

Knowledge and Attitudes Regarding Antibiotic Use among Non-medical Students at Wasit University, Iraq

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ABSTRACT

Background: Antibiotic misunderstandings are caused by a lack of antibiotic knowledge. This may contribute to the inappropriate use of antibiotics in the community, which is the leading cause of antibiotic resistance. The purpose of this study was to evaluate the knowledge and attitudes of non-medical students at Wasit University, Iraq, regarding antibiotic usage.

Methods: This study utilized a cross-sectional questionnaire survey conducted from October to December 2022 among non-medical college students at Wasit University, Iraq. A total of 400 samples were selected using the convenience sampling method.

Results:

71.75% of the students had poor knowledge regarding antibiotic use. Respondents who knew that the antibiotics were indicated to treat bacterial infections made up 41% of the sample, although 88% of respondents still believed that antibiotics could be used to treat viral infections. 73% of respondents appeared to be aware that antibiotics may trigger allergic responses, and 48% had no idea antibiotics may possibly cause side effects. In terms of antibiotic resistance, 58% of respondents were aware that overuse of antibiotics could cause antibiotic resistance. There was a strong association between those who expected an antibiotic prescription for a common cold and those who believed antibiotics were effective in treating coughs and colds ($p < 0.001$). Regarding attitudes, less than half of respondents (45.3%) had a positive attitude towards antibiotics. Approximately half of the responders (53%) would discontinue an antibiotic course once their symptoms improved. Meanwhile, antibiotics were shared by 48% of respondents with family members, and 55% would keep antibiotics at home for emergency usage. There was a strong association ($p < 0.001$) between the respondents who stop taking antibiotics when they feel better and those who believe "antibiotics are the same as drugs used to treat pain and fever."

Conclusion

The majority of the colleges' students have misconceptions, including believing that antibiotics are effective in treating the common cold despite being unaware of antibiotic efficacy and resistance. Additionally, many of the respondents also had negative attitudes concerning antibiotic use.

Introduction

Antibiotic resistance is a serious and growing problem, caused in part by the overuse and misuse of antibiotics (1). There is significant evidence of antibiotic misuse in the community. This includes prescription and use for inappropriate conditions, as well as the use of inadequate treatment courses and sub therapeutic doses (2). Antibiotics can be obtained without a prescription from a healthcare professional in Iraq. As a result, patients' understandings of antibiotics are crucial, as are the decisions they make based on those understandings.

According to the research of Butler *et al.* (1998), prescribers are influenced by a desire to preserve or build favorable relationships with their patients, and they prescribe based on their assessments of patient expectations (3). Patient misunderstandings can potentially result in the improper usage of antibiotics, such as using short courses and sub-therapeutic doses (4).

Misuse of antibiotics can lead to a number of issues, some of which include therapeutic failure, increased patient expense, an unnecessary increase in the incidence of adverse drug reactions, and the development of acquired multidrug resistance (5, 6) resulting in resource waste and significant economic loss, with developing countries being more affected as a result of existing poverty (7, 8).

According to a study by Fakeye *et al.* (2013), the level of education of those involved does not influence antibiotic misuse or the quality of healthcare provided in the country (9). Healthcare professionals are not free from the practice of prescribing antibiotics for viral diseases such as colds, upper respiratory infections, or non-infectious diarrhea (9). Additionally, the implementation of regulations governing the sale, use, and distribution of antibiotics and other prescription drugs remains inadequate or nonexistent in Iraq. As a result, the populace is at greater risk of irrational use of drugs, including antibiotics.

Previous research has shown that university students are involved in the misuse and abuse of various drugs. (10, 11). As a result, the goal of this study was to assess the knowledge and attitudes of non-medical students at a university about antibiotic use in Iraq.

Methods

Antibiotic resistance is a serious and growing problem, caused in part by the overuse and misuse of antibiotics (1). There is significant evidence of antibiotic misuse in the community. This includes prescriptions and use for inappropriate conditions, as well as the use of a cross-sectional questionnaire survey conducted from October to December 2022 was employed to collect public responses. Previous research [8, 12] was used to adapt and modify a two-part questionnaire. In this study, non-medical students took undergraduate courses in the faculties of arts, humanities, education, technology, basic sciences, agriculture, law, and social sciences. Students from the faculties of biology, veterinary medicine, and medicine were not included.

At the time of the study, there were 13340 undergraduate students enrolled across all faculties at Wasit University. Using the Raosoft sample size calculator (13), a sample size of 374 was obtained with a 5% margin of error and a 95% confidence level. This was rounded up to 400 and has been used as a guideline to enroll eligible students. The questionnaire was divided into two parts. Part I was made up of 12 knowledge statements covering five aspects, including identification of antibiotics, action of antibiotics, good bacteria (normal flora), adverse effects of antibiotics, and administration of antibiotics. Part II contained eight attitude statements. Participants were asked to respond with either "yes," "no," or "not sure."

All questionnaires were given to respondents face-to-face. Interviewers read out the questions and possible answers. All data was coded, inputted, and analyzed in Microsoft Excel 2013. One point was given for each correct answer, and zero for incorrect answers and "not sure," with a maximum possible correct score of 12. Respondents with a score of 9–12 were considered to

have strong knowledge; those with a score of 6–9 were considered to have moderate knowledge; and those with a score of less than 6 were considered to have low knowledge. For the attitude domain, the maximum score was 8, and the result was divided into two categories: "positive" and "negative".

Results

According to the current study, 71.75 % of respondents had low awareness about antibiotic usage, 6.5 % had strong knowledge, and the remainder (26.4 %) had moderate knowledge about antibiotic use (Table 1).

Table 1- Respondent Knowledge Level Regarding Antibiotic Use

Knowledge Level	Number	Percentage (%)
Good	26	6.5
Moderate	87	21.75
Poor	287	71.75
Total	400	100

The knowledge score varied from 0 to 12 points, with a mean of 4.68 2.16. The statements on the role of antibiotics and good bacteria received the highest inappropriate response (Table 2). The majority of respondents were unaware that antibiotics are ineffective against viral infections (88%), as well as the majority of coughs and colds (85%). In contrast, 73% of respondents appeared to be aware that antibiotics can cause allergic reactions, whereas 48% were unaware that antibiotics can cause side effects.

The statement "When your symptoms improve, you can stop taking your antibiotics" was strongly associated with the statements "Antibiotics are the same as drugs used to treat pain and fever, such as aspirin and paracetamol (Panadol)." ($p < 0.001$)

Table 2- The percentage of incorrect response to knowledge statements

	No	Statement	(%) N=400
Antibiotics' Role	1	Antibiotics are medications that can destroy bacteria.	41
	2	Virus infections can be treated with antibiotics.	88
	3	Most colds and coughs can be treated with antibiotics.	85
Bacteria that are beneficial	4	Antibiotics have the ability to kill bacteria that naturally exist on the skin and digestion tract.	70
	5	Bacteria that naturally exist on your skin and in the gut are beneficial to your health. .	85
Antibiotic Identification	6	Antibiotics are the same as drugs used to treat pain and fever, such as aspirin and paracetamol (Panadol).	44
	7	Penicillin is a kind of antibiotic.	55
Adverse Effects	8	Antibiotics may cause allergic reactions	27
	9	Antibiotics have no adverse effects.	62
	10	Antibiotics that are overused may lose their efficacy over time.	58
Antibiotic Administration	11	When your symptoms improve, you can stop taking your Antibiotics.	53
	12	Taking fewer antibiotics than prescribed is better for your health than taking the entire course.	47

Regarding the attitude of respondents towards antibiotic use a total of 236 respondents gave the correct answer in the knowledge section (part 1). Respondents were generally found to have (45.3%) positive attitudes toward antibiotics (Table 3).

Table 3- Attitude of Respondent Regarding Antibiotic Use

Knowledge Level	Number	Percentage (%)
Positive	107	45.3
Negative	129	54.7
Total	236	100
Total	200	100

The attitude score varied from 0 to 8 points., with a mean score of 3.91 ± 1.89 . Table (4) summarizes the percentage of incorrect responses for the eight attitude statements.

Approximately half of the responders (53%) would discontinue an antibiotic course once their symptoms improved. Meanwhile, Antibiotics were shared by 48% of respondents with family members, and 55% would keep antibiotics at home for emergency usage. A smaller proportion of responders used antibiotics with little caution. . In particular, 21 percent did not check expiry dates, and 13 % did not take antibiotics according to medical professional recommendations. There was a strong association between those who expected an antibiotic prescription for a common cold and those who believed antibiotics were effective in treating coughs and colds ($p < 0.001$).

Table4 -The percentage of incorrect response to attitude statements

No	Statement	(%) N=400
1	I take antibiotics to speed up my recovery when I get a cold.	82
2	If I get symptoms of a common cold I expect my doctor will prescribe antibiotic	86
3	When I start feeling better, I usually stop taking an antibiotic.	65
4	If a member of my family becomes ill, I usually give them my antibiotic.	48
5	I usually keep antibiotics on hand at home in case of an emergency.	55
6	I'll take any remaining antibiotics to treat a respiratory infection (runny nose, sore throat, flu).	32
7	I will take the antibiotic according to medical professional instruction	13
8	Before taking an antibiotic, I usually check the expiry date	15

Discussion

The current study identified numerous gaps in knowledge regarding antibiotics. Participants in 71.75% have poor knowledge. These results were consistent with those reported in Jordan by Shehadeh et al. [14], who estimated that 47.3% of participants correctly answered less than 50% of the knowledge questions. The mean total knowledge score in the current study, 4.68 2.16, and the median, 5 out of 12, are closely related to those in the Malaysian study by Lim et al. [15], which estimated that the mean participant score was 6.07 2.52 and the median was 6 out of 12. Additionally, Awad et al. [16] found that respondents in Kuwait had a median knowledge score of 7 out of 13.

The current study revealed that 88% of respondents said that antibiotics can kill viruses, compared to 85% of respondents who said they can treat coughs and colds, which indicated a lack of understanding regarding how to use antibiotics. These results were in line with those of a South Korean study (17), in which 69.9% of participants agreed with the statement that "antibiotics can work on most coughs and colds" and 69.4% said that they could kill viruses. However, a study from Jordan found that only 28.1% of participants stated that they had used antibiotics to treat viral infections (18). Many people, according to Shehadeh et al. [15], do not understand how to differentiate between bacteria and viruses and think that antibiotics are effective against both, which leads to unnecessary use.

Nearly 53% of participants disagreed that using antibiotics improperly reduces their effectiveness. (Stop taking antibiotics when symptoms improve); and roughly 58% disagreed that overuse of antibiotics decreases their efficacy. (i.e., antibiotics that are overused may lose their efficacy over time.) These false assumptions will result in increased, indiscriminate antibiotic use and the emergence and spread of bacterial strains that are resistant to antibiotics [19]. According to Arepyeva et al. [20], the amount of antibiotic use significantly affects the degree of resistance in some antibiotic-microorganism pairs. Moreover, the consumption of antibiotics and the prevalence of antibiotic resistance are shown to be causally related, according to Steinke and Davey [21].

The high significant association ($p = 0.001$) between the statements "Antibiotics are the same as drugs used to treat pain and fever, such as aspirin and paracetamol (Panadol)" and "When your symptoms improve, you can stop taking your antibiotics." suggests that the knowledge gap might not be completely random. According to Lim et al. [16], people might believe that antibiotics are the same as NSAIDs or painkillers, leading them to believe that it is okay to stop taking them once they feel better, just like they would with painkillers and NSAIDs. This suggests that the knowledge gap might not be completely random.

Regarding attitudes toward antibiotics, the current study's overall attitude score had a median of 4 out of 8 and a mean of 3.91 1.89. More than half (54.7%) of the sample can be considered to have a negative attitude, with an individual attitude score of less than 4. In comparison with the current study, Awad et al. [14] found that the overall attitude score was 4 out of 7 and Lim et al. [16] recorded an average score of 5.59 1.67 with a median score of 6 out of 8.

The highest negative response (86%) was found in the statement "I take antibiotics to speed up my recovery when I get a cold," followed by the statement "If I get symptoms of a common cold, I expect my doctor will prescribe antibiotics," in agreement with findings from other studies, including one from Jordan where 81.5% of participants said that the flu or cold is their main reason for using antibiotics (18) and one from Malaysia where 67.2% of respondents said that antibiotics can be used to treat viral infection (22). One cause of this misunderstanding is the irrational prescription of antibiotics for viral and mostly self-limiting upper respiratory tract infections (URTIs). As a result, the general public believes that antibiotics are useful in treating these conditions. As a result, patients who exhibit symptoms of the common cold would have great expectations for receiving an antibiotic prescription [23].

On the other hand, compared to the community of Riyadh, Saudi Arabia, where 31.1% of respondents use antibiotics to treat the common cold [26], the current results are significantly higher. In the same direction, it was discovered that the percentage was higher than the national averages for Malaysia (38%), South Africa (42%), and the US (27%) [29, 28–27].

A high negative response (48%) was found in the statement, "If a member of my family becomes ill, I usually give them my antibiotic". This percentage is significantly higher than that of studies conducted in Singapore (6.8%) (24) and the Philippines (37%).

The negative response to the statement "I usually keep antibiotics on hand at home in case of an emergency" was 55%. Likewise, 48% of respondents stated, "If a member of my family becomes ill, I usually give them my antibiotic". These negative attitudes may be the result of improper antibiotic prescriptions from medical professionals. According to a study by Arepyeva et al. (20), approximately 50% of antibiotic prescriptions written in primary care settings are "inappropriate," and approximately 75% of all antibiotic prescriptions are written for common conditions like respiratory illnesses. Furthermore, about 65% of respondents stop taking antibiotics once they begin to feel better, and as a consequence, a similar percentage keep them in stock at home for use in an emergency. Comparable results were found in the systemic review study, where 47.1% of participants stopped taking antibiotics once their symptoms improved [23].

The socioeconomic characteristics of the countries, including the health care programs and their role in educating and enhancing community health status, may be the cause of the differences in knowledge, attitudes, and behaviors regarding antibiotics.

Limitations

This study has a number of limitations. Like all public surveys, the accuracy of the findings was greatly influenced by the respondents' honesty and understanding. Convenience sampling may lead to selection bias. Because the research was done at a local university, its findings may not apply to the entire country.

Conclusions and recommendations

The majority of the colleges' students have misconceptions, including believing that antibiotics are effective in treating the common cold despite being unaware of antibiotic efficacy and resistance. Many also have negative attitudes concerning antibiotic use.

The students' involvement in various acts of antibiotic misuse and non-adherence practices highlights the critical need for increased health education and antibiotic awareness campaigns among university students in general on reasonable antibiotic usage and the consequences of irrational use. This may be accomplished by integrating health-related topics focusing on prudent use of antibiotics into the general courses, which are obligatory for all students and provide students with general information outside of their field of study.

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