# Knowledge and attitude: two fundamental factorsthat determine patient compliance in antibiotictherapy

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# Knowledge and attitude: two fundamental factors that determine patient compliance in antibiotic therapy

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**Abstract:**
With the development of infectious diseases, the use of antibiotics is increasing. Amoxicillin is a penicillin class of antibiotics that are widely used today. Compliance with amoxicillin can reduce the risk of microbial resistance. Two fundamental factors that determine patient compliance in antibiotic therapy are the patient's knowledge and attitude towards the antibiotic. In this study, we intend to know the effect of knowledge and attitudes of patients on their compliance in using amoxicillin antibiotics. This study was an observational study with a cross section approach, a purposive sampling method by giving questionnaires to 100 respondents who received amoxicillin in Arjuno Primary Health Care, Klojen district in April 2019. Research variables included knowledge, attitudes, and patient compliance in using amoxicillin antibiotics. Data analysis was performed to determine the effect of knowledge and attitudes of patients on compliance with amoxicillin antibiotic therapy. The results showed that knowledge significantly influences the compliance (sig = 0.00), while attitude does not significantly influence compliance while using amoxicillin antibiotics (sig = 0.136). Knowledge and attitude were known to have a significant effect on compliance with amoxicillin antibiotic therapy (sig = 0.00), the magnitude of the influence of the two variables ($R^2$ = 16.7%). It can be concluded that the patients' knowledge and attitude influences their compliance to antibiotic therapy.
**Keywords:** amoxicillin, attitude, compliance, knowledge

## Introduction

Infectious diseases are a problem faced by many developing countries, including Indonesia; it is still the major cause of morbidity and infant mortality [1]. Treatment of infectious diseases commonly used antibiotics. Irrational use of antibiotics can cause resistance and high medical costs. In Sweden, for example, a random household survey found that 26.8% of participants believed that antibiotics were effective against viruses and that 84.7% endorsed the mistaken idea that humans become resistant to antibiotics [2]. A comparative study of antibiotic knowledge in 11 European countries found variation in knowledge, most particularly with regard to inaccurate knowledge of antibiotic resistance, which ranged between 29% (Belgium) to 83% (Lithuania) of respondents. From these studies note that the use of inappropriate antibiotic indications and should be reviewed is still high [3]. Factors that cause resistance to antibiotic use include overuse, unnecessary administration or irrational use [4]. Rational use of antibiotics if they meet the right indications, the right choice of drugs, the right dosage, how to use the right drug, the right interval of use of the drug, the correct duration of antibiotic use, care about the emergence of side effects, as well as the right information in using antibiotics [5].

Public knowledge about antibiotic resistance is still less. Knowledge is a social cognitive factor that influences health-related behavior in individuals, including the behavior related to antibiotic use. The higher the level of knowledge possessed, the easier it is for the individuals to receive information, while attitudes describe readiness or willingness to act [6]. Based on the results of research conducted by AMRIN-study (antimicrobial resistance in Indonesia), the most widely used antibiotics are ampicillin and amoxicillin. Amoxicillin is an antibiotic that is prescribed for the treatment of bacterial infections of ears, throat, urinary tract, and skin [7]. Amoxicillin is also used by farmers for livestock production, so there is a lack of control over the use of amoxicillin. This is one of the misuses of amoxicillin, which can cause exposure to pathogenic germs which results in resistance [8].

This research was conducted at the Arjuno Primary Health Care Center, Klojen district, Malang city, because the use of amoxicillin in this Center was quite high. This research was conducted to determine the effect of knowledge and the attitude of patients towards their compliance with the use of amoxicillin antibiotics [9].

## Materials and methods

This research wasconducted during April 2019 at the Arjuno Primary Health Care Center, Klojen district, Malang city carried out by cross sectional and observational research methods. The sampling method is done accidentally to patients who meet the inclusion criteria. The analysis was conducted by providing questionnaire to respondents who received amoxicillin antibiotic therapy. The questionnaire was designed to fulfill the validity and checked for reliability before applying it in the research. The total respondents selected for this study was 100. Data analysis was conducted by multiple linear regression statistical tests to determine the influence of knowledge and attitude towards compliance of using amoxicillin antibiotics.

## Results

In this study demographiccharacteristics of patients in this study were observed, the results are shown in Table 1.

**Table 1:** The demographic characteristics of the patients.

| Age | Frequency, people | Percentage, % |
| --- | --- | --- |
| 17–35 years | 45 | 45 |
| 36–55 years | 43 | 43 |
| >55 years | 12 | 12 |
| Gender | | |
| Man | 32 | 32 |
| Woman | 68 | 68 |
| Education | | |
| High school | 58 | 58 |
| Vocational | 2 | 2 |
| Bachelor | 40 | 40 |

AIt was confirmed that the largest age group receiving amoxicillin antibiotic therapy is 36–45 years (24%), 68% of the patients were female and 58% have completed high school education.dd a table footnote here

Further patients were analyzed the knowledge about amoxicillin and was categorized as good, and not good. Patients' attitude towards using amoxicillin is categorized into positive ($\geq$Mean T50) and negative (<Mean T50) values and patients' compliance in using amoxicillin was categorized as being compliant ($\geq$Mean Score T50) and not compliant (<Mean Score T50).

**Table 2:** Categories of knowledge, attitudes and compliance of patients using amoxicillin antibiotics.

| | Percentage, % |
| --- | --- |
| Knowledge | |
| Good | 59 |
| Not good | 41 |
| Attitude | |
| Positive | 45 |
| Negative | 55 |
| Compliance | |
| Compliance | 47 |
| No compliance | 53 |

Table 2 shows the data of categories under which the study was performed. Patients with good knowledge about amoxicillin were 59%, patients with not good knowledge category were 41%. Patients with a positive attitude towards the use of amoxicillin were 45% and negative attitude 55%. Patients under the compliant category were 47% and non-compliant were 53%.a table footnote here

To find out the effect of each of the knowledge and attitude variables on compliance in using amoxicillin, paired T tests were used. The results can be seen in Table 3.

**Table 3:** Effect of each of the knowledge and attitude variables on compliance in using amoxicillin antibiotics in Arjuno Primary Health Care Center, Klojen District, Malang city.

| Model | Unstandardized coefficients | | Standardized coefficients | t | Significance |
|---|---|---|---|---|---|
| | B | Std. error | Beta | | |
| Constant | 13.018 | 2.004 | | 6.495 | 0.000 |
| Knowledge | 0.615 | 0.202 | 0.315 | 3.041 | 0.003 |
| Attitude | 0.132 | 0.089 | 0.155 | 1.493 | 0.139 |

It is shown that knowledge has a value of $\alpha$ 0.003 < 0.05, which shows a significant effect of knowledge on patient compliance in using amoxicillin, while attitude has a value of $\alpha$ 0.139 which shows no significant effect.

Furthermore, to determine the effect of the two variables (knowledge and attitude) on compliance in using amoxicillin, the Anova test was used. The results can be seen in Table 4.

**Table 4:** Effect of knowledge and attitude variables on patient compliance in using amoxicillin antibiotics in Arjuno Primary Health Care Center, Klojen Distric, Malang City.

| Model | Sum of squares | df | Mean square | F | Significance |
|---|---|---|---|---|---|
| Regression | 149.446 | 2 | 74.00723 | 9.706 | 0.000[a] |
| Residual | 746.794 | 97 | 7.0699 | | |
| Total | 896.240 | 99 | | | |

To determine the strength of the influence of knowledge and attitudes towards compliance in using amoxicillin antibiotics in Arjuno Health Care Center, Klojen District, Malang City, Multiple correlation analysis is used. The results can be seen in Table 5.

**Table 5:** The influence of knowledge and attitude variables on patient compliance in using amoxicillin antibiotics.

| Model | R | R square | Adjusted R square | Std. error of the estimate |
|---|---|---|---|---|
| 1 | 0.408[a] | 0.167 | 0.150 | 2.775 |

From Table 5 it is known that the correlation value is 0.408, these results indicate that there is an influence with a moderate category between knowledge and attitudes of patients towards their comliance in using amoxicillin. The magnitude of the effect of knowledge and attitudes on comliance in using amoxicillin, is known from the R2 value of 0.167 equivalent to 16.7%, while 83.3% is influenced by other factors not observed in this study.

## Discussion

Based on the demographic characteristics data in Table 1 it can be seen that the majority of patients are women, because women have more time to seek treatment in the morning at the Primary Health Care Center. While the majority of respondents aged 36–45 years were 24%, this result is in line with Rahmayanti's research, 2017 on the characteristics of respondents in the use of health insurance in the BPJS era in Cisoka Primary Health Care Center, Tangerang City from January to August 2015, The research states that people of the age group 26–45 years are the most who came to the Cisoka Primary Health Care Center to get health services.The age group (17- 55 years) is a productive age group that has the potential to get the risk of disease from work and endurance[10][12]. According to the data from the Central Statistics Agency in Malang in 2018, majority of the people in Malang have high school education (33.45%) [9].

Table 2 shows the patient's knowledge about amoxicillin and their use in the category, which is good, while the patient's attitude towards the antibiotic is more in the negative category. This is in line with a comparative study of antibiotic knowledge in 11 European countries finding variations in knowledge, mainly related to inaccurate knowledge about antibiotic resistance, which ranged from 29% (Belgium) to 83% (Lithuania) respondents [3]. In a study in Jordan, despite high usage rates (41%), the majority (39–54%) of 1009 survey respondents

believed in common misconceptions about antibiotic use and the majority (70%) don't know the term "antimicrobial resistance." [11].

In this study, it was found that the patient's knowledge of amoxicillin antibiotic had a significant effect on compliance while the patient's attitude towards amoxicillin had no significant effect that is the patient's attitude did not significantly influence his or her actions to comply with amoxicin antibiotics. This could occur because people considered amoxicillincan be used to treat symptoms of the disease [13]. A study conducted in Alkharj, Saudi Arabia found that 64.3% of participants realized that antibiotics could be used to treat bacterial infections. In contrast, 46.8% of respondents think that antibiotics can be used to treat viral infections. Many people cannot distinguish between bacteria and viruses. As a result, they think that antibiotics can be used to treat both viral and bacterial infections.

It was found that the patient's knowledge about antibiotics had a significant effect on patient compliance while the patient's attitude had no significant effect. Attitude is a readiness to act, but it is not yet a real action, this state of things can become [6]. Studies in Jordan show that more than half (50.9%) of the participants stated that they stopped taking antibiotics when they felt better [14]. This shows the attitude towards the use of antibiotics.

Respondents' adequate knowledge about antibiotics was identified to correlate positively with attitude, which is consistent with previous studies, where appropriate knowledge of antibiotics was identified to be a predictor for positive attitude towards antibiotic use. The study found that there was a significant positive correlation between respondents' knowledge and attitude towards the use of amoxicillin antibiotics. Good knowledge about the use of antibiotics has a positive attitude towards amoxicillin antibiotics affecting patient compliance. These results are in line with Jifar's research, 2018 explaining that respondent exhibited poor knowledge and attitude toward antibiotics use. There were also malpractices such as failing to take full dose [14]. Knowledge is influenced by the experience of someone, factors outside the person (environment), both physical and non-physical and socio-cultural which are then known, perceived, believed to cause motivation and intention to act [15].

## Conclusions

Knowledge has a significant effect on patients' compliance in using amoxicillin antibiotics. While attitude has insignificant effect on patients' compliance in using amoxicillin antibiotics in Arjuno Primary Health Care Center, Klojen Disict, Malang city. Furthermore, knowledge and attitudes of patients, together significantly influence their compliance in using amoxicillin antibiotics and their influence level is 16.7%.

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FINAL GRADE

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GENERAL COMMENTS

**Instructor**