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Research Article

Evaluation of the Level of Knowledge, Attitudes, and Behavior of High School Students in the City of Pekanbaru in the Use of Antibiotics

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ABSTRACT

The high use of antibiotics in the community will lead to resistance. According to the results of studies in Indonesia, the problem of antibiotic resistance is very complex and will continue to increase every year. Infectious diseases account for more than 13 million deaths per year in developing countries. Wise and rational use of antibiotics can reduce the disease burden, especially infectious diseases. Conversely, the widespread use of antibiotics that do not match the indications significantly increases antibiotic resistance. Students must know the proper use of antibiotics so as not to develop antibiotic resistance. They do not know much or fully understand antibiotics during the transition from childhood to adulthood. This study aims to determine the relationship between knowledge, attitudes, and behavior of SMAN Se-Kota Pekanbaru students in the use of antibiotics. This research uses a descriptive survey method with 360 respondents. Data analysis was done using a chi-square test with a significance level of $p < 0.05$. The results of this study showed that there were students with good knowledge (67%), with some who showed a positive attitude (75%), and less behavior in the use of antibiotics (74%). The chi-square test showed a significant relationship between attitudes and antibiotic use behavior with a p-value of 0.001 ($p > 0.005$). While the level of knowledge and attitude had a p-value of 0.605 ($p > 0.05$) and the level of knowledge and behavior had a p-value of 0.118 ($p > 0.05$), indicating there was no significant relationship. From the results of this study, it can be concluded that there is no significant relationship between students' knowledge with attitudes and behavior in the use of antibiotics, and there is a significant relationship between attitudes and student behavior in the use of antibiotics.

INTRODUCTION

The high use of antibiotics in the community will result in antibiotic resistance. If you use antibiotics well, you will get rational therapy. However, if not used rationally, the use of antibiotics will result in antibiotic resistance (Wulandari and Rahmawardany, 2022). Irrational use is an important factor that causes the high rate of antibiotic resistance. Lack of public knowledge about antibiotics will affect health behaviors and attitudes. Knowledge has a very important role in forming beliefs and attitudes regarding certain behaviors (Ivoryanto *et al*., 2017). The prevalence of antibiotic use rates is high, at 40%–60%. Improper use of antibiotics can trigger antibiotic resistance. Antibiotic resistance has a negative impact, such as increased mortality (Siti, 2019).

Student behavior when taking antibiotics will be influenced by a person's knowledge and attitude toward using antibiotics (Notoadmodjo, 2014). Arithmetic knowledge is very important to many people, and one of them is high school students. If the level of knowledge about

antibiotics is low, consuming them improperly can cause a decrease in quality of life, especially in health. Improper use of antibiotics can often cause a person to get sick or not heal. Drugs that are misused and used more than intended can even cause death (Syafitri, 2018). Improper use of antibiotics can cause health problems and also pose a threat to global health, especially bacterial resistance to antibiotics. Resistance is the ability of bacteria to neutralize and weaken the action of antibiotics. Resistance is one of the biggest health problems currently because it can lead to an increase in mortality. Abuse of these antibiotics can lead to a lack of proper knowledge of antibiotics.

Accordingly, the researchers chose high school students as research subjects because adolescent students are in a transition from being children to becoming adults. Adolescents do not fully understand antibiotics, so it is hoped that after their education, they can change their attitudes towards antibiotics to minimize the incidence of antibiotic resistance. Good knowledge about antibiotics is needed (Yulia, 2019).

MATERIAL AND METHODS

The research used in this study is In this study, quantitative research was conducted with descriptive methods. This type of survey study is used to explain the relationship between two or more variables. The sampling method used is non-random sampling with a sampling technique, namely quota sampling. Ethical permission was obtained from the Health Research Ethics Committee, College of Health Sciences Payung Negeri Pekanbaru, with No. 111/ STIKES PN/KEPK / VII / 2023 with the main research protocol titled: Evaluation of the Level of Knowledge, Attitudes, and Student Behavior in the Use of Antibiotics in High Schools Throughout the City of Pekanbaru.

The sample size was determined using the Slovin Formula. With the estimated population of SMAN Se-Kota Pekanbaru as many as 3,621, the number of samples taken based on the formula is 360 students.

The instrument used in this study was the distribution of questionnaires containing structured questions that gave respondents the option to choose answers provided regarding knowledge, attitudes, and behaviors of antibiotic use. The questionnaire has 19 questions divided into three categories. 6 questions about students' knowledge of antibiotic use, seven questions about students' attitudes toward antibiotic use, and six questions about students' behavior in antibiotic use. This questionnaire was adopted from Knowledge, Attitudes and Practices of Antibiotics: a questionnaire study among 2500 Chinese students (Huang *et al.*, 2013). This questionnaire was translated into Indonesian according to the established procedure. Then, the validity and reliability of 30 respondents with acceptance parameters were tested through the Pearson Product Moment and Cronbach's Alpha correlation tests.

RESULTS AND DISCUSSION

Validity and reliability

The questionnaire instrument was tested for validity and reliability first, with 30 respondents with the same criteria as the sample to be selected in the study. Based on the statistical analysis of the data obtained, all question items are valid and reliable, with Pearson correlation values > 0.361 and Cronbach's alpha > 0.6.

Characteristics of respondents

Respondents in this study were categorized by gender and age. Of the 360 respondents given the questionnaire, all gave answers to the questionnaire that had been given. As shown in Table 1, respondents aged between 16 and 18 years, with a dominant age of 17, are 55%, and as many as 65% of respondents are women.

Distribution of Respondents' Knowledge, Attitudes, and Behavior.

Table 2 shows 242 (67%) respondents knew about the use of antibiotics. This research is in line with research conducted by Oktaviani in 2021, which found that the level of knowledge of respondents in the use of antibiotics is good, as many as 165 (78.6%). The results of this study are related to Hasnal's research dedication in 2015 to the community in Seberang Pebayan RW IV Kelurahan Batang Arau Padang Selatan, where most respondents can be said to be well-informed knowledge results from knowing that someone is curious about a particular object (Fitriani, 2011). Someone must be given a stimulus in advance in the form of information on how to use antibiotics rationally. The more facilities that are owned will allow someone to receive more information because the knowledge they have will increase so that they can gain new knowledge and can respond in a certain attitude towards the information they are interested in and then will cause a distant response, namely the occurrence of action in the rational use of antibiotic drugs (Notoadmodjo, 2010).

Table 1. Questionnaire Validity (n=30)

Question item no	R Count	R Table	Decision
1	0.659	0.361	Valid
2	0.405	0.361	Valid
3	0.622	0.361	Valid
4	0.397	0.361	Valid
5	0.395	0.361	Valid
6	0.563	0.361	Valid
7	0.588	0.361	Valid
8	0.551	0.361	Valid
9	0.513	0.361	Valid
10	0.509	0.361	Valid
11	0.411	0.361	Valid
12	0.46	0.361	Valid
13	0.454	0.361	Valid
14	0.509	0.361	Valid
15	0.513	0.361	Valid
16	0.451	0.361	Valid
17	0.382	0.361	Valid
18	0.547	0.361	Valid
19	0.375	0.361	Valid

Table 2 shows that respondents' attitudes were positive for 269 respondents (74%). This result is in line with the research conducted by Dzakiyah in 2022, which shows that the research results indicate that as many as 121 respondents (86.4%) have good attitudes towards non-medical students. The results of this study are in line with the research conducted by Haryanto in 2023, where the results of the study showed that (54%) of respondents were able to achieve good antibiotic use. These results indicate that most respondents can explain the correct use of antibiotics well (Efendi, 2020). However, one's attitude cannot prevent someone from taking antibiotics without a prescription (Yarza *et al.,* 2015). According to Dewi and Farida (2018), a person's attitude can change due to several factors, one of which is a person who conveys a message and the message content is presented as a proposal. According to the results of the research, there are still many students who do not have a positive attitude towards the use of antibiotics so that the role of mass media is needed. Community health service institutions need to provide counseling about antibiotics as a proposal in improving regulations on the use of antibiotics (Wawan and Dewi, 2010).

Table 2 shows that the behavior of respondents is categorized as less than 265 respondents (74%). This study is in line with research conducted by Kusno *et al*. in 2023; the results of the study found that (44%) of respondents had poor behavior in the use of antibiotics. Respondents' awareness of stimuli often influences antibiotic use behavior due to previous experience that if antibiotics are taken, the patient will soon recover from the disease (Fernandez, 2013). According to Notoatmodjo, several factors influencing a person's behavior are predisposing factors (knowledge, attitudes, beliefs, and perceptions). There also are supporting factors (access to health services, skills). Behavior is a response or reaction of a person to a stimulus, either directly or indirectly (Notoatmodjo, 2014). The results showed that students had sufficient knowledge about the use of antibiotics, which influenced their behavior of using antibiotics (Fauzia, 2019).

Table 2. Reliability

Question item no	R Count	R Table	Decision
1	0.809	0.6	Relliable
2	0.823	0.6	Relliable
3	0.811	0.6	Relliable
4	0.824	0.6	Relliable
5	0.824	0.6	Relliable
6	0.814	0.6	Relliable
7	0.810	0.6	Relliable
8	0.815	0.6	Relliable
9	0.815	0.6	Relliable
10	0.814	0.6	Relliable
11	0.820	0.6	Relliable
12	0.820	0.6	Relliable
13	0.817	0.6	Relliable
14	0.818	0.6	Relliable
15	0.815	0.6	Relliable
16	0.820	0.6	Relliable
17	0.822	0.6	Relliable
18	0.812	0.6	Relliable
19	0.825	0.6	Relliable

Table 3. Distribution of respondents according to respondent characteristic

Variable	N	%
Gender		
woman	234	65%
Man	126	35%
Sum	360	100%
Age		
16 Years	97	27
17 Years	199	55
18 Years	64	18
Sum	360	100%

Relationship of Knowledge Level with Antibiotic Use Attitudes

Table 3 shows there is no significant relationship between respondents' knowledge and antibiotic use attitudes. From the statistical analysis results, we obtained a p-value of 0.605 ($p < 0.05$). Thus, this indicates that H0 is rejected and there was no statistically significant correlation between the students' level of knowledge and attitude in the use of antibiotics. The findings in this study are in line with research conducted by Oktaviani in 2021, where this study showed that the level of knowledge was not related to attitudes toward the use of antibiotics ($p > 0.05$). This study is not in line with Theodorus Gray's research, which suggests a relationship between knowledge and attitudes regarding the use of antibiotics.

In theory, attitudes and actions are influenced by the level of individual knowledge about something. However, some factors still influence attitudes and actions, such as beliefs, experiences, and values that prevail in society. The attitudes and actions of students are also strongly influenced by environmental factors, so it often occurs in people with a good level of knowledge as they do not match the influence of friends or the experiences of friends around them. In addition, the progress of the times that makes it easier for individuals to find information also affects students' knowledge levels (Widyatum *et al*., 2019).

The Relationship of Knowledge Level with Antibiotic Use Behavior

This research is in line with the research conducted by Waskitajani in 2014, which showed that there was no significance result of 0.836 (>0.05). This finding indicates there is no relationship between knowledge and antibiotic treatment behavior, so it can be said that the actions of a person do not have to be based on the knowledge they have. According to Zahra *et al*.'s 2022 research, the results did not show a meaningful relationship between knowledge and behavior of antibiotic use in students. Based on research conducted by Fitriah and Mardiati in 2021, it was stated that the factor that can contribute to a large number of antibiotics uses without a doctor's prescription or direct purchase is the economic level. People with low economic levels tend to buy antibiotics without a prescription because it can save costs to see a doctor. The producer will greatly affect the self-treatment that a person will do and will affect a person's mindset in drug selection decisions (Fitriah and Mardiati, 2021).

This result is similar to previous studies winch found a p value of 0.836 (>0.05), which means there is no relationship between knowledge and knowledge of antibiotic use, so it can be said that a person's behavior does not have to be based on knowledge they have (Angelina and Tjandra, 2019). This signifies that the respondent shares the behavior, but the behavior can be mediated by knowledge. This finding aligns with the theory of predisposing factors (predisposing factors), which states that knowledge alone is not enough to cause individual behavior change but also requires health awareness before behavior occurs (Khalid, 2014).

The absence of a relationship between knowledge and use behavior can occur because many factors influence antibiotic use behavior. First, environmental factors, namely the importance of good delivery from health workers, so that someone tends to be obedient and rational in using antibiotics. The second factor is trust. Trust is a cognitive component and a socio-psychological factor. For example, a person believes that a doctor or health worker can help to cure their disease, so they tend to obey the doctors' words. The third factor is habit. Habits are sedentary, occurring automatically and unplanned (Notoatmodjo, 2014).

The Relationship of Attitude with Antibiotic Use Behavior

Tables 4-7 show that the results of the statistical analysis obtained a p-value of 0.001 ($p < 0.05$). Thus, H0 was rejected, and H1 was accepted, indicating there was a statistically correlation between levels of attitude and behavior in antibiotic use. Research conducted by Yarza in 2015 this study is in line with that shows a significant relationship between attitudes and behaviors toward antibiotic use ($p < 0.05$). Research conducted by Shehadeh in 2012 stated that a significant relationship exists between attitudes and behavior of antibiotic use in adults in Jordanian society. Meanwhile, a study conducted by Alqarni in 2019 stated that a positive attitude regarding antibiotic use also showed good behavior.

Meanwhile, a study by Mardiati *et al*. in 2021 stated that although attitudes towards antibiotic use had a positive impact of 97.4%, but there was no significant relationship between knowledge and attitudes about antibiotic use. This is due to several factors, namely, most people still do not have good knowledge about

antibiotics. However, attitudes are also influenced by other factors, such as culture and environment (Fitriani, 2011). Action formation can also be influenced by beliefs and traditions that develop in the community, so sometimes people have high knowledge and good attitudes. However, their actions in taking drugs are still irrational (Madian, 2022).

Table 4. Knowledge Level of Respondents' Attitudes and Behavior

Variable	Sum	Percentage
Level of knowledge about antibiotics		
Less	118	33 %
Good	242	67%
Total	360	100%
Antibiotic Use Attitude		
Positive	269	75%
Negative	91	25%
Sum	360	100%
Antibiotic Use Behavior		
Less	265	74%
Good	95	26%
Sum	360	100%

Table 5. Relationship of Knowledge Level with Antibiotic Use Attitudes

No	Knowledge	Attitude				Sum	
		Negative		Positive			
		N	%	N	%	N	%
1	Less	18	5.0%	93	25.8%	111	30.8%
2	Good	46	12.8%	203	56.4%	249	69.2%
Sum		64	17.8 %	296	82.2%	360	100
P Value		0.605					

Table 6. The Relationship of Knowledge Level with Antibiotic Use Behavior

No	Knowledge	Behavior				Sum	
		Less		Good			
		N	%	N	%	N	%
1	Less	58	16.1 %	53	14.7 %	111	30.8 %
2	Good	152	42.2 %	97	26.9%	249	69.2%
Sum		210	58.3%	150	41.7%	360	100
P Value		0.118					

Table 7. Relationship of Attitude with Antibiotic Use Behavior

No	Attitude	Behavior				Sum	
		Less		Good			
		N	%	N	%	N	%
1	Negative	25	6.9%	39	10.8%	64	17.8%
2	Positive	185	51.4%	111	30.8%	296	82.2%
Sum		210	58.3%	150	41.7%	360	100%
P Value		0.001					

CONCLUSION

Based on the results of research on 360 students on the use of antibiotics, it can be concluded that as many as 242 students have good category knowledge, 269 students have a positive attitude toward using antibiotics, and 265 students behave poorly in the use of antibiotics. Using the chi-square statistical test, there was an insignificant relationship between knowledge and attitude and behavior of students in the use of antibiotics, and there was a significant relationship between attitude and behavior of antibiotic use in students. Environmental factors influence the attitude and behavior of students, so as it happens to a person with a good level of knowledge along with the following, they take inappropriate actions, with the influence of friends or the experience of surrounding friends. Accordingly, a person's actions do not have to be based on their knowledge, while attitude means the amount of positive or negative feelings towards a thing, object, person, institution, or activity. Generally, if a person believes and feels that doing a behavior will produce a positive output, they will have a positive attitude, and vice versa.

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