

Knowledge and Attitude towards Antibiotic Use among College Students in Jatinangor

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Abstract

Background: Lack of knowledge about antibiotics cause people to have a misconception about the use of antibiotics. This may potentially lead to inappropriate use of antibiotics in the community, which is the major reason for the spread of antibiotic resistance. This study aimed to assess knowledge and attitudes toward antibiotic usage among non-medical students in Jatinangor.

Methods: This study used a cross-sectional, questionnaire based survey conducted among non-medical college students in Jatinangor, sub-district of Sumedang regency, from September to October 2013. Samples were selected using convenience sampling method, with a total number of 250 samples.

Results: More than half of the respondents (56.4%) had a poor knowledge regarding antibiotic use. Respondents who knew that antibiotics was indicated to treat bacterial infections reached 75.2%, although 58.4% of respondents still believed that antibiotics could be used in viral infection. In terms of antibiotic resistance, 72% of respondents were aware that overused of antibiotics could cause antibiotic resistance. In addition, respondents were generally found to have more positive attitudes toward antibiotics with results over 50%, whereas more than one-third of the respondents wrongly self-medicated themselves with antibiotics.

Conclusions: This study reveals that most of the respondents have poor knowledge regarding antibiotics. Almost half of the respondents have a negative attitude regarding the use of antibiotics. Educational interventions are needed to promote prudent use of antibiotics among the college students.

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Keywords: Antibiotic use, attitude, Jatinangor, knowledge

Introduction

Infectious diseases are one of the major causes of death in the world. Death due to acute respiratory infection, diarrhea, measles, Acquired Immune Deficiency Syndrome (AIDS), and tuberculosis account for 85% of all mortality from infection worldwide.¹ Antibiotic is the most used drug in infection caused by bacteria.² Currently, high intensity in irrational use of antibiotics has caused development of antibiotic resistance. It causes pathogen that cannot be cured by the same antibiotics and needs a different class of antibiotics, which makes the effectiveness of antibiotics decreases.³ Besides mortality and morbidity, antibiotic resistance also affected

the economic and social aspects. According to the World Health Organization (WHO), 440.000 new cases of resistance occur each year. This issue has become a global problem and needs serious attention.⁴

Irrational use of antibiotics can be self-medication by the community. Self-medication by the community has been increasingly widespread⁴, and the prevalence is quite high varying between 9%–18% in various European countries,⁵ as well as in Indonesia⁶ where about 16% of antibiotics is obtained without prescription. In Indonesia, uncontrolled use of antibiotics is mainly due to insufficient control on the sale, whereas the Indonesian Government restrict antibiotic availability that it could only be prescribed by a practitioner.⁷

People's misconception of antibiotics can

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also potentially lead to inappropriate self-medication practice.⁸ This is in accordance with some studies conducted in Penang Malaysia and Yogyakarta which revealed 55% and 49% of respondents respectively who have less knowledge about the appropriate use of antibiotics. Knowledge and beliefs are social cognitive factors that influence health-related behavior, including attitude and behavior of using antibiotics. Although knowledge itself is not sufficient to change behavior, but it plays an important role in shaping believe and attitude regarding an appropriate behavior. Reducing misconceptions regarding antibiotic use among the community members is important.⁹⁻¹⁰

Non-medical students in Jatinangor region were one of the components of the community who had high knowledge but might be less exposed to problems associated with the use of antibiotics. Additionally, they were expected to be the generation that would encourage community to have good health behavior. Thus, the study aimed to assess the current knowledge and attitudes towards antibiotic usage among non-medical students in Jatinangor, which could serve as baseline data and provided further insight in planning and developing strategies for local health education purposes.

Methods

This study was a cross-sectional survey using a validated questionnaire from previous studies and was conducted from September to October 2013.⁹ This study has been approved by the Health Research Ethics Committee Faculty of Medicine, Universitas Padjadjaran. The study population was college students in Jatinangor sub-district. The confidence interval was determined at 95% with 10% of margin of error. The minimum effective sample size estimated for the survey was 97 samples.¹¹

A total of 250 questionnaires were distributed to the respondents and samples were selected by using the convenience sampling method. The samples were eligible to be included if they lived in Jatinangor in the period of May–November 2013; were 18–23 years old; and studied in a non-medical faculty. The medical faculties are faculty of medicine, faculty of pharmacy, faculty of nursing, faculty of psychology, and faculty of dentistry. Those who did not meet any of those criteria were excluded from the study.

The distributed questionnaire was adapted from previous studies and had

been modified to adjust to this study.⁹ The questionnaire comprised two parts. Part 1 of the questionnaire consisted of 14 statements to evaluate knowledge towards antibiotic use. Respondents were requested to choose among the three options provided: “Right”, “Wrong”, or “I do not know”. Furthermore, eight statements concerning the respondent’s attitudes toward antibiotic use were included in Part 2. A five-point Likert scale ranging from “Strongly Agree” to “Strongly Disagree” was used to assess the responses of respondents. Positive attitudes would imply the appropriateness of antibiotic usage. The option “Disagree” for statements 1 to 6 and “Agree” for statements 7 and 8 indicated a positive attitude.¹² The respondents for the attitude domain were taken from respondents who knew antibiotics, in this case only the respondents who had chosen the correct answer for question no 1 in the knowledge domain.

Then, all data were coded, entered and analyzed using Microsoft excel 2007. For each correct answer, one point was given, and zero if it was the incorrect answer and “I do not know”, with a maximum obtainable correct score of 14. Respondents with a total score of 75–100% from the maximum score were considered to have good knowledge, 56–75% were considered to have moderate knowledge, while those with a total score of < 55% were considered to have poor knowledge.¹² For the attitude domain, the maximum score was 40 and the result was divided into two categories, “positive” and “negative”.

Result

This study consisted of 250 respondents, and the majority of them (55.6%) were female.

More than half of the respondents (75.2%) knew that antibiotics were indicated to treat bacterial infections, however, 58.4% of respondents believed that antibiotics could be used in viral infection. Meanwhile, 62 % of respondents believed that antibiotics could be used to relieve pain or inflammation, and 36.4 % of respondents agreed that antibiotics could be used to treat fever.

When asked about antibiotic resistance, 72% of respondents knew that overused of antibiotics could cause antibiotic resistance. A total of 73 respondents (29.2%) believed stopped taking antibiotics when the symptom had improved was right, and 12% of respondents still believed that not taking a full course of antibiotics would not affect its effectiveness.

Table 1 Knowledge of Respondent Regarding Antibiotic Use

Questions	Right n (%)	Wrong n (%)	I Do not Know n (%)
Antibiotics are medicines that can kill bacteria.	188 (75.2)	28 (11.2)	34 (13.6)
Antibiotics can be used to treat viral infections.	146 (58.4)	57 (22.8)	48 (19.2)
Antibiotics can cure all infections.	23 (9.2)	136 (54.4)	91 (36.4)
Antibiotics are indicated to relieve pain/ inflammation.	157 (62.8)	55 (22)	38 (15.2)
Antibiotics are used to stop fever.	91 (36.4)	95 (38)	64 (25.6)
Penicillin is an antibiotic.	133 (55.2)	22 (8.8)	95 (38)
Aspirin is a new generation of antibiotic.	51 (20.4)	115 (46)	84 (33.6)
Paracetamol is considered as an antibiotic.	110 (44)	95 (38)	45 (18)
Diphenhydramine / Benadryl is not an antibiotic.	49 (19.6)	40 (16)	161 (64.4)
Overuse of antibiotics can cause antibiotic resistance.	180 (72)	20 (8)	50 (20)
Antibiotics may cause allergic reaction.	182 (72.8)	10 (4)	58 (23.2)
All antibiotics do not cause side effects.	10 (4)	199 (79.6)	41 (16.4)
You can stop taking a full course of antibiotics if your symptoms are improving.	73 (29.2)	158 (63.2)	19 (7.6)
The effectiveness of treatment is reduced if a full course of antibiotics is not completed.	162 (64.8)	30 (12)	58 (23.2)

Most of the respondents (72.8%) were aware of the harmful effect due to antibiotic allergy. As for the identification of antibiotics, more than half of the respondents (55.2%) could identify penicillin as an antibiotic; however 44% of respondents had a misconception regarding paracetamol which they identified as an antibiotic (Table 1)

More than half of the respondents (56.4%) had poor knowledge regarding antibiotic use, and only 17.2% of respondents had good knowledge, and the rest (26.4%) had moderate knowledge about antibiotic use (Table 2).

Regarding the attitude of respondents towards antibiotic use a total of 188

respondents gave the correct answer in the knowledge section (part 1). Respondents were generally found to have more positive attitudes toward antibiotics with over 50% of the results (Table 4).

Meanwhile, the respondents' answer for each statement in the attitude domain shows that more than half of the respondents (52.1%) disagreed to stop using antibiotics when they felt better. However, 23.9% of respondents still agreed to take antibiotics when they had a common cold, 38.3% of respondents believed antibiotics would always be effective in the treatment of the same infection in the future, and 21.3% respondents agreed to take leftover

Table 2 Knowledge Level of Respondent Regarding Antibiotic Use

Level of Knowledge	Number	Percentage (%)
Good	43	17.2
Moderate	66	26.4
Poor	141	56.4
Total	250	100

Table 3 Attitude of Respondent Regarding Antibiotic Use

Attitude	Very Disagree	Disagree	Not Sure	Agree	Very Agree
	n(%)	n (%)	n (%)	n (%)	n (%)
When I get a cold, I will take antibiotics to help me get well more quickly.	50 (26.6)	44 (23.4)	49 (26.1)	31 (16.5)	14 (7.4)
I expect antibiotics to be prescribed by my doctor if I suffer from common cold symptoms.	65 (34.6)	38 (20.2)	42 (22.3)	25 (13.3)	18 (9.6)
I normally stop taking antibiotics when I start feeling better.	69 (36.7)	29 (15.4)	18 (9.6)	41 (21.8)	31 (1.5)
If my family member is sick, I usually will give my antibiotics to them.	41 (21.8)	52 (27.7)	56 (29.8)	26 (13.8)	13 (6.9)
I normally keep antibiotic stocks at home in case of emergency.	42 (22.3)	36 (19.1)	38 (20.2)	49 (26.1)	23 (12.2)
I will use leftover antibiotics for a respiratory illness.	79 (42)	36 (19.1)	33 (17.6)	28 (14.9)	12 (6.4)
I will take antibiotics according to the instruction on the label.	9 (4.8)	11 (5.9)	31 (16.5)	48 (25.5)	89 (47.3)
I normally will look at the expiry date of antibiotics before taking it.	19 (10.1)	4 (2.1)	11 (5.9)	35 (18.6)	119 (63.3)

antibiotics to treat respiratory tract infection (Table 3)

When asked about the compliance, 72.8% of respondents would take an antibiotic in accordance with the instructions on the drug label or from the doctor's prescription, and 81.9% of respondents would look to the expiration date of the antibiotics before using (Table 3).

Discussion

In this study, most of the respondents (75.2%) had appropriate knowledge regarding antibiotic use for bacterial infection which was a little bit lower than the surveys conducted in Malaysia⁹ (76.7%) and in Yogyakarta¹⁰ (76%) but this proportion was higher than the study in Netherlands¹³ (44.6%). It means, the public in general already knew the indication of antibiotics, but they knew less about the

appropriate use of antibiotics as it was proven in this study.

In general (56.4%), respondents had poor knowledge regarding antibiotic use, this was different with the survey conducted in Yogyakarta¹⁰ which shows that most participants had moderate to adequate knowledge regarding antibiotic use. This issue could be taken as our concern because many students who studied in a non-medical faculty received no further instructions on this topic and they were less exposed to the problems of antibiotics.

The misconceptions regarding the indications of antibiotic use, whether bacterial or viral infections seen in this study conformed to other reports in other literatures. The findings showed that the study population was more knowledgeable regarding the indication of antibiotics for the treatment of viral infections. The proportion of respondents

Table 4 Attitude of Respondent Regarding Antibiotic Use

Attitude	Number	Percentage (%)
Positive	100	53.2
Negative	88	46.8
Total	188	100
Total	250	100

who thought that antibiotics were effective for viral infections (58.4%) was comparable with a survey conducted in Penang, Malaysia⁹ and in Yogyakarta, Indonesia,¹⁰ but was higher than proportions reported from Jordan.¹⁴ "The possible reason for inadequacy of knowledge in this area could be due to the term germ, which was normally used by general practitioners or medical staff during medical advice to the public instead of using the microbiological term bacteria or virus".⁹

It was found that the respondents generally lacked the knowledge to differentiate between antibiotics and other commonly used medicines. Although more than half of the respondents (55.2%) could identify penicillin as an antibiotic but 44% of respondents thought that paracetamol is an antibiotic, which was higher than the proportion reported from Penang, Malaysia.⁹ This problem could be caused by several factors, the respondents might be more familiar with trade names than the drug's generic name, due to the lack of information from health care providers as well as from general practitioners.

In the present study 36.4% of respondents believed that antibiotics was used to stop fever, which was comparable with a survey conducted in Yogyakarta, Indonesia¹⁰ and also in Penang, Malaysia.⁹ This study revealed that 62.8% of respondents believed that antibiotics could be used to relieve pain which was close with the survey conducted in New Zealand¹⁵ (66%).

Furthermore, most of the respondents (63.2%) had correct knowledge of the need to take the full course of antibiotics when symptoms were improving which was higher than the study conducted in Jordan¹⁴ (40%). But it was different from their attitude which showed only 52.1 % agreed that they would continue the medication although the symptoms were improving. Therefore, the fact shows that respondents who knew the need to take complete medication of antibiotics did not practice it. This showed that respondents did not completely understand why they needed to take the full course of antibiotics.

This study also revealed that 24.4% of respondents agreed that antibiotics could treat common cold which had lower proportion than surveys conducted in Jordan¹⁴, Turkey¹⁶, and New York.¹⁷ Frequent misuses of antibiotics to treat viral infections which were actually cured by self-medication practice would increase the risk factor of antibiotic resistance.

The uncontrolled use of antibiotics is a well-established reason for antibiotic

resistance.^{1,3} Interestingly, from this study most of the respondents (72%) knew that overused of antibiotics could lead to antibiotic resistance, this finding was comparable with a survey in Portugal⁸ which reported that 70% of respondents knew that inappropriate use of antibiotics could lead to antibiotic resistance, and which was also comparable with a survey in Yogyakarta.¹⁰ In contrast, a study in New Zealand¹⁵ showed just a few (8%) respondents were aware that misused of antibiotics could cause resistance.

This study showed 38.3% of respondents believed antibiotics would always be effective in the treatment of the same infection in the future. Based on a study in Jordan, the possible reason for this statement was their experience on the efficacy of previous treatment.¹⁸ Meanwhile, 21.3% of respondents agreed to take leftover antibiotics to treat upper respiratory tract infection. Leftover antibiotics might be available because of the over-prescription from the doctor or non-compliance of the respondent to complete the treatment. So, it is necessary for physicians to give prescription with the right dosage and also tell the patient to take a full course of treatment and not to use the leftover antibiotics.¹⁹

Moreover, inadequate control over the distribution and sale of antibiotics might contribute to inappropriate antibiotic use. This occurred in several studies, which indicated that antibiotics could be obtained without a prescription at both a pharmacy or over the counter (OTC).²⁰ Antibiotic use without prescription will not only cause resistance but also have another impact such as, adverse effect of the drugs, and high cost of treatment. This means that although the respondents knew the dangers of improper use of antibiotics, they still buy antibiotics without a prescription. Another possible factor that could explain self-medication is the economic aspect, that is to save the clinicians fees.¹⁵ This fits with another study conducted by Buke et al.¹⁶ which stated that knowledge regarding antibiotic usage cannot be evaluated alone since it is not always correlated with behavior.

This study had some limitations. It used convenience sampling, therefore the results could not represent the population. Another limitation was this study had limited time allocation which was only one to two months to collect data.

In conclusion, this study reveals that most of the respondents have poor knowledge

regarding antibiotic use but are still aware of its consequences, such as allergy and resistance. Almost half of the respondents have poor attitude regarding antibiotic use. Therefore, it is necessary to educate the residents of Jatinangor about the worldwide existing problems of antibiotic resistance. Further educational interventions are needed to promote prudent use of antibiotics among the college students and also to improve their understanding and perceptions on antibiotic resistance as well as their attitude towards antibiotic use in Jatinangor area.

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