

The Relationship between Knowledge and Community Attitude Towards Antibiotic Use at Megang Urban Village of Lubuklinggau City

Hubungan Tingkat Pengetahuan dan Sikap Masyarakat Tentang Penggunaan Antibiotik di Kelurahan Megang Kota Lubuklinggau

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Abstract

Introduction: The irrational use of antibiotics has become a global concern due to its potential to trigger antimicrobial resistance (AMR). Various factors contribute to inappropriate antibiotic use, among which limited public knowledge about antibiotics plays a significant role. Understanding the relationship between knowledge and attitudes toward antibiotic use is essential for designing effective educational interventions, particularly in communities with limited access to health information. **Objective:** This study aimed to assess the level of knowledge and attitudes regarding antibiotic use and to analyze the relationship between these two variables among the community in Megang urban village, Lubuklinggau City, Indonesia. **Methods:** A cross-sectional study was conducted from June to July 2023 involving 300 respondents selected through proportionate stratified random sampling. Data were collected using a validated questionnaire comprising three sections: sociodemographic characteristics (6 items), knowledge (12 items), and attitudes (8 items). Knowledge and attitude scores were categorized based on median values. The relationship between knowledge and attitude was analyzed using the Spearman Rho correlation test. **Results:** The majority of respondents (63.3%) demonstrated good knowledge regarding antibiotic use, while 50.3% exhibited positive attitudes. Bivariate analysis revealed a significant positive correlation between knowledge and attitude scores ($r = 0.481$; $p < 0.001$), indicating a moderate strength of association. This finding suggests that better knowledge is associated with more positive attitudes toward appropriate antibiotic use. **Conclusion:** A significant positive relationship exists between the level of knowledge and attitudes toward antibiotic use in the study population. These findings underscore the importance of implementing structured educational interventions, particularly at primary healthcare facilities, to enhance both knowledge and attitudinal aspects of antibiotic use, thereby contributing to the prevention of antimicrobial resistance.

Keywords: Antibiotics, Knowledge, Attitude, Antimicrobial Resistance, Community Health.

Abstrak

Pendahuluan: Penggunaan antibiotik yang tidak rasional menjadi perhatian global karena berpotensi memicu resistensi antimikroba. Berbagai faktor berkontribusi terhadap penggunaan antibiotik yang tidak tepat, di mana pengetahuan masyarakat yang terbatas tentang antibiotik memegang peranan penting. Memahami hubungan antara pengetahuan dan sikap terhadap penggunaan antibiotik sangat penting untuk merancang intervensi edukasi yang efektif, terutama pada komunitas dengan akses terbatas terhadap informasi kesehatan. **Tujuan:** Penelitian ini bertujuan untuk menilai tingkat pengetahuan dan sikap mengenai penggunaan antibiotik serta menganalisis hubungan antara kedua variabel tersebut pada masyarakat di Kelurahan Megang, Kota Lubuklinggau, Indonesia. **Metode:** Studi potong lintang ini dilaksanakan pada bulan Juni hingga Juli 2023 dengan melibatkan 300 responden yang dipilih melalui proportionate stratified random sampling. Pengumpulan data menggunakan kuesioner tervalidasi yang terdiri dari tiga bagian: karakteristik sosiodemografi (6 item), pengetahuan (12 item), dan sikap (8 item). Skor pengetahuan dan sikap dikategorikan berdasarkan nilai median. Hubungan antara pengetahuan dan sikap dianalisis menggunakan uji korelasi Spearman Rho. **Hasil:** Sebagian besar responden (63,3%) menunjukkan pengetahuan yang baik tentang penggunaan antibiotik, sementara 50,3% menunjukkan sikap positif. Analisis bivariat menunjukkan korelasi positif yang signifikan antara skor pengetahuan dan sikap ($r = 0,481$; $p < 0,001$), yang mengindikasikan kekuatan hubungan yang moderat. Temuan ini menunjukkan bahwa pengetahuan yang lebih baik berhubungan dengan sikap yang lebih positif terhadap penggunaan antibiotik yang tepat. **Kesimpulan:** Terdapat hubungan positif yang signifikan antara tingkat pengetahuan dan sikap terhadap penggunaan antibiotik pada populasi penelitian. Temuan ini menggarisbawahi pentingnya implementasi intervensi edukasi terstruktur, terutama di fasilitas kesehatan primer, untuk meningkatkan aspek pengetahuan dan sikap dalam penggunaan antibiotik, sehingga berkontribusi pada pencegahan resistensi antimikroba.

Kata Kunci: Antibiotik, Pengetahuan, Sikap, Resistensi Antimikroba, Kesehatan Masyarakat.



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Introduction

Infectious diseases remain one of the major public health problems, particularly in developing countries. Antibiotics are medications used to treat bacterial infections. However, the inappropriate use of antibiotics can lead to the emergence of antibiotic resistance [1]. According to the World Health Organization (WHO), antibiotic resistance occurs when bacteria become resistant to antibiotics that were previously effective in treating bacterial infections [2].

Inappropriate antibiotic use is closely associated with inadequate knowledge and awareness regarding antibiotics and their proper use. A study conducted by Kodoj, et al (2020) in Manado reported that 69% of respondents had relatively low levels of knowledge regarding antibiotic use [3]. Similarly, a study by Pratomo and Dewi (2018) in a region of Central Kalimantan found that 34.5% of the population had poor knowledge about antibiotics [4]. A study stated that almost more than 50% of research on subjects in DKI Jakarta believed that antibiotics could be used to treat viral infections [5]. Hamid et al. (2020), in a study conducted in a district of South Sulawesi, it was found that many respondents still do not fully understand the uses/indications of the antibiotics they use, so that this lack of knowledge causes most respondents to still practice purchasing antibiotics even without a doctor's prescription [6]. Furthermore, a study in Banjarbaru revealed that the level of public knowledge regarding antibiotic use was still inadequate, with 55.9% of respondents demonstrating poor knowledge [7]. Likewise, Handayanti and Gunawan (2021) found that the majority of residents in Tambelang District, Bekasi Regency, had insufficient knowledge regarding antibiotic use (52.4%) [8].

A literature review of previous research in Indonesia found a lack of knowledge and the negative attitudes toward antibiotic use [9]. One example of a research showed that over 50% of students in Garut have negative attitudes toward antibiotic use [10]. However, some researches stated good knowledge built a quite bit of attitude of antibiotic use [11] [12]. Therefore, adequate public awareness and knowledge regarding antibiotics can help individuals develop positive attitudes and appropriate practices toward antibiotic use.

Information regarding the levels of public knowledge and attitudes toward antibiotic use, as well as the factors influencing them, remains limited in Indonesia. In particular, no similar study has been conducted in Lubuklinggau City. Therefore, this study aimed to assess the levels of knowledge and attitudes regarding antibiotic use among residents of Megang urban village, Lubuklinggau City.

Method

This study employed a non-experimental design using a cross-sectional approach. The study was conducted in Megang urban village, Lubuklinggau City, Indonesia, from June to July 2023. Ethical approval for this study was obtained from the Medical and Health Research Ethics Committee of Universitas Muhammadiyah Prof. DR. HAMKA (KEPKK-UHAMKA) under approval number 03/22.04/01694, dated June 19, 2023.

The study population consisted of all residents of Megang urban village, Lubuklinggau city. The inclusion criteria were individuals aged 18–65 years, those who agreed to participate by providing written informed consent, and those who had previously used antibiotics. Individuals with communication difficulties and those who did not complete the questionnaire were excluded from the study. The minimum sample size was calculated using Slovin's formula based on a population of 880 individuals aged 18–65 years and a margin of error of 5%, resulting in a minimum required sample size of 275 participants. Since Megang

urban village comprises seven neighborhood units (Rukun Tetangga, RT), participants were selected using proportionate stratified random sampling.

A questionnaire was developed and validated, which consisted of a total of 28 questions with three section: sociodemographics (6), knowledge (12) and attitude (8). The questionnaire to measure knowledge consisted of 12 items covering the definition, indications, types of antibiotics, adverse effects, antibiotic resistance, methods and sources of obtaining antibiotics, and the disposal of expired antibiotics. Each item had two response options ("Yes" and "No"). Correct answers were assigned a score of 1, whereas incorrect answers received a score of 0. Therefore, the total knowledge score ranged from 0 to 12. The distribution of total knowledge scores was assessed using the Kolmogorov–Smirnov test and was found to be non-normally distributed, with a median score of 6. Consequently, the median value was used as the cut-off point, with scores ≥ 6 categorized as good knowledge and scores < 6 categorized as poor knowledge [13].

The questionnaire about attitude consisted of eight statements measured using a five-point Likert scale ranging from strongly disagree, disagree, uncertain, agree, to strongly agree. The total attitude score ranged from 8 to 40, with higher scores indicating more positive attitudes toward antibiotic use.

The distribution of total attitude scores was examined using the Kolmogorov–Smirnov test and was found to be non-normally distributed, with a median score of 28. Therefore, the median value was used as the cut-off point for categorizing attitudes, with scores ≥ 28 indicating positive attitudes and scores < 28 indicating negative attitudes(13). Content validity assessment for both the knowledge and attitude questionnaires involved six experts, comprising three pharmacy lecturers, two community pharmacists, and one physician. The Content Validity Index (CVI) for each item was 1.00 and s-CVI/ave was 1 for both knowledge and attitude questionnaires. Construct validity testing involving 30 respondents was conducted using the Pearson Correlation test. The results showed that all questionnaire items had Pearson Correlation coefficient greater than the critical value (r table = 0,361, n = 30, p <0,05) indicating that both questionnaires were valid. The Pearson correlation coefficients ranged from 0.718 to 0.793 for the knowledge questionnaire and from 0.598 to 0.898 for the attitude questionnaire. Reliability testing showed Cronbach's alpha coefficients of 0.927 for the knowledge questionnaire and 0.868 for the attitude questionnaire.

Univariate analysis was performed to describe the frequency distribution of respondents' demographic characteristics, knowledge levels, and attitudes. Spearman's rank correlation test was used to assess the relationship between knowledge scores and attitude scores toward antibiotic use. This test was chosen because the knowledge and attitude scores were not normally distributed. A p -value of less than 0.05 was considered statistically significant.

Results and Discussion

A total of 300 residents of Megang urban village participated in this study. The majority of respondents were aged 18–40 years (59.7%). Female respondents outnumbered males, accounting for 59.7% of the study population. Most respondents had not attained higher education, with 88.0% reporting an educational level below university. This was due to the prevailing culture in Megang urban village, whereby upon graduating from elementary, middle, and high school, many choosed to immediately enter the workforce and got married. More than two-thirds of the respondents were employed (69.7%). Only 4.0% of respondents worked in the healthcare sector, and the majority reported having no family members employed as healthcare professionals (81.7%).

Regarding antibiotic use, 66.3% of respondents reported that they had last used antibiotics more than one month prior to the study period. The most frequently visited healthcare facility for obtaining healthcare services was the community health center (*Puskesmas*), which was reported by 42.3% of respondents (Table 1).

The results of this study showed that the majority of respondents had a good level of knowledge regarding antibiotic use (63.3%) (Table 2). This finding is consistent with the study conducted in Cempaka (Banjar Baru), which reported that most respondents demonstrated good knowledge levels (78.3%) [7]. A high proposition of respondents correctly understood that antibiotics are intended for the treatment of bacterial infection (84,3%) and identified amoxicillin as an antibiotic (84,7%). However, they demonstrated poor knowledge regarding the fact that antibiotics cannot be used to treat viral infections (78%) and common cold (68.3%). People in some areas still didn't understand that the common cold is almost exclusively caused by viruses and therefore doesn't require antibiotics for treatment (Table 3). However, only 22% and 31.7% of

respondents knew that antibiotics cannot be used to treat viral infections and flu. People in some areas still didn't understand that flu is caused by viruses and therefore doesn't require antibiotics for treatment[14].

Table 1. Respondent's Characteristics

Characteristic	Frequency (n)	Percentage (%)
Age (years old)		
18-40	179	59.7
41-60	121	40.3
Age Range (years old)	18-60	
Gender		
Female	179	59.7
Male	121	40.3
Last Education		
College	36	12.0
Non-college	264	88.0
Employment status		
Employed	209	69.7
Unemployed	91	30.3
Scope of Occupation		
Healthcare	12	4.0
Non-healthcare	288	96.0
Having a family member as a Healthcare		
Yes	55	18.3
No	248	81.7
Last time took antibiotics		
Less than a month ago	101	33.7
More than a month ago	199	66.3
Health care facilities that often visited		
Hospital	83	27.7
Pharmacy	53	17.7
Community health center	127	42.3
Clinic	37	12.3

Table 2. Knowledge Categories of Respondents

Categories	Frequency (n=300)	Percentage (%)
Good	190	63.3
Not good	110	36.7

Table 3. Distribution of Respondent's Answer on Knowledge of Antibiotic Use

No.	Statement	Correct (%)	Incorrect (%)
1	Antibiotics are used to treat bacterial infections.	84.3	15.7
2	Antibiotics can be used to treat viral infections.	22.0	78.0
3	Antibiotics should always be prescribed for patients with coughs and colds.	31.7	68.3
4	Paracetamol is an antibiotic.	35.3	64.7
5	Amoxicillin is an antibiotic.	84.7	15.3
6	Antibiotics may cause allergic reactions.	56.7	43.3
7	Antibiotics do not have any side effects.	39.0	61.0
8	Failure to complete a prescribed course of antibiotics can contribute to bacterial resistance.	62.3	37.7
9	It is acceptable to stop taking antibiotics once symptoms improve, even if the prescribed course has not been completed.	32.7	67.3
10	Antibiotics can be purchased without a doctor's prescription.	47.0	53.0
11	Antibiotics can be purchased from drug stores or local convenience shops without a prescription.	39.3	60.7
12	All expired antibiotics can be disposed of directly in the household trash bin.	19.7	80.3

Most respondents lacked knowledge regarding the appropriate disposal of antibiotics in households (80.3%) (Table 3). Appropriate disposal of expired antibiotics includes either rendering them unrecognizable by crushing and mixing them with undesirable materials such as soil, prior to disposal in household waste or returning them to an authorized medicine take back program. Approximately 67.3% of respondents were

unaware that antibiotics should not be stopped once the illness has healed, even if the antibiotics haven't run out. Antibiotics must be used until the end of the course to ensure that the bacteria causing the illness are completely killed. This could be the basis for public education regarding antibiotic knowledge in the future.

Age characteristics correlated with respondents' knowledge levels (Table 4). The odds ratio for age data was 0.615, meaning that those aged 18-40 years were 0.6 times more knowledgeable than those aged 41-65 years. The results of the data analysis showed a significant relationship between last education and knowledge (Table 4). The Odds Ratio data for respondents' highest level of education was 2.855, which means that respondents with a higher education were 2.8 times more likely to have good knowledge compared to those without higher education. The analysis result also showed that there was a relationship between employment status and knowledge level ($p < 0.05$), with an odds ratio of 2.049. This means that respondents who worked were 2.0 times more knowledgeable than those who did not work.

Table 4. Association between Characteristics' Respondent and Antibiotic Knowledge Level

Characteristic	Knowledge Level		p-Value	Odds Ratio (OR)	Confidence Interval (CI)
	Poor n (%)	Good n (%)			
Age (years)			0.040*	0.615	0.386–0.979
18–40	76 (42)	103 (57)			
41–65	66 (54)	55 (45)			
Gender			0.265	0.769	0.484–1.221
Female	80 (44)	99 (55)			
Male	62 (51)	59 (48)			
Last Education			0.005*	2.855	1.349–6.042
College	25 (69)	11 (30)			
Non-College	117 (44)	147 (55)			
Employment Status			0.005*	2.049	1.232–3.407
Employed	110 (53)	99 (47)			
Unemployed	32 (35)	59 (65)			
Occupation			<0.001*	–	–
Healthcare professional	12 (100)	0 (0)			
Non-healthcare professional	130 (45)	158 (55)			

$p < 0.05$ was considered statistically significant by Chi Square Analysis.
OR = Odds Ratio; CI = Confidence Interval (95%)

A total of 50.3% of respondents had a positive attitude toward antibiotic use (Table 5). This indicates that the majority of people in Megang urban village had a fairly positive attitude toward antibiotic use. A similar study in Boyolali City (Central Java) also showed moderately positive attitudes toward antibiotic use [15].

Table 5. Respondents Attitude of Antibiotic Use

Attitude	Frequency (n=300)	Percentage (%)
Negative	149	49,7
Positive	151	50,3

Table 6. Correlation Between Knowledge and Attitude Score on The Use of Antibiotic

Variable	Median (Min-Max)	p-Value	Coefficient correlation
Knowledge	6 (0-12)	0.001*	0.481
Attitude	28 (8-40)		

(* $p = 0.001$ correlated significant based on Spearman rho analysis).

The result showed a significant relationship between knowledge and attitudes towards antibiotic use in the community in the Megang urban village of Lubuklinggau City ($p < 0.05$) with an r value of 0.481. It had a positive relationship with a moderate correlation strength. It showed that with good knowledge, community attitudes will also show a better attitude regarding the appropriate use of antibiotics. Research in one region in Malaysia also stated that knowledge and attitudes towards antibiotics are correlated [16]. In Indonesia, similar results were also found in 96 research subjects in Sibuntuon Village, Uluan Toba District, showed a positive correlation between knowledge and attitudes towards antibiotic use [17]. Therefore, it can be

described that to provide a positive value or attitude in this case is the rational use of antibiotics must begin with adequate knowledge regarding any information from antibiotics, which is primarily targeting communities whose lives are still far from access to health information.

Research Limitations

This study has several limitations. First, the cross-sectional design is only able to capture relationships at a single point in time, so it cannot determine causality. Second, the generalizability of the results is limited because the sample was only taken from one place in Lubuklinggau City. Further research with a cohort design and wider coverage area is highly recommended.

Conclusions

The findings of this study indicate that the majority of respondents had a good level of knowledge regarding antibiotics (63.3%), while approximately half of the respondents demonstrated positive attitudes toward antibiotic use (50.3%). Furthermore, a significant association was observed between the level of knowledge and attitudes toward antibiotic use ($p < 0.001$). These findings emphasize the need for more intensive and structured educational interventions on the rational use of antibiotics, especially in primary health care facilities (Puskesmas), which are most frequently visited by the public. Education should not only focus on increasing knowledge but also on affective and behavioral aspects to change persistently negative attitudes. Further research using a qualitative approach is recommended to explore the root causes of negative public attitudes toward antibiotic use.

Conflict of Interest

We declare that there is no conflict of interest to authors or anyone whom concern of its.

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