



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Research Article

September 2019 Vol.:16, Issue:2

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The Connection Between the Level of Knowledge and the Correct Use of Oral Antibiotics on Adult Patients at Malang Health Center (Puskesmas Kota Malang)



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals



ISSN 2349-7203

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Submission: 29 August 2019
Accepted: 5 September 2019
Published: 30 September 2019



HUMAN JOURNALS

www.ijppr.humanjournals.com

Keywords: Oral Antibiotics, Level of Knowledge, Correct Use, Adult Patients

ABSTRACT

Infectious disease which is caused by bacteria is one of the biggest health problems in Indonesia, in which the medications require antibiotics. The inevitable consequence ensuing the incorrect use of oral antibiotics is the emerging resistant microorganism. One of the factors that can affect the correct use of antibiotics is the level of knowledge. The objective of this study is to understand the connection between the level of knowledge and the correct use of antibiotics on adult patients at the Malang Health Center, using 100 respondents selected based on predetermined inclusion and exclusion criteria. This study applied analytic observational method along with cross sectional approach. The result of study was obtained by connecting the total score of the questionnaires on the adult patients' level of knowledge to the correct use of oral antibiotics, where the level of knowledge could be categorized into good, fair, and poor meanwhile the correct use of oral antibiotics was categorized into correct and incorrect. There were 67% respondents with good knowledge, 30% respondents with fair knowledge, and 3% respondents with poor knowledge. Meanwhile, the result of the questionnaire on the correct use of oral antibiotics showed about 86% respondents with incorrect use and 14% respondents with correct use. The analysis of data used Somers'd test and obtained significant value as much as 0.007 ($p < 0.05$) which indicated there was a significant connection between the level of knowledge and the correct use of oral antibiotics on adult patients. The obtained coefficient value of the correlation was 0.268 which indicated a weak positive connection between two variables. The study concludes that there is a significant positive connection between the level of knowledge and the correct use of oral antibiotics on adults at Malang Health Center.

INTRODUCTION

One of the world's greatest health problems ranks at the 1st position that imposes the citizens of the developing world including Indonesia and needs antibiotics medication is bacterial infection. The ensuing consequence of incorrect use of oral antibiotics is the emerging resistance of bacteria. According to data from WHO (2008), Indonesia ranked at the 8th position from 27 countries where high antibiotics resistance incidents occurred¹.

Adult (non-adolescence) knowledge plays an important role in the correct use of antibiotics. It is a crucial domain in forming behaviors (over behavior)². The borderline of correct antibiotics use is whenever it complies several criteria such as the correct usage, dosage, storage, follow-up, and also precaution of the medicine's side effect³.

Based on the study conducted at the Rampal Celaket Health Center, Malang, it shows that there is a linear connection between knowledge and irrational behaviour in using antibiotics where there were 26 respondents (49%) with poor knowledge, 37 respondents (70%) who never get information about the danger of antibiotics resistance, and 36 respondents (68%) commit irrational use of antibiotics⁴.

According to Hadinegoro (2002), approximately 40-62% antibiotics are used incorrectly for illness such as flu, cough or diarrhea⁵.

Based on the aforementioned problems, a study was conducted to analyze the connection between the correct use of oral antibiotics on adult patients at Malang Health Center. As a basic health service, a health center is a health facility that serves communities and distributes in many places.

MATERIALS AND METHODS

This study uses observational study with analytic survey design and applies cross-sectional approach between the level of knowledge and the correct use of oral antibiotics on adult patients at Malang Health Center and measured in concurrent time using questionnaires.

Sample selections on 4 districts in Malang were taken using stratified random sampling method according to the districts and obtained as many as 10 health centers. Meanwhile adult respondent selections were taken using purposive sampling method according to determined

inclusion and exclusion criteria and calculated based on binominal proportion formula, therefore, the total samplings were 100 respondents.

Independent variable of this study was the knowledge level of adult patients with the dependent variable was the correct use of oral antibiotics.

The study utilized instruments in the form of questionnaires comprising three types of questionnaires; socio-demography questionnaire, a questionnaire to measure the level of respondents' knowledge connected to oral antibiotics consisting 10 questions with 9 indicators such as definition, name, purpose of use, dosage, length of medication, potential side effects, antibiotics resistance, antibiotics classification, and storage conditions. Meanwhile, the questionnaire on the correct use of oral antibiotics consisted of 12 questions with 5 indicators such as correct usage, length of medication, proper follow-ups, proper storage conditions, and precaution of the medicine's side effect. Each question would be scored as 1 if the answer was correct and 0 if the answer was incorrect.

Inclusion criteria determined for respondents above 18 years old agreed to be the respondents for the study, filled the questionnaires, able to do spoken and written communication, adult patients who had ever been prescribed for oral antibiotics at the health center, and outpatients who were under oral antibiotics therapy at the Malang Health Center. Exclusion criteria were the patients' families who represented the patient to purchase medicines, adult patients who worked as health workers (physicians, dentists, apothecaries, technical pharmacists, midwives, nurses, and nutritionists), and in patients who were treated with oral antibiotics therapy at Malang Health Center.

Respondents who had complied the inclusion criteria, therefore, would be given informed consent and questionnaires for data sampling.

Reliability and validity tests were conducted on the questionnaires of the knowledge level and the questionnaire of the correct use by using 30 respondents similar in criteria with the subject sampling however these could not be included in the study samplings when correlation test was conducted. The other data was analyzed using SPSS IBM 20.

Data analysis was conducted by categorizing the results of each questionnaire. The knowledge level category could be seen on Table 1. The correct use category was categorized

into correct and incorrect. If it complied less than 5 criteria and scored under 12, therefore, it would be incorrect and if it scored 12, therefore, it would be stated as correct.

Table No. 1: Category of Knowledge Level

Score	Category
76-100%	Good
50-75%	Fair
<50%	Poor

Correlation test used was the *Somers'd* test if the data did not normally distribute and *Chi-Square* test if the data distributed normally. There was a connection between two variables if the significance value was $(p) < 0.05$.

RESULTS AND DISCUSSION

RESULTS

Data sampling on this study was taken at health centers located on 4 districts of Malang Municipality. There were 2 health centers selected for each district, therefore, the total of the health centers were 10 centers; 2 health centers at Sukun District, 2 health centers at Blimbing District, 2 health centers at Kedungkandang District, 2 health centers at Lowokwaru District, and 2 health centers at Klojen District. Total respondents were 100 people for 10 health centers as detailed in Table 2.

Table No. 2: Total Respondents at Each District Health Centers in Malang

No	District	Health Centers	Respondents
1.	Lowokwaru	2	20
2.	Blimbing	2	20
3.	Klojen	2	20
4.	Sukun	2	20
5.	Kedungkandang	2	20

In this study, the demography questionnaire comprised patient names, age, sex, last education, occupation, monthly income, and type of oral antibiotics taken. The detailed data of respondent demography could be seen in Table 3.

Table No. 3: Demography Data of the Respondents

	Total (n)	Percentage (%)
Sex		
Male	36	36.00%
Female	64	64.00%
Age		
>18-30 y/o	31	31.00%
>30-50 y/o	41	41.00%
>50 y/o	28	28.00%
Last Education		
Elementary/equivalent	24	24.00%
Junior High/equivalent	12	12.00%
Senior High/equivalent	47	47.00%
Vocational/Undergraduate/equivalent	17	17.00%
Occupation		
Unemployed	15	15.00%
Students/College Students	11	11.00%
Civil Servants	10	10.00%
Private Employees	28	28.00%
Housewives	36	36.00%
Monthly Income		
≤ Rp1,000,000	35	35.00%
> Rp1,000,000-Rp2,500,000	41	41.00%
> Rp2,500,000-Rp5,000,000	18	18.00%
≥ Rp5,000,000	6	6.00%
Obtained Antibiotics		
Amoxicillin tabs 500 mg	85	85.00%
Co-Amoxiclav caps 625 mg	4	4.00%
Azithromycin caps 500 mg	1	1.00%
Cotrimoxazole tabs 480 mg	3	3.00%
Erythromycin caps 500 mg	2	2.00%
Chloramphenicol caps 250 mg	1	1.00%
Metronidazole tabs 500 mg	1	1.00%
Thiamphenicol caps 500 mg	3	3.00%

Majority of the respondents were female as much as 64.00% (64 respondents), mostly ranged >30-50 years old as much as 41.00% (41 respondents), last educations were mostly SMA/MA/SMK/equivalent (senior high schools) as much as 47.00% (47 respondents), majority were housewives as much as 36.00% (36 respondents), the monthly incomes were mostly >Rp1,000,000-Rp2,500,000 as much as 41.00% (41 respondents), and oral antibiotics

obtained by the respondents were mostly Amoxicillin tablets 500 mg as much as 85.00% (85 respondents).

Respondents' Level of Knowledge

Based on the obtained result of study, data resulted from the questionnaire on the knowledge level of adult patients related to oral antibiotics was shown in Table 4.

Table No. 4: Questionnaire Result on Respondents' Level of Knowledge

No.	Question	Correct (%)	Incorrect (%)
1.	Antibiotics Definition	70.00%	30.00%
2.	Medicine Name	91.00%	9.00%
3.	Purpose of Antibiotics Use	54.00%	46.00%
4.	Usage of Antibiotics	99.00%	1.00%
5.	Length of Antibiotics Use	83.00%	17.00%
6.	Potential Side Effect	81.00%	19.00%
7.	Antibiotics Resistance	89.00%	11.00%
8.	Medicine Classification	63.00%	37.00%
9.	Antibiotics Storage	88.00%	12.00%

It could be comprehended that there were 67.00% respondents having good knowledge, 30.00% of respondents having fair knowledge, and the rest 3.00% respondents having poor knowledge.

Level of Respondents' Oral Antibiotics Correct Use

Based on the study result, the questionnaire result on the level of the correct use of oral antibiotics of the adult patients at Malang Health Center was shown in the table below:

Table No. 5: Questionnaire Result on the Correct Use of Oral

No.	Question	Correct (%)	Incorrect (%)
1.	Correct Usage	77.25%	22.75%
2.	Correct Length of Use	73.50%	26.50%
3.	Correct Storage	76.00%	24.00%
4.	Correct Follow-ups	79.00%	21.00%
5.	Precaution on the Side Effect of the Medicine	83.00%	17.00%

It could be comprehended that most respondents who took oral antibiotics incorrectly were as much as 86.00% (86 respondents) and 14.00% (14 respondents) taking oral antibiotics correctly.

Normality Test

In this study, normality test was conducted by using *One-Sample Kolmogorov-Smirnov Test* technique with significant p-value obtained for the questionnaire of the knowledge level of the respondents and the questionnaire of the correct use of oral antibiotics $0.000 < 0.05$ which meant it did not distribute normally.

Correlation Test

Correlation Test used was *Somers'd Test* with p-value $0.007 < 0.05$ so there was a connection between the level of knowledge and the correct use of oral antibiotics on adult patients. The obtained coefficient correlation value was 0.268, which meant the correlation between the respondents' level of knowledge and the correct use of oral antibiotics was poor.

Cross Tabulation between the Level of Knowledge and the Correct Use of Oral Antibiotics

Table No. 6: The Result of *Somers'd* Statistics Test between the Level of Education and the Correct Use of Oral Antibiotics

Data	Significance Value	Description
Connection between the Level of Education and the Correct Use of Oral Antibiotics	0.005	Significant

The significance value obtained was as much as $0.005 < 0.05$ using *Somers'd* statistics test, therefore, could be concluded that there was a connection between the level of education and the correct use of oral antibiotics with the obtained correlation coefficient value as much as 0.951 which meant the close proximity of the connection correlated perfectly.

Cross Tabulation between Occupations and Correct Use of Oral Antibiotics

Table No. 7: The Result of Lambda Statistics Test between Occupation and Correct Use of Oral Antibiotics

Data	Significance Value	Description
Connection between of Occupation and Correct Use of Oral Antibiotics	0.259	Not Significant

Significance value as much as 0.259 was obtained by using Lambda statistics test. According to Dahlan (2011), probability p-value which was lesser than 0.05 showed significant result⁶. Therefore, it could be concluded that there was no connection between the occupation and the correct use of oral antibiotics.

DISCUSSION

Based on Table 3, by comparison the majority of female respondents were as much as 64.00% (64 respondents) and male respondents as much as 36.00% (36 respondents). According to the research conducted by Shazu (2014) which showed that female respondents concerned over health more than male respondent did⁷. Respondents' last education was mostly senior high school/equivalent (SMA/MA/SMK) as much as 47.00% (47 respondents) and the majorities were housewives as much as 36.00% (36 respondents). Furthermore, the majority of the respondents' monthly incomes were between Rp1,000,000 to Rp2,500,000 with the percentage as much as 41.00% (41 respondents). A person's income has no direct effect to the level of knowledge. However, if someone has high income, therefore, the person shall afford information source⁸. Most of oral antibiotics obtained by the respondents was Amoxicillin tablets 500 mg with the percentage as much as 85.00% (85 respondents). This medicine is generally used for various infections and serves as the first line therapy for acute otitis media, child pneumonia, acute bacterial sinusitis, and gastritis caused by the infection of *Helicobacter pylori*⁹.

Based on the result of study, there were 67.00% (67 respondents) had good knowledge, 30.00% had fair knowledge, and the rest 3.00% had poor knowledge. It was corresponded with the research conducted by Mahardhika and Yeni (2018) at 2 health centers in Karanganyar, where there were 81.80% and 76.40% respondents with good knowledge, 17.10% and 23.30% respondents with fair knowledge, and 1.10% and 0.40% respondents

with poor knowledge with p values as much as 0.0001 dan 0.003, therefore it could be concluded that there was a connection between the inpatients' level of knowledge and the use of antibiotics at the health centers in Karanganyar¹⁰.

Based on the questionnaire result of the correct use of oral antibiotics, most respondents who used oral antibiotics incorrectly as 86.00% (86 respondents) and correctly as much as 14.00% (14 respondents). The result was corresponding with the previous research reported by Rianti (2014) related to the use of antibiotics at the Bahteramas Provincial Hospital, South East Sulawesi on Acute Respiratory Infection cases (ISPA) where 84.97% indication was incorrect, 54.96% medicine was incorrect, and 6.66% dosage was incorrect¹¹. Meanwhile, the rationality of medication at Poasia Health Center of Kendari related to ISPA was only 71.20% correct medicine and 95.70% correct dosage¹².

Data was known as not distributing normally after being tested with *One-Sample Kolmogorov-Smirnov Test* therefore *Somers' d* correlation test was being used. The p-value in this study was 0.007 ($p < 0.05$), therefore it could be concluded that there was a significant positive connection between the level of knowledge with the correct use of oral antibiotics on adult patients. The result corresponded with the research conducted by Huang *et al.* (2013) with the *Chi-Square* analysis result with significance value $p = 0.004$ ($p < 0.05$), it showed that there was a positive correlation between level of knowledge and a persons' behavior in using antibiotics¹³. The better the knowledge, the better the behavior and attitude of a person.

The conducted cross tabulation result showed that there was a connection between the level of education with the correct use of oral antibiotics indicated by p value=0.005. According to So Sun *et al.* (2011), respondents' awareness are 2.39 times higher in using antibiotics correctly if graduated from college compared to those who graduated from elementary level¹⁴. Notoatmodjo (2011) stated that the higher the education, the higher the knowledge².

The result of cross tabulation showed that there was no connection between occupation and correct use of oral antibiotics indicated by the probability p-value as much as 0.259. According to Nursalam (2008), an occupation is taken up to support living¹⁵. Occupation outcome is the income that affect the level of knowledge of the respondents directly, so the occupation can either directly affect the respondents' knowledge or not. It can be furtherly concluded that the knowledge level factor affects the correct use of oral antibiotics,

meanwhile the occupation factor does not affect the correct use of oral antibiotics on adult patients at Malang Health Center.

CONCLUSION

Based on the result of study that had been conducted, it can be concluded that there is a significant positive connection with poor correlation level between the level of knowledge and the correct use of oral antibiotics on adult patients at Malang Health Center.

According to the result of the study, it can be suggested to carry out dissemination, communication, information and education about oral antibiotics to the public comprehensively so people can acknowledge and understand about how to use oral antibiotics correctly. It is to disseminate how to be wiser in using oral antibiotics. Further study on the connection between the correct use of oral antibiotics and the success of antibiotics therapy is also suggested.

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