The Correlation Between Knowledge and Behavior in Antibiotic Use in Martapura District

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ABSTRACT

Irrational use of antibiotics can cause various negative impacts on health, one of negative impacts is the occurrence of antibiotic resistance. Good knowledge of antibiotics is needed by individuals because it is one of the factors that can affect the behavior of using antibiotics. This study supports WHO's policy of fighting antibiotic resistance through exploring community knowledge and behavior. This study aimed to determine the relationship between knowledge and behavior in the use of antibiotics in the people of Martapura District. This study was analytical observational with a cross-sectional approach. The sampling technique used was quota sampling with the number of respondents involved as many as 110 people in Martapura District who had used antibiotics. The instrument used was a questionnaire that has been tested for validity and reliability. Data analysis was performed using Rank Spearman correlation test. The results showed that majority of respondents were female (66,36%) with an age range of 38-47 years (30,91%), the last education was SMA/SMK (47,27%) and a job as a housewife (37,37%). The results of measuring the level of public knowledge about antibiotics are low (5.45%), medium (85.45%), and high (9.09%) categories. While the category of community behavior in using antibiotics is positive (64.55%) and negative (35.45%). The conclusion from the correlation test results obtained a p value of 0,307, which means that there was no relationship between knowledge and behavior in using antibiotics in the people of Martapura District.

Keywords: Antibiotic use, Behavior, Knowledge, Public

INTRODUCTION

Occupational Health and Safety (OHS) is our effort to create a healthy and safe work Widespread and persistent use of antibiotics leads to a number of issues, including decreased antibiotic efficiency and antibiotic resistance. Antibiotic resistance is a pressing issue on a global scale. By 2050, antibiotic-resistant bacteria are predicted to be the cause of 10 million annual fatalities (Belkaid and Segre, 2014). Due to higher healthcare expenditures an unneeded prescription use, antibiotic resistance causes thousands of fatalities each year as well as financial losses (Marzan et al., 2021).

The incidence of antibiotic resistance is currently on the rise. According to the findings of the survey, the region with the highest prevalence of antibiotic resistance is Southeast Asia, particularly in the context of Staphylococcus aureus infections that exhibit resistance to Methicillin (Morrison and Zembower, 2020). Antibiotic resistance is influenced by a multitude of causes, among which the irrational utilization of antibiotics stands as a significant contributor. According to the findings of Syarif's study, a notable proportion of the population in Banjarbaru city, namely 59.46%, have been seen to engage in the utilization of antibiotics. This behavior is mostly attributed to the convenient accessibility of these medications through local pharmacies. Consequently, this accessibility factor has been identified as a contributing factor to the irrational utilization of antibiotics within the community (Rizaldi, 2020).

The appropriate use of antibiotics is influenced by numerous factors, including knowledge. According to Tamayanti, D.M. Sari, and Dewi's research shows that individuals with a limited knowledge of antibiotics may exhibit inappropriate behavior as a result of misconceptions (Tamayanti, D.M. Sari and Dewi, 2016). The findings of the study indicate a significant lack of public awareness regarding antibiotics, particularly in relation to antibiotic resistance. This is demonstrated by the common practice of individuals utilizing antibiotics to

treat ailments such as sore throats, the flu, coughs, and fever. In addition, a study conducted by Nasif et al. revealed that a significant proportion of individuals, specifically 43%, engage in the practice of self-medication by purchasing identical antibiotics for the treatment of a certain ailment without seeking professional medical advice (Nasif et al., 2021). According to Cheng et al., there is a prevailing belief among individuals that viral illnesses can be identified through the use of antibiotics (Cheng et al., 2018). Therefore, the World Health Organization (WHO) advocates for the implementation of a campaign aimed at enhancing public knowledge and promoting appropriate behavioral practices regarding the use of antibiotics (Pratiwi, Wiyono and Jayanto, 2020).

To maximize the therapeutic efficacy of antibiotics, it is crucial to have a thorough understanding of how to use them and to practice responsible behavior when doing so. The amount of education is a significant determinant of antibiotic knowledge, although both knowledge and income have a role in shaping antibiotic usage behavior. Previous studies have posited that a connection between knowledge and behavior does not exist. However, recent research conducted by Angelina and Tjandra, suggests that a significant association does indeed exist between a mother's knowledge and her children's behavior in respect to antibiotic usage (Angelina and Tjandra, 2019). Martapura District is the most densely populated in Banjar Regency with a population density of 3,004/km2 (BPS Kabupaten Banjar, 2024). Densely populated communities with varying levels of education, knowledge, and other factors often consume certain drugs without the correct dosage, and are unaware of the contra-indications and side effects of drugs (Khairiyati, 2015). Hence, the present study was undertaken to elucidate the understanding and practices of individuals residing in Martapura District pertaining to antibiotic usage, as well as to ascertain the potential association between knowledge and behavior regarding antibiotic utilization among the population of Martapura District. The study hypothesis consists of a null hypothesis, namely that there is no relationship between knowledge and antibiotic use behavior in the people of Martapura district. While the first hypothesis is that there is a relationship between knowledge and antibiotic use behavior in the people of Martapura district.

METHOD

This is an analytical observational with a cross-sectional approach that was conducted in the Martapura District area. This study has approved by The Health Research Ethics Committee of Faculty of Medicine Lambung Mangkurat University (451/KEPK-FK UNLAM/EC/XI/2020). The people that reside in the Martapura District region make up the population of this study. People from the Martapura District who had previously used antibiotics and met the inclusion and exclusion criteria made up the research sample.

The following are the study's inclusion criteria:

1. Registered as a Martapura DIstrict resident, as demonstrated by KTP
2. Be at least 17 years old
3. Being open to participating in research

The following are the study's exclusion criteria:

1. The respondent is ill (communication is challenging).
2. The respondents did not fully finish the questionnaire

With a confidence level of 95% and a sampling error of 10%, the Isaac and Michael formula was used to compute the sample size for the study, yielding a minimum sample size of 97 respondent. Quota sampling was utilized during the sampling process.

A questionnaire served as the research's main tool. The survey was adapted from studies by Larasari (Larasari, 2015) and Scaioli et al. (Scaioli et al., 2015). The questionnaire is divided into 4 sections, including:

1. Part I is informed consent, which serves as legal authorization to engage in research.
2. Part II is personal information about the responder, including gender, age, highest educational level, and occupation.
3. Part III has 14-point statements about understanding antibiotics. Point "1" is awarded for a

correct response, and point "0" for an incorrect response.

4. Part IV has 10-point statements about how people utilize antibiotics. Positive statements will be graded with a yes or no response, with a score of "1" for affirmative responses and "0" for negative responses. Positive statements receive a score of "0" for a yes response, while negative statements receive a score of "1" for a no response.

The validity of the survey utilized in this study was initially examined using Pearson correlation on 20 individuals who were not included as respondents. The statement items are deemed valid if all of them have a p value of less than 0.05. Using the Cronbach Alpha method, the questionnaire underwent reliability testing. If the alpha value is more than 0.60, a claim is deemed reliable.

Meeting respondents at their homes served as the method for collecting data at this level. The responder was given information about the study and a form asking for informed consent was used to gauge their desire to participate. The next step involved asking respondents to complete a questionnaire on their personal information, understanding about antibiotics, and usage patterns. To reduce bias in this study, we limited antibiotic use to a maximum of 6 months before data collection. In this study, there was no missing data, because the questionnaire was filled out at one time and when the respondents filled it out, they were accompanied by the researcher. The characteristics of the respondents were described using univariate analysis, and the relationship between knowledge and behavior in the use of antibiotics was examined using bivariate analysis and the Spearman rank correlation test.

RESULT AND DISCUSSION

A total of 110 people from the Martapura District participated in this research. All data can be analyzed and there is no missing or incomplete data in this study. This is because, when data collection was carried out, respondents filled out the questionnaire accompanied by the researcher. Table 1 shows the characteristics of the participants.

Table 1. The characteristics of the participants

Characteristics		**Frequency (N = 110)**	**Percentage (%)**
Gender	Male	37	33.64
	Female	73	66.36
Age (years)	17 – 27	32	29.09
	28 – 37	26	23.64
	38 – 47	34	30.91
	> 47	18	16.36
Education level	None educated	1	0.91
	Primary	9	8.18
	Intermediate	30	27.27
	Secondary	52	47.27
	University	18	16.36
Occupation	Teacher	10	9.09
	Private employee	28	25.45
	Housewife	41	37.27
	Unemployed	12	10.91
	Labor	14	12.73
	Civil servant	5	4.55
	Total	**110**	**100**

Source: Primary data, 2020

Examining the characteristics of respondents based on gender reveals that many respondents (66.36%) are female. According to Kurniawati, there exists a higher level of concern among women over their health (Kurniawati, 2019). According to Kurniawan et al., women within a familial context assume the responsibility of providing care for all members of the family and play a pivotal role in making decisions pertaining to their health (Kurniawan,

Posangi and Rampengan, 2017). The age range of most study participants (30.91%) fell between 38 and 47 years old. The preceding age range is situated inside the late adulthood stage, suggesting a significant amount of expertise in the realm of treatment. The repeated utilization of antibiotics can occur due to an understanding of the advantageous therapeutic effects associated with their administration.

Based on level of education, 47.27% of the respondents who took part in the study had a high school. The easier it is for someone to absorb information, the more education they have (Kurniawati, 2019) (Situmorang and Yosi, 2013). However, if we break it down by occupation, most respondents (37.27%) are housewives. According to most respondents who took part in the research, which were women, the respondent's primary occupation is housewifery. After getting married, women typically decide to prioritize taking care of their families, according to social norms (Kurniawati, 2019).

Knowledge and Behavior of Antibiotic Use

In this study, knowledge of antibiotics was evaluated using a questionnaire. The knowledge questionnaire measures 5 indicators: knowledge of antibiotic indications, examples of antibiotics, side effects of antibiotics, antibiotic resistance, and antibiotic use. Each respondent's total score is divided into three categories for the assessment of knowledge criteria: low knowledge (score 0-4), medium knowledge (scoring 5-9), and high knowledge (score 10–14). The 110 respondents' average knowledge score was 7.11 ± 1.69, indicating that respondents have medium knowledge. Figure 1 depicts a summary of the respondents' knowledge about antibiotics

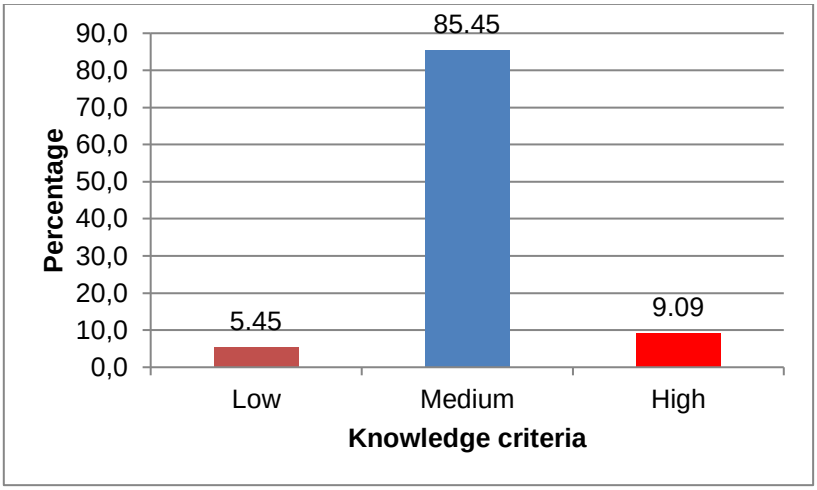

Figure 1. Knowledge criteria of respondents

Most of the respondents have a degree of knowledge in the medium category (85.45%). Some factors that may affect a person's level of knowledge are education, occupation, experience, beliefs and social culture (Notoatmodjo, 2014). Many respondents in this study had a middle to upper education level which may correlate with the level of knowledge possessed. The high level of knowledge of respondents about antibiotics also depends on the information they get from sources of information, or non-formal education (Budiman and Riyanto, 2013). Since there is currently a lack of information among the public, mistakes can be made when administering antibiotics, increasing the likelihood that antibiotic misuse will have unfavorable effects. Table 2 provides information on the respondents' degree of understanding for each question.

Table 2. Respondents' knowledge on each indicator

Indicator	Statement	Percentage (%)	
		Right	Wrong
Definition	Antibiotics are medications that can both prevent and treat bacterial diseases.	97.27	2.73
Indication	Antibiotics can treat non-bloody diarrhea and cold	28.18	71.82
	Antibiotics are effective against bacterial infections, such as tuberculosis	71.82	28.18
	Antibiotics can be used to reduce all types of pain and inflammation (swelling)	15.45	84.55
	Antibiotics can be used to lower fever	30.91	69.09
Type of antibiotic/example	Ampicillin or amoxicillin is an antibiotic	88.18	11.82
	Aspirin is an antibiotic	60.91	39.09
	Paracetamol is an antibiotic	51.82	48.18
Antibiotic resistance	The capacity of an antibiotic to kill germs is lost due to resistance	73.64	26.36
	Antibiotics may take longer to work because of resistance	69.09	30.91
	Antibiotic resistance can be prevented by reducing or lowering antibiotic doses	25.45	74.55
Side effects	Antibiotics are medications that are risk-free and have no adverse effects	28.18	71.82
	Antibiotics can cause allergic reactions	51.82	48.18
Antibiotic use	If the illness has been cured, antibiotics can be withdrawn	18.18	81.82

The outcomes of the respondents' answers, as presented in Table 2, indicate that there were inaccuracies in the respondents' understanding of indicators pertaining to indications, resistance, side effects, and use of antibiotics. A significant number of participants provided inaccurate responses to the statement regarding the potential prevention of antibiotic resistance through the reduction or decrease of antibiotic dosages. Antimicrobial resistance is a phenomenon that renders antibiotics ineffective in achieving their intended therapeutic outcomes. The phenomenon of antibiotic resistance might arise as a result of the illogical, excessively frequent, and excessive utilization of antibiotics (CDC., 2019). The method to prevent antibiotic resistance, according to the CDC, is to use antibiotics according to doctor's orders and based on culture results, and to take antibiotics until they run out (CDC., 2019).

Antibiotics can be used to alleviate all forms of pain and inflammation (swelling), as only 15.45% of respondents correctly stated. This finding illustrates that a significant portion of the population lacks knowledge and understanding regarding the applications of antibiotics. The implementation of this technology may lead to errors, perhaps impacting the level of resistance (Kurniawati, 2019). As many as 81.82 percent of respondents provided the incorrect response to the statement "Antibiotics can be discontinued if the disease has been cured." This demonstrates that the public is still unaware that the use of antibiotics is distinct from the use of other medications, which can be discontinued once the ailment has been treated. Even following the alleviation of symptoms, it is still necessary to continue the administration of antibiotics. According to Pulungan's study, a mere 34.3% of participants indicated awareness and understanding of the importance of completing a full course of antibiotics, even after symptoms have faded (Pulungan, 2017).

The acquisition of knowledge can be influenced by a multitude of elements, such as one's degree of education, exposure to information through mass media, the influence of social and cultural norms, economic conditions, environmental circumstances, and personal experiences. However, age and gender do not serve as the primary factors influencing

knowledge acquisition. Based on Hermawati's study, it has been established that there is no discernible impact of gender on an individual's knowledge level (Hermawati, 2012). Similarly, Larasari's research findings reveal that age does not exert any influence on the degree of knowledge (Larasari, 2015).

In this study, antibiotic usage behavior was also assessed using a questionnaire and classified into positive and negative conduct. If the outcome lies within the range of 0 to 5, the behavior is classified as negative. Conversely, if the outcome falls within the range of 6 to 10, it is categorized as positive. The assessment of antibiotic utilization within the Martapura District community yielded a mean score of 6.55 ± 2.45, indicating a favourable level of adherence to recommended practices. Figure 2 presents an overview of the patterns of antibiotic utilization within the population of Martapura District.

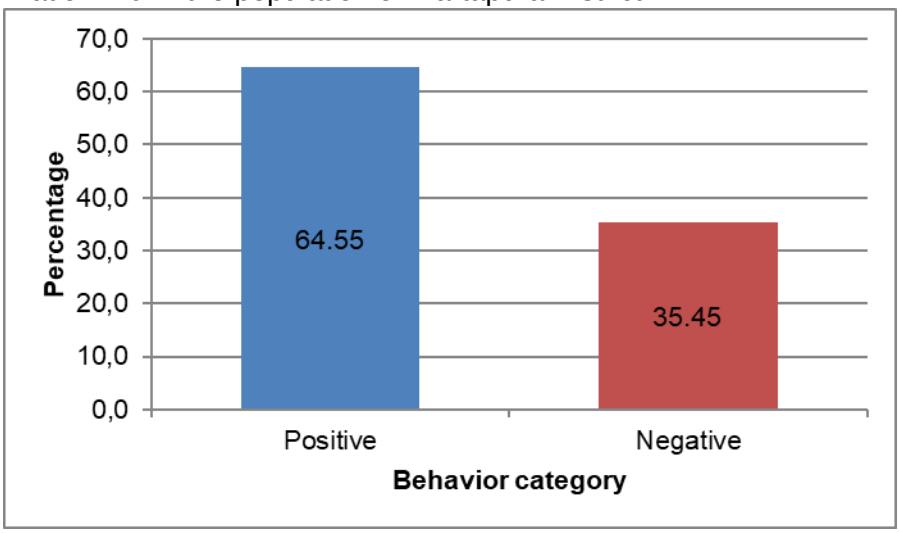

Figure 2. Description of antibiotic use behavior

According to research findings like Figure 2, 64.55% of the people in the Martapura District area in using antibiotics have positive behavior. Table 3 provides a summary of respondent behavior based on each statement point.

Table 3. Description of respondent behavior for each statement

Statement	Percentage (%)	
	Yes	No
I used antibiotics to treat the fever	60.91	39.09
When I feel better, I usually stop taking antibiotics	79.09	20.91
I only take antibiotics as directed by a doctor	59.09	40.91
Typically, I offer my family members who are ill the medication I take	71.82	28.18
I always have antibiotics on hand at home	62.73	37.27
I would use the same antibiotic once more if I had the same condition	70	30
The remaining antibiotics I stored at home in case I needed them later	58.18	41.82
When I have a cold, sore throat, or the flu, I typically treat	54.54	45.45

myself with leftover antibiotics from home without contacting a doctor		
I bought antibiotics without a doctor's prescription	51.82	48.18
Before using antibiotics, I typically check the expiration date	86.36	13.64

Some of the positive behaviors of the public regarding the use of antibiotics are looking at the expiration date before using antibiotics, using antibiotics only when prescribed by a doctor, not using antibiotics left at home to treat colds, sore throats and flu without consulting a doctor. Meanwhile, people's negative behavior regarding the use of antibiotics is stopping antibiotics when they feel better, using antibiotics to treat fever and giving antibiotics to family members who are sick. Appropriate antibiotic use behavior is very necessary to maximize the therapeutic effect of antibiotics and minimize the negative impacts of antibiotics.

Relationship Between Knowledge And Antibiotic Use Behavior

Table 4 displays the findings of the Spearman rank correlation test between knowledge and behavior related to antibiotic use with a 95% confidence level.

Table 4. Spearman Rank Test Results

Variable	Mean ± SD	Correlation coefficient	p-value
Knowledge	7.11 ± 1.69	-0.098	0.307
Behavior	6.55 ± 2.45		

A p-value of 0.307 ($p > 0.05$) indicates that there is no significant link between knowledge and antibiotic usage behavior among the residents of Martapura District, according to the correlation test results shown in Table 4. The obtained correlation coefficient value was 0.098, and the direction of the correlation was negative (-), indicating a very weak correlation with the direction of the opposite correlation. The findings differ from earlier research by Kurniawati, which found a correlation between knowledge and antibiotic usage behavior among customers in pharmacies in the Glagah subdistrict (Kurniawati, 2019). Apart from information, a person's behavior in using antibiotics can be influenced by a variety of factors, including socio economic factors, attitudes, beliefs, references to other people, and access to health services. It is impossible to avoid recollection bias, which may have affected the study's findings. We have tried to reduce bias by limiting the use of antibiotics to six months at a time.

CONCLUSION

The results of this study suggest that there is no association between knowledge and antibiotic use habits among residents of Martapura District. It is necessary to provide education to the community in Martapura District to increase knowledge about antibiotic use also appropriate and careful antibiotic use behavior.

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