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Research Article

Knowledge, Attitude and Practice toward the Use of Antibiotics without Prescription in Jeddah, Saudi Arabia: A Cross-sectional Study

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Abstract

Background and Objective: Antibiotics are widely used over-the-counter drugs, although they should be prescription-only medications. This practice represents a significant issue in bacterial resistance. This study was conducted to evaluate the knowledge, attitude and practice on self-medication antibiotics among Jeddah population. **Materials and Methods:** This was a cross-sectional study that use web-based questionnaires, given from September, 2012 to June, 2013. Among a total of 345 participants, 69% were 20-29 years old; the majority (72.5%) were women; 87.8% were Saudi; 73.6% were university-educated and 53.3% were students. **Results:** Around half of the subjects (54.5%) knew that improper antibiotics use lead to bacterial resistance. Their responses about the medical reason for which they used antibiotic were bacterial infections in 38.3%, viral infections in 12.8% and both in 23.5%. Despite the fact that half of the participants used antibiotics without a prescription, the majority of them (74%) agreed that the antibiotics must be taken until the end of the treatment course. Half of the participants had a habit of reusing leftover antibiotics. **Conclusion:** The implementation of a health education program is necessary to enhance public knowledge, attitude and practice on antibiotic use. Strategies that control the sale of antibiotics without prescription need to be implemented to guarantee its rational use.

Key words: Leftover antibiotics, viral infections, "knowledge, attitude and practice", self-medication

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Misuse of antibiotics is a significant global issue that has a deleterious impact on health; exposure to inappropriate or unnecessary antibiotics, as well as improper dose or/and duration of treatment, increase the possibility of antimicrobial resistance¹⁻⁴. Moreover, failure to finish the course of therapy or missing of doses can result in suboptimal treatment, which does not eradicate bacteria, thereby promoting antibiotic resistance⁵. The issue of bacterial resistance to antimicrobial agents has increased all over the world and is causing a public health problem that threatens patient care against infections⁶⁻⁸. Two recently conducted studies reported an increased pattern of bacterial resistance in Saudi Arabia⁹, particularly in Jeddah¹⁰. Several studies worldwide have indicated that one significant cause of this problem is the ability of the public to purchase antibiotics without prescription¹¹⁻¹².

In developed countries, antibiotics are not dispensed without a prescription from a physician or a health professional¹³. In developing countries, acquired bacterial resistance occurs probably due to the use of cheap broad spectrum antibiotics as first-line therapy. This malpractice may be related to the behavior of patients in acquiring medications without a prescription¹⁴⁻¹⁷. This behavior is common in Saudi Arabia¹⁸⁻¹⁹. Previous studies have evaluated the knowledge and attitude toward self-medication with antibiotics among the Gulf Cooperation Council population, including Oman²⁰, Kuwait²¹ and different parts of Saudi Arabia²²⁻²⁴. However, no such study has yet been conducted in Jeddah city. Therefore, the aim of the present study was to assess the patients' knowledge and attitude toward self-medication with antibiotics among the population in Jeddah, Saudi Arabia.

MATERIALS AND METHODS

A quantitative descriptive, cross-sectional study was conducted in Jeddah, Saudi Arabia to assess the public knowledge, attitude and practice on self-medication with antibiotics. Data were collected from September, 2012 to June, 2013 through web-based, self-administered questionnaires. The purpose of the study was explained at the beginning of the survey and it was clearly stated that completion of the questionnaire was taken as consent to participate in the study. Participants were assured of confidentiality and were not paid in any way. A total of 431 questionnaires were collected.

The questionnaire was adapted from similar previous studies²⁴⁻²⁷ and were reviewed by two pharmacologists. Thereafter, the questionnaire was translated by a bilingual

expert and the Arabic and English versions were approved by the ethics committee of King Abdul-Aziz University Hospital. The questionnaire contained 17 items in 4 sections. First was the sociodemographic component, which included gender, age, nationality, marital status, educational level, occupation, income and health insurance. Second was the knowledge component, which included the reasons for antibiotic use (fever, cough, flu, sore throat, gastroenteritis and others); adverse effects of the antibiotics (antibiotic resistance, allergy, rash, difficulty in breathing and none) and knowledge on the type of infecting micro-organism for which antibiotics are an effective treatment (bacterial, viral, both or not known). Third was the attitudes component, which included the source of the antibiotics (prescription from the physician, pharmacist or advice from others) and the cause for antibiotic intake without prescription (full doctor's appointment, participant had adequate information about the drug, time constraint, lack of transportation or symptoms that did not require doctor consultation). Fourth was the practice component, which included the time they stopped taking the antibiotics (at the end of symptoms, at the end of treatment period, at the end of the drug or if the symptoms were not relieved); the most common self-medicated antibiotics (Augmentin, Amoxil, Zithromax, Fucidin or not known); their habits of reading the product information and reuse of leftover antibiotics.

Statistical analysis: The data collected were analyzed using the IBM Statistical Package of Social Science (SPSS) software (version 20.0). Data were presented as frequency and percentage for each answer.

RESULTS

Sociodemographic data: The response rate after removal of incomplete questionnaires was (80%). A total of 345 questionnaires were completely answered. As shown in Table 1, 69% of the participants were 20-29 years old; most of the subjects (72.5%) were women; 87.8% were Saudi; 62% were unmarried and 38% were married; most (73.6%) were university-educated and 22% completed their secondary school. About half (53.3%) the subjects were students and 24.7% were employees. The income of the participants was between 5000 and 10000 Saudi riyals in 34.5%. More than half (60.3%) of the participants had medical insurance.

Knowledge about the use of antibiotics: The Table 2 showed the frequency and percentage of the participants' knowledge concerning the indications and side effects of the antibiotics.

Table 1: Demographic data of the study participants (n = 345)

Characteristics	Frequency (n)	Percentage
Age		
16-19	28	8.0
20-29	238	69.0
30-39	41	12.0
40-49	31	9.0
≥50	7	2.0
Gender		
Male	95	27.50
Female	250	72.50
Nationality		
Saudi	303	87.80
Non-Saudi	42	12.20
Marital status		
Unmarried	214	62.0
Married	131	38.0
Education level		
Uneducated	0	0
Primary	3	1.0
Intermediate	12	3.50
Secondary	76	22.00
University	254	73.60
Occupation		
Student	184	53.30
Employee	85	24.70
Unemployed	76	22.00
Average monthly income		
<3000	35	10.00
3000-5000	90	26.00
5000-10000	119	34.50
More than 10000	102	29.50
Medical insurance		
Yes	208	60.30
No	137	39.70

Table 2: Participants' knowledge regarding the use of antibiotics (n = 345)

Characteristics	Frequency (n)	Percentage
Reasons for antibiotics use		
Fever	69	20.00
Cough	41	12.00
Flu	90	26.00
Sore throat	135	39.00
Gastroenteritis	7	2.00
Others	3	1.00
Adverse effects of antibiotics		
Antibiotic resistance	188	54.50
Allergy	98	29.00
Rash	38	11.00
Difficulty in breathing	3	1.00
No side effects	17	5.00
Type of infections for which antibiotics were effective		
Bacterial infections	132	38.30
Viral infections	44	12.80
Both	81	23.50
I do not know	88	25.50

When the participants were asked about what they knew about the medical uses of antibiotics, 39 and 26% responded that antibiotics are effective for sore throat and flu,

Table 3: Participants' attitude regarding the use of antibiotics (n = 345)

Characteristics	Frequency (n)	Percentage
Source of antibiotics		
Prescription from the physician	147	42.50
Pharmacist	72	21.00
Previous experience	98	29.00
Advice from others	28	8.00
Reason of self-medication		
Full doctor's appointment	79	23.00
Participant had adequate information about the drug	121	35.00
Lack of transportation	17	5.00
Symptoms did not require doctor consultation	128	37.00

Table 4: Participants' practice regarding the use of antibiotics (n = 345)

Characteristics	Frequency (n)	Percentage
When the antibiotics were stopped		
At the end of symptoms	64	18.50
At the end of treatment period	255	74
At the end of the drug	26	7.50
Most common self-medicated antibiotics		
Augmentin	99	28.70
Amoxil	80	23.20
Zithromax	42	12.20
Fucidin	10	2.90
Not known	114	33
Reuse of leftover antibiotics		
Yes	165	47.80
No	180	52.20
Have read the product information before antibiotic use		
Yes	276	79.70
No	69	20.30

respectively. Surprisingly, around half (54.5%) of the subjects knew that antibiotics could lead to bacterial resistance and about one-third of them (29%) knew that allergy could be a side effect of antibiotics. Only 5% of the participants reported that antibiotics have no side effects. When they were asked about the type of infections that antibiotics treat, only 38.3% reported bacterial infection; the remainder incorrectly answered either viral, both viral and bacterial or did not know.

Attitude toward the use of antibiotics: The participants were asked about their attitudes toward self-medication with antibiotics and their answers were summarized in Table 3; 42% of the participants used antibiotics based on physicians' prescription but one-third of them used antibiotics based on previous experience. When asked about the reason for which they received antibiotics without prescription, 37% responded that their symptoms did not require a doctor consultation and 35% replied that they had adequate information about the drug.

Practice regarding the use of antibiotics: As shown in Table 4, assessment of the practice toward the use of

antibiotics showed that three-fourths of the participants completed the antibiotic treatment course; however, 18.5% of them admitted to stop antibiotic intake when they felt well. The most common self-medicated antibiotic among our population was Augmentin in 28.7%. However, one-third of the participants did not recall the type of antibiotic that they usually used. Almost half of the participants reused leftover antibiotics for subsequent infections and majority of them had the habit of reading the product information.

DISCUSSION

The present study assessed the knowledge, attitude and practice regarding the use of antibiotics without prescription among a population in Jeddah. Current results revealed poor knowledge regarding the indications, a false attitude toward and bad medical practice of antibiotic use. The results of this study could be utilized to create public educational programs on antibiotics and to implement a stricter policy on public access to antibiotics. Other researchers have identified some keys factors that played a role in the spread of antibiotic resistance in the community^{12,15,25,28}. These factors included self-medication of publicly acquired antibiotics without prescription; unnecessary use of antibiotics, such as intake for viral illness; incomplete course of treatment and reuse of leftover antibiotics. It was considered these factors relevant and investigated them further in this paper.

In the current study, the participants were less knowledgeable on the indications and type of infection that should be treated with antibiotics. Indeed, the majority of the participants believed that antibiotics are used to treat sore throat, flu and fever. Other studies done in other Arabic populations reported the same results^{21,27}. In the same context, the participants in current study and in the other Arab studies^{21,27} expressed confusion with regard to the antibiotic spectrum against bacterial and viral infections. In contrast, participants from European studies were shown to be more knowledgeable on this aspect^{25,26}. Notably, compared with the study participants in the Riyadh region²⁴, the participants in the current study showed better knowledge with regard to antibiotic side effects, particularly on the concept of bacterial resistance. This discrepancy could be accounted for, in part, by the fact that the participants in the current study were younger, had higher education status and had better access to health information through social media. In contrast, the participants in the Riyadh study were hospital-based populations.

In the present study, more than the half of the participants self-medicated with antibiotics without

prescription based on their previous experience and advise by others, including pharmacists; this percentage was in agreement with the results of a study done in Jourdan (51.8%)²⁷. A disturbing fact that was revealed by the former study but not was not assessed in this present study was that 50% of physicians treated common colds with antibiotics and 22.9% of physicians prescribed antibiotics through the phone²⁷. This practice of antibiotic prescription among physicians in Jeddah could be addressed in a future study.

In the present study, three-fourths of the participants had the habit of completing the course of the antibiotics, as prescribed; this percentage was higher than the one reported by a recent study on a Kuwaiti population²¹ but was similar to the results of a study done on a Riyadh population²⁴. The discrepancy of the results between the current study and the study on a Kuwaiti population could be partly related to differences in the methodology. Unlike the public survey done in Kuwait, this study in Jeddah used a web-based survey, which possibly added sampling bias, albeit unintentional, in recruiting younger and more highly educated participants who were more familiar with technology. Notably, the most common self-medicated antibiotic in our population was Augmentin, which was in agreement with the study on a Riyadh population²⁴. This observation rise be health concerns in Saudi Arabia, because Augmentin is a broad spectrum antibiotic. The present study showed that half of the participants had a habit of reusing leftover antibiotics. This percentage was relatively higher than that reported in Kuwait, which reflects the success of a recently conducted educational campaign²¹.

Considering the different results obtained by this study and the abovementioned studies, it stipulated that the varying culture and legislation on antibiotic use among countries may influence the irrational use of this medication without a prescription and contribute to further development of antimicrobial resistance. This hypothesis has been examined by various studies^{8,24,29}, which concluded that stricter legislation could reduce improper use of antibiotics.

Despite the importance of this study in assessing and improving the knowledge, attitude and practice of antibiotic use in a Jeddah population, there were some limitations that were mainly related to the methodology. One was the risk for recall bias during completion of the self-administered questionnaire. Another limitation was the selection bias, which was possibly introduced in this web-based survey. Although a web-based survey has many advantages, such as speed, broader coverage of subjects in different regions and convenience, the web-based design could have biased the selection of participants toward including younger and more highly educated subjects.

CONCLUSION AND RECOMMENDATIONS

The present results showed unsatisfactory knowledge and attitude regarding the use of antibiotics in Jeddah population. Therefore, public educational programs in Jeddah are needed to increase knowledge and change the practice of antibiotic use. It is also recommended that stricter national policies on antibiotic prescriptions be implemented to control the extent to which the public can access these medications and limit self-medication. Importantly, the misuse of antibiotics could be due to inadequate patient education by physicians. Therefore, an awareness program is needed to encourage physicians and pharmacists to better communicate with patients and educate them on the proper and safe use of antibiotics.

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