JMPF Vol. 9 No. 2 : 126-134
ISSN-p : 2088-8139
ISSN-e : 2443-2946

The Depiction of Antibiotic Use without Presciption and Community Attitudes towards Drugstores that Refused to Sell Antibiotic without Prescription

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Submitted: 01-04-2019 *Revised: 14-05-2019* *Accepted: 20-06-2019*
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ABSTRACT

Antibiotic resistance causes reduced therapeutic effectiveness. Understanding of people's behavior plays an important role in countering antibiotic resistance especially by preventing irrational use of antibiotics. The purpose of the study was to depict the experience of respondents in using antibiotics without prescription and the relationship of characteristics of respondents with unwillingness to remain a customer at a pharmacy that had refused to provide antibiotics without a prescription. The study design applied cross-sectional using a questionnaire, and sampling was done by purposive sampling. Respondents were people who used antibiotics without a doctor's prescription. The survey was conducted in Yogyakarta in September-October 2018. The data were analyzed descriptively and used multivariate logistic regression. As many as 44.2% of the total 670 respondents used antibiotics the last time more than a year ago; 69.5% received information about antibiotics from previous treatments; 93.4% received antibiotics from pharmacies, and 69.2% stated that the most used antibiotic was amoxicillin. More than half (62.2%) of respondents were still willing to become customers at a pharmacy that had refused to provide antibiotics without a prescription. Respondents with high school education or lower as the latest education degree (OR = 1.513; 95% CI 1.017-2.252); from family income below the regional minimum wage (OR = 1.858; 95% CI 1.302-2.651), and from Sleman Regency (OR = 1.457; 95% CI 1.016-2.089) became a predictor of the unwillingness of respondents to become customers at a pharmacy who had refused to provide antibiotics without a prescription. Supervision of antibiotic (especially amoxicillin) in pharmacies and education to the community needs to be used as part of a strategy against irrational use of antibiotics. In addition, education needs to be given to pharmacists to reduce fears of decreased in the number of their customers because they refuse to deliver antibiotics without a prescription.
Kata kunci: experience, behavior, rejection, non-prescribed antibiotics.

INTRODUCTION

The incidence of antibiotic resistance continues to increase and has become a threat to serious global health problems[1]. This antibiotic resistance will result in a decrease in therapeutic effectiveness and an increased risk of treatment failure, causing eradication of the infection to be more difficult, increasing the cost of care, and a longer duration of treatment[2].

The World Health Organization recommends a strategy in preventing antibiotic resistance, which is the need to educate the public about the correct use of antibiotics. Misperception from the community and low adherence to treatments are factors that contribute to the increasedprevalence of antibiotic resistance[2]. Therefore, the community plays a large role in the prevention of resistance, and data on the level of knowledge and behavior of the community regarding antibiotics is needed in the formulation of strategies to prevent antibiotic resistance[3,4]. In-depth understanding of the differences in knowledge and behavior of different groups in one population such as differences in age and education is needed to develop a campaign that is more effective, more informed and targeted[5].

Community access to antibiotics without prescriptions is one of the causes that contribute to people's behavior in overusing antibiotics[6,7]. Several studies in Indonesia show that people can still access these antibiotics without prescriptions[8,9], although applicable regulations state that antibiotics are drugs that only patients with prescription can

get (prescription drugs)[10]. On the other hand, pharmacies often worry about losing customers if they refuse antibiotic requests without a prescription from a patient. Many existing studies have assessed the knowledge and behavior of the community towards the use of self-medication with antibiotics in various countries[1,4,5,11–13], however, similar studies have not been conducted in Indonesia. This research is different from previous research because it is more focused on knowing the experience of people who have used antibiotics without prescriptions.

Understanding of people's behavior plays an important role in preventing irrational use of drugs and the occurrence of antibiotic resistance. Therefore, the aim of the study is to describe the experience of antibiotic use without prescription and the relationship between the characteristics of respondents with a willingness to become a regular customer in a pharmacy that had refused to submit antibiotics without a prescription.

METHODS

The design of this study was a cross-sectional research using questionnaires. Sampling was carried out by purposive sampling by 8 surveyors who had previously obtained an explanation of the data collection process. The sample inclusion criteria were respondents aged 18 years or over, had used antibiotics that were obtained without a prescription, and were willing to sign an informed consent. Exclusion criteria were respondents who had jobs related to medic. The survey was anonymous and carried out in 2 regencies in Yogyakarta, namely Sleman and Bantul Regencies, from September to October 2018. Ethical eligibility was obtained from the Research Ethics Commission of the Faculty of Dentistry UGM (registration number 001564/KKEP/FKG-UGM/EC/2018).

Research instruments

The research questionnaire was divided into 3 parts. Part 1 contains 6 questions regarding the demographic characteristics of the respondents, namely age, gender, recent education, family income, whether there was a family member who works as health workers, and the origin of the respondents. Part 2 contains 4 questions about the experience of respondents in using antibiotics without prescriptions including when they last consumed antibiotics without a prescription, sources of information about antibiotics, sources of obtaining antibiotics, and types of antibiotics purchased without a prescription. Section 3 contains 2 questions about whether the respondent had ever encountered a pharmacy that refused to give antibiotics without a prescription and whether the respondent was still willing to be a customer at a pharmacy that had refused to submit antibiotics without the prescription.

Numbers of sample

The minimum numbers of sample was 377 respondents. The minimum numbers of sample measurement was carried out using Raosoft sample size calculator software with criteria in the form of 5% margin of error, 95% confidence level, and 50 response distribution[14].

Data analysis

Data was entered into Microsoft Excel manually and analyzed descriptively. The comparison between the numbers of respondents who had encountered a pharmacy who refused to submit antibiotics without a prescription with respondents who remained willing to become customers at the pharmacy was performed with the help of pivot in Microsoft Excel.

The analysis of the relationship between the characteristics of respondents and the unwillingness of respondents to become customers at a pharmacy who had refused to submit antibiotics without a prescription was carried out using multivariate logistic regression. Bivariate analysis was first carried out for each of the independent variable with

Table I. Research Respondent Characteristics

Characteristics of Respondents	n	%
Sex		
Male	263	39.3
Female	407	60.7
Age (years)		
18-29	310	46.3
30-39	119	17.8
40-49	135	20.1
>50	106	15.8
Education		
High school or lower	485	72.4
University	185	27.6
Family income		
Under UMR	390	58.2
Above UMR	280	41.8
Have family member who works in medical field		
Yes	196	29.3
No	474	70.7
Origin of respondents		
Bantul Regency	213	31.8
Sleman Regency	457	68.2

Notes: UMR = regional minimum wages

the dependent variable using simple logistic regression bivariate analysis. Variables with $p<0.25$ in bivariate analysis were included in multivariate logistic regression. Only the results of the multivariate logistic regression analysis were reported. P-value as much as 0.05 or less were considered insignificant statistically.

RESULTS AND DISCUSSION

There were 670 respondent data that could be obtained and analyzed. The majority of respondents were 18-29 year old (46.3%), female (60.7%), had attained high school degree or lower (73.4%), family income below the regional minimum wages (58.2%), not having family members who work in medical field (70.7%), and originating from Sleman regency (68.2%) (Table I).

Table II shows the respondents experience in using antibiotic without any prescription. The majority of respondents stated the last time they had consumed the antibiotic was more than a year prior (44.2%). This could be caused by the number of the rational use of antibiotics campaign. Other research suggests that systematic campaign activities can be used to increase knowledge and change people's behavior in regards to antibiotics[3].

The majority of respondents (69.5%) had received information about antibiotics from previous treatments. Other research also shows that antibiotic use without prescription can also occur because patients use the remaining antibiotics from previous treatments[5]. Public education needs to be emphasized that the same symptoms are not necessarily due to the same illness, so a doctor's diagnosis is needed first.

In Indonesia, antibiotics are considered Prescription Only Medicine (POM) that should only be handed over to patients who carry prescriptions[10], but as many as 93.4% of respondents had said they received antibiotics from pharmacies. The procurement of

Table II. Experience of Respondents using Antibiotics without a Prescription

Statement	Category	n	%
When was the last antibiotic used without prescription (n=667)	≤ 1 month ago	117	17.5
	2 – 6 months ago	172	25.8
	7 – 11 months ago	83	12.6
	≥ 12 months ago	295	44.5
Source of information about antibiotics (n=665)	Previous disease experience	462	69.5
	Advice from family/other people	183	27.5
	Information from internet	21	3.2
Source of getting antibiotics (n=668)	Pharmacy	624	93.4
	Drug store/stall	35	5.2
	Family	6	0.9
	Leftovers from previous treatment	3	0.4
Types of antibiotics purchased without prescription (n=637)	Amoxicillin	441	69.2
	Fradiomicyn-Gramicidin	147	23.1
	Ciprofloxacin	15	2.4
	Tetracycline	12	1.9
	Cefadroksil	8	1.3
	Metronidazole	6	0.9
	Cefixim	3	0.5
	Levofloxacin	2	0.3
	Gentamicin	1	0.2
	Ketaconasol	1	0.2
	Sulfamethoxazole-Trimetoprim	1	0.2

prescription antibiotics at pharmacies does not only occur in Indonesia but also in several other countries both in low-income countries (such as Ethiopia[15]), middle-income countries (such as Thailand[16] and Bangladesh[17]), and also high-income countries (such as Portugal[18]). The results of a systematic review of the prevalence of prescription-free antibiotics range from 19% to 82%[19] in the Middle East and 38.8% in developing countries[20]. In addition, 5.2% of the respondents stated that they obtained antibiotics from drugstores and local vendors even though they were not the authorized distributors according to the existing regulation. Other research in Surabaya also found that antibiotics could be found at a drugstore or a local vendor[9].

The type of antibiotic that was often found and used was amoxicillin (69.2%). This research is in line with other studies where amoxicillin is the most commonly used antibiotic in self medications by antibiotics such as research conducted in Sri Lanka[21], Saudi Arabia[22], Vietnam[23]. In addition, Amoxicillin is also the most widely prescribed antibiotic by pharmacies to patients in other countries such as Zambia[24] and Syria[25].

Number of respondents comparisons who had encountered a pharmacy that refused to give antibiotics without a prescription with respondents who refused to return to the pharmacy (Table III). As many as 65.2% of respondents had encountered a pharmacy that refused to serve antibiotic purchases without a prescription. The biggest reason the pharmacists giving over the hard drug without prescription is because if a pharmacy does not provide the drug, another pharmacy will provide the drug[26]. Therefore, pharmacists often worry about losing their customers. However, in this study it was seen that more than half of the respondents (62.2%) who had been refused to buy a pharmacy without a prescription, were still willing to become customers at the pharmacy.

Table III. Comparison of the number of respondents who had encountered a pharmacy that refused to give antibiotics without a prescription with respondents who were not willing to return to the pharmacy

Statement		I am still willing to be a customer at a pharmacy that has never refused to give antibiotics without a prescription		
		Yes n (%)	No n (%)	Total n (%)
I once met a pharmacy that refused to give antibiotics without a prescription	Yes	270 (40,3)	167 (24,9)	437 (65,2)
	No	147 (21,9)	86 (12,8)	233 (34,8)
	Total	417 (62,2)	253 (37,8)	670 (100,0)

Pharmacies that do not submit antibiotics without a doctor's prescription are pharmacies that practice according to applicable regulations. Submission of hard drugs such as prescription antibiotics is the cause of increased use of irrational drugs[6]. This results in waste of resources, increases the risk of resistance of pathogenic bacteria, and causes serious health hazards such as unwanted drug reaction (adverse drug reaction) and could aggravate the disease[27]. Therefore, education needs to be given to the public regarding the prohibition of antibiotic surrender without prescription and the disadvantage of using antibiotic without prescription.

People with high school as the highest education attainment or lower (OR = 1.513; 95% CI 1.017-2.252), family income below the regional minimum wage (OR = 1.858; 95% CI 1.302-2.651), and the origin of respondents from Sleman Regency (OR = 1,457; 95% CI 1,016-2,089) became the predictor of the attitude of the respondents refusing to remain customers at the pharmacy who had refused to submit antibiotics without a prescription (Table IV). This community group is a group of people who do not understand the regulation of antibiotics, have a low awareness of antibiotics and a lack of understanding of the risks of antibiotic use without prescription so that these community groups needs more attention in educational activities.

This study adds information that can be used to formulate a strategy to reduce antibiotic use without a prescription. In the distribution of antibiotics without prescription, pharmacies are the biggest source for community to access antibiotics so that monitoring from the regulator is needed to prevent this. An antibiotic item that is widely used for self-medication by the community, namely amoxicillin, requires more stringent supervision from the regulator. Other research also shows the same thing[28]. In addition, this study also found statements of respondents who received antibiotics from drugstores and stalls. This is an illegal distribution because hard drugs can only be handed over by the pharmacists[10] so it needs to be explore further on how the drug store/stall gets an antibiotic supply. Data on respondents' characteristics indicate that certain groups of people, namely women, aged 18-29, high school or lower education, and income below the minimum wage are the majority group and are susceptible to antibiotic without prescription use so it needs to get priority in education or campaigns against antibiotic resistance. The majority of respondents also stated that the main source of information about antibiotics was previous disease experience so that information about the same symptoms is not necessarily caused by disease and requires a doctor's diagnosis first to be part of public education. Future research can be focused on assessing the effectiveness of interventions (education, campaigns or similar activities) on the use of antibiotics without prescription.

Table IV. Multivariate logistic regression analysis between respondent's characteristic for respondents who were unwilling to return to the pharmacy that had refused to give antibiotics without a prescription

Characteristics of Respondents	Category	OR	95% Cl for OR	p-value
Age (years)	18-29	0.853	0.531-1.369	0.510
	30-39	1.354	0.782-2.345	0.279
	40-49	1.095	0.640-1.874	0.741
	>50	1.000		
Sex	Male	1.000		
	Female	0.749	0.534-1.049	0.093
Education	College or Vocational School	1.000		
	High school or lower	1.513	1.017-2.252	0,041*
Income	> Minimum Wage	1.000		
	< Minimum Wage	1.858	1.302-2.651	0,001*
Origin of respondents	Bantul Regency	1.000		
	Sleman Regency	1.457	1.016-2.089	0,041*

Notes: * Statistically significant effect (<0.05)

World Health Organization stated that strategies to fight antibiotic resistance require interventions directed at all parties who can play a role in the occurrence of antibiotic resistance and need to take part in solutions, namely prescribers, pharmacists, veterinarians, patients / communities, policy makers in hospitals, public health, pharmaceutical industry and government[2]. This research shows that in addition to the need for public education, the community pharmacists also need an education in delivering antibiotics. More than half of the respondents were still willing to remain customers at pharmacies who had refused to give antibiotics without a prescription to them. If the pharmacist in the community pharmacy agrees not to submit antibiotics without a prescription, then the pharmacist's concern for losing customers can be minimized. In addition, certain groups of patients namely high school education or lower and having an income below the minimum wage need an explanation so that they can understand the reasons of the refusal by the pharmacy and the group of patients willing to remain customers at the pharmacy.

This study has several limitations. First, as with other surveys of the community, data obtained from questionnaire tools are based on self-reporting by respondents who are highly dependent on honesty and the ability of respondents to remember and understand the items in the questionnaire. In this study there were 35 respondents (5.2%) who forgot the name of the antibiotics they had used. Second, the strength of this study is in the selection of respondents who were limited to people who had used antibiotics without a prescription. This is what distinguishes this research from other studies that make the general public as a population. The selection of non-random samples with purposive sampling will reduce the ability to generalize to the general public. However, despite the limitations of existing research, the findings of this study provide additional important information for the development of strategies and education that are more effective for the community to reduce irrational use of antibiotics.

CONCLUSION

As many as 44.2% of respondents from a total of 670 respondents used antibiotics last time more than a year ago, 69.5% received information about antibiotics from previous treatments, 93.4% received antibiotics from pharmacies, and 69.2% stated that antibiotics were the most widely used is amoxicillin. Although there are pharmacies that refuse to submit antibiotics without a prescription, more than half (62.2%) of the respondents are still willing to become customers at the pharmacy. Respondents with the last high school education or lower (OR = 1,513; 95% CI 1,017-2,252), family income below the regional minimum wage (OR = 1,858; 95% CI 1,302-2,651), and came from Sleman Regency (OR = 1,457; 95% CI 1.016-2.089) became the predictor of the attitude of respondents who were not willing to be customers at a pharmacy who had refused to submit antibiotics without a prescription. Monitoring the delivery of antibiotic amoxicillin in pharmacies and educating the public who are vulnerable to using antibiotics without prescriptions (women, aged 18-29, high school education or lower, and income below the minimum wage) should be used as part of a strategy against irrational use of antibiotics. There is also a need of education for pharmacists to reduce the concern of losing customers due to refusal to submit antibiotics without any prescription.

ACKNOWLEDGEMENT

This research was funded by the Young Lecturer Research Grant, Faculty of Pharmacy, Universitas Gadjah Mada in 2018 with UGM / FA / 1965.k / M / 05/01 contract numbers.

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