesia students, having used antibiotics in self-medication, and being willing to become respondents. The respondents completed a questionnaire provided via Google Forms. The questionnaire consisted of questions on sociodemographic aspects and knowledge levels. Sociodemographic aspects included the respondents' name, age, gender, faculty, and place of residence. The level of knowledge about antibiotics includes indications, dosage regimens in terms of frequency and duration of administration, resistance, sources of obtaining antibiotics, and side effects. The collected data were then analyzed descriptively to obtain frequency and percentage data. The data are presented in the form of tables and narratives.

## Results and Discussion

Antibiotics are chemical substances produced by fungi and bacteria that can inhibit or kill germ cells with relatively low toxicity. Antibiotics are indicated for diseases caused by bacterial infections; therefore, the administration of antibiotics is recommended for patients suffering from symptoms due to bacterial infections.<sup>17,18</sup> The irrational use of antibiotics is often self-medication. The irrational use of antibiotics including inappropriate indication, inappropriate drug, inappropriate dose, and inappropriate duration can cause side effects and resistance to antibiotics.<sup>19,20</sup> This study aimed to analyze the pattern of antibiotic self-medication among university students. The response rate for filling out the questionnaire via Google Forms reached 67.3% (307 respondents).

Table 1. Characteristics of respondents (n=307)

Characteristics	n	%
Gender		
Male	117	38,11
Female	190	61,89
Age		
<19 years	203	66,12
≥19 years	104	33,88
Faculty		
Health	186	60,59
Non-health	121	39,41
Residence		
Medan	179	58,31
Outside Medan	128	41,69
Ever used antibiotics		
Yes	256	83,39
No	51	16,61

Table 2. Pattern of antibiotic self-medication (n=256)

No	Statement	n	%
1	What are your reasons for using antibiotics independently?		
	a. Cheap	16	6,25
	b. Easy to get	111	43,36
	c. Lazy to see a doctor	35	13,67
	d. Previous experience	94	36,72
2	Under what conditions do you use antibiotics?		
	a. Cough and cold	122	47,66
	b. Sore throat-toothache	23	8,98
	c. Infection	59	23,05
	d. Fever	52	20,31
3	Antibiotic use was based on:		
	a. Recommendation by doctor/pharmacist	116	45,31
	b. Advice from friends or family	70	27,34
	c. Previous experience	59	23,05
	d. Internet, social media	11	4,30
4	How long have you been using antibiotics for?		
	a. 1-3 days	158	61,72
	b. 4-7 days	81	31,64
	c. more than 7 days	17	6,64
5	Do you always read medicine packaging before use?		
	a. Yes	207	80,86
	b. No	49	19,14
6	Where do you buy antibiotics for self-medication?		
	a. Pharmacy	213	83,20
	b. Leftover from previous prescription	31	12,11
	c. Store	12	4,69
7	Reactions experienced if antibiotics were overused:		
	a. Redness (itching)	53	20,70
	b. Swelling	16	6,25
	c. Headache	84	32,81
	d. Nausea and vomiting	103	40,23
8	What do you do if you experience this?		
	a. Consult a doctor/pharmacist	136	53,13
	b. Stop taking antibiotics	103	40,23
	c. Change the type of antibiotic	12	4,69
	d. Using antibiotics 2 times the previous dose	5	1,95

Approximately 83.39% of the respondents had used antibiotics before, indicating that antibiotic use is a common practice among university students. The majority of respondents were female (61.89%) and under 19 years old (66.12%). The majority of the respondents were students from health faculties (60.59%), and based on residential addresses, most respondents resided in Medan.

Table 2 shows the pattern of antibiotic use in self-medication by 256 respondents. Reasons for using antibiotics independently were easy to obtain (43.36%) and previous experience (36.72%). In a study in Surabaya, the most influential factor in the use of antibiotics without a prescription was the ease of access to antibiotics.<sup>21</sup> Widayati et al.<sup>22</sup> reported that 64% of antibiotics were obtained from pharmacies without a prescription in Yogyakarta. A literature review also found that the ease of buying antibiotics without a prescription was a strong reason for antibiotic self-medication.<sup>23</sup> Another study also reported that a person's experience in dealing with the same symptoms when suffering from illness is the reason individuals buy antibiotics without a doctor's prescription.<sup>24</sup> Another study reported as many as 56.50% of patients did antibiotic self-medication because they had used antibiotics before.<sup>25</sup>

The results of this study also showed that the majority of respondents obtained or purchased antibiotics without a prescription at a pharmacy (83.20%). This condition is common in developing countries, and can be caused by the implementation of less stringent drug policies in the healthcare system.<sup>23</sup> Nevertheless, this study found that the majority of respondents always read drug packaging to avoid mistakes in using drugs (80.86%). However, this does not guarantee that antibiotics are used rationally (dose and use) because of limited medical knowledge and the rationality of drug consumption. In addition, there is a possibility of discontinuing antibiotic therapy before completing the entire program.<sup>26</sup> This condition was also observed in this study population. Most of the respondents used antibiotics for 1-3 days (61.72%). The respondents stopped taking antibiotics due to symptom improvement. However, some studies have stated that longer antibiotic use is more likely to cause the emergence of resistant bacteria.<sup>27,28</sup> Nevertheless, health workers still play an important role in educating patients not to share or store antibiotics for future use and return unused antibiotics to the pharmacy for disposal. This study also found that the majority of the students used antibiotics based on doctor/pharmacist recommendations (45.31%). Llewelyn et al.<sup>29</sup> emphasized the importance of the role of doctors and other health workers in providing education about the dangers of excessive antibiotic use and minimizing antibiotic self-medication.

The majority of respondents suggested that antibiotics should be used to treat coughs and colds (47.66%). Respondents thought antibiotics were effective in treating mild symptoms, such as cough, cold, sore throat, and fever. The use of antibiotics was also considered to accelerate recovery. Similar findings were also reported in research conducted by Elmahi et al.<sup>30</sup> at several universities in Sudan. A total of 30.4% of the students used antibiotics to treat coughs, and 38.1% used antibiotics to treat upper respiratory tract

symptoms. Some studies state that taking antibiotics to treat a cold or flu is not beneficial, as antibiotics are ineffective against viral infections and can cause unpleasant side effects. In many cases, the immune system can overcome such mild infections.<sup>31–34</sup> The majority of respondents stated that they consulted a doctor/pharmacist (53.13%) or stopped taking antibiotics (40.23%) if they experienced side effects. The most common side effects experienced by respondents were nausea and vomiting (40.23%). A study in Iran reported that 29.7% of students self-medicated with antibiotics experienced nausea/vomiting. Sleep problems, allergic reactions, and headaches were also the most commonly reported side effects.<sup>35</sup> In South Korea, several studies reported antibiotics as the most common cause of adverse drug reactions.<sup>36,37</sup>

Various studies have formulated evidence-based measures to address the issue of antibiotic self-medication. Educating the public about the risks of self-medication with antibiotics and the importance of using antibiotics only when prescribed by a healthcare professional. In addition, it is necessary to strengthen regulations on the sale of antibiotics without a prescription and enforce existing laws to prevent the over-the-counter sale of antibiotics.<sup>38,39</sup> Other studies have suggested providing training to healthcare providers to ensure appropriate antibiotic prescription practices and to communicate the risks of antibiotic self-treatment to patients.<sup>40–42</sup> These measures are essential to address the problem of antibiotic self-treatment and its associated risks, including the development of antibiotic resistance.

## Conclusion

In this study, antibiotic use was common among the students (83.39%). Students practiced self-medication because antibiotics are readily available and can be purchased without a doctor's prescription at pharmacies. The majority of respondents used antibiotics for 1-3 days and stopped taking antibiotics due to symptom improvement. They reported that the most common side effects were nausea, vomiting, and allergic reactions, such as redness and itching. Education on the risks of self-medication with antibiotics and the importance of using antibiotics only when prescribed by a healthcare professional needs to be conducted routinely and on a wide scale.

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