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Self-Medication Towards Antibiotic Use Among Non- Medical University Staff (Conference Paper)#

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Abstract

The use of antibiotics without prescription (self-medication) is growing globally and is associated with increased bacterial resistance, ineffective treatment and adverse reactions. This study aimed at assessing the practice of antibiotic self-medication in the Iraqi population. A cross-sectional study design was adopted in this work. The sample was comprised of 303 staff members from the non-medical colleges in Iraq. An online questionnaire was distributed between the 29th of June to the 14th of September 2021 to collect data including socio-demographic characteristics and questions about antibiotic self-medication. Most of the participants had a university degree and a moderate monthly income. The majority (88%) have practiced self-medication at least once before. A "simple" condition and convenience were the main motivators behind self-medication, which was mainly used for sore throat, fever and cough. Own experience was the most reported determining factor for selecting an antibiotic, and community pharmacies were the main source for obtaining the antibiotics. About 40% of the participants admitted to switching the antibiotic or changing its dose during the treatment course. Self-medication with antibiotics is a major issue in our community and measures have to be taken to reduce its impact on public health through the development of bacterial resistance.

Keywords: Self-medication, Antibiotics, Bacterial resistance.

التطبيب الذاتي باستخدام المضادات الحيوية بين أعضاء هيئة التدريس في الكليات غير الطبية

(بحث مؤتمر)#

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الخلاصة

إن استخدام المضادات الحيوية بدون وصفة طبية (التطبيب الذاتي) يزداد عالميًا ويرتبط ذلك بزيادة المقاومة البكتيرية لها، والعلاج الغير الفعال والتفاعلات الضارة. تهدف هذه الدراسة إلى تقييم مشكلة التداوي الذاتي بالمضادات الحيوية لدى سكان العراق. تم اعتماد دراسة مقطعية في هذا العمل, حيث تكونت العينة من ٣٠٣ منتسب في الكليات غير الطبية داخل العراق. وقد تم توزيع الاستبيان عبر الإنترنت بين ٢٩ يونيو و ١٤ سبتمبر ٢٠٢١ لجمع البيانات بما في ذلك الخصائص الاجتماعية العامة وأسئلة حول التطبيب الذاتي بالمضادات الحيوية. كان معظم المشاركين حاصلين على شهادة جامعية ودخل شهري معتدل. الغالبية الكبرى (٨٨٪) مارسوا التطبيب الذاتي على الاقل مرة واحدة من قبل. الحالة كانت "بسيطة" وسهولة الحصول على المضادات الحيوية هي الدوافع الرئيسية وراء التطبيب الذاتي ، حيث كان يستخدم بشكل أساسي في التهاب الحلق والحمى والسعال. الخبرة الشخصية كانت هي العامل الأكثر شيوعًا لاختيار المضادات الحيوية ، وكانت الصيدليات المجتمعية هي المصدر الرئيسي للحصول على المضادات الحيوية. حوالي ٤٠٪ من المشاركين قد ذكروا انهم قاموا بتبديل المضاد الحيوي أو تغيير جرعته أثناء فترة العلاج. التطبيب الذاتي بالمضادات الحيوية هو قضية رئيسية في مجتمعنا ويجب اتخاذ التدابير اللازمة للحد من تأثيره على الصحة العامة من خلال تطوير المقاومة البكتيرية.

الكلمات المفتاحية: التطبيب الذاتي، المضادات الحيوية، المقاومة البكتيرية

Introduction

Self-care is any practice adopted by an individual for the purpose of maintaining own health and protecting from diseases, and one element of self-care is self-medication [(1)]. The World Health Organization (WHO) defines self-medication as "the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms" [(2)]. Self-medication is growing to be a major public health problem and cultural, political and economic factors have contributed to triggering a global increase in this practice [(3)]. Differences in the attributes of the health care systems between the developed world and the developing world such as t the access to care, guidelines of compensation and the policies for dispensing drugs result in varied prevalence of self-medication between these two worlds [(4)]. In the developing countries, infections continue to be a very common cause of death, and that is why antibiotics are very important therapies [(5)]. They are within the most commonly sold medications globally [(6)].

Self-medication with antibiotics may be viewed as irrationally using the antibiotics [(7)]. The consumption of antibiotics without a physician prescription has been mounting recently and has contributed significantly to antimicrobial resistance [(8)].

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Antibiotics resistance is becoming a global health catastrophe due to continuous overuse and misuse of antibiotics throughout the world, the main reason behind this disaster is attributed to self-medication [8][9]. This irrational use is also associated with various health hazards that could result from mistakes in the diagnosis, the dose, the route of administration or even the formulation. Risks of adverse effects and drug interactions can also contribute to the health hazards [10]. The extensive inappropriate use of antibiotics combined with unawareness of the individuals about the proper use of the antimicrobials, their adverse effects or correct doses are possible causes of misdiagnosis, antibiotic resistance increased morbidity [8].

For all these reasons, many countries have laws to prohibit selling antimicrobial drugs without prescription to avoid the evolution of super bacteria resistant to all known antimicrobials [11]. Unfortunately, this is not the case in all countries, where such drugs can be purchased relatively easy without prescription. A study conducted by Nusair *et al* in Jordan showed that the practice of antibiotics self-medication was still high in 2021 and this should urge the authorities to find an approach to limit antibiotics dispensing to prescriptions only [12]. Another recent study in Turkey revealed that self-medication with antibiotics continues to be a major health concern in the society that requires educational campaigns in order to warn about the consequences of inappropriate use of antibiotics [13]. In Iraq, laws do exist that prohibit over-the-counter sale of antibiotics, but they are not enforced, and it has been reported that these drugs can be purchased directly from the pharmacy [14].

Little is known about the self-medication of antibiotics among the staff of non-medical colleges in Iraqi universities, therefore; this study aims to shed light on this important topic in order to reduce the chance of fueling antimicrobial resistance in our society.

Material and Methods

A cross-sectional study design was used in this study by conducting a web-based survey among the staff of non-medical colleges in Iraqi universities (Baghdad and Mosul universities as model). The participants were recruited during the period from 29th of June to 14th of September 2021. A convenience sampling with snow-balling technique was used to invite the participants. The inclusion criteria were being a staff member in Baghdad or Mosul universities. The teaching staffs in medical colleges were excluded from this study.

The survey was conducted in Arabic language to be comprehensible and easily understood by the university staffs. The original English version was adapted from previously published works [15–17]. Face validation was conducted through an expert panel to ensure the cultural adaptation within the Arabic version. It was designed by Google Forms, and the survey link was sent three times to a variety of social media closed groups (like WhatsApp, Viber, and Messenger); at the beginning of the study on 29th of June, on 25th of July and on 11th of September. Settings of the Google Form survey were set to "Limit to 1 response" in order to ensure a one response being received from each participant without duplication.

The front page in the survey included information about the aims of the study, a confirmation that the participation was completely voluntary, and that all data would only be used for the research purpose. The first part of the survey was used to collect data about the socio-demographic characters of the participants (age, gender, university, residence, education, and monthly income). Part two consisted of questions about self-medication by using antibiotics; the first two questions asked the respondents whether they knew antibiotics and if they had used antibiotics previously. The remaining questions were regarding antibiotic self-medication asking about the frequency of the practice, the main driving force and complaint behind self-medicating, factors affecting the choice of the antibiotics, the source of the drugs, whether the instructions were being checked or not, the possibility of changing the antibiotic or its dose and the reasons behind stopping the treatment.

All the data were processed and analyzed by using Microsoft Excel 365 and Statistical Package for Social Sciences version 26 (IBM SPSS Statistics for Windows, IBM Corp., Armonk, NY, USA). Descriptive statistics (frequency and percentage) were used to describe demographic characters. Pie and clustered column charts were used to illustrate the responses of the participants.

Before conducting the study, the protocol of the work was authorized by the scientific committees in Baghdad College of Medical Sciences and the Department of Clinical Pharmacy at the College of Pharmacy / University of Mosul. The participants were asked to put a tick in the Google Form survey to confirm that their participation was voluntary and to inform them that their data would only be used for research purposes.

Results

A total of 303 participants were recruited in this study with age ranged between 19 and 70 years and the mean (SD) of the age was 41.47 (10.55) years. The other demographic characteristics of the study participants are illustrated in Table 1.

Table 1. Demographic characteristics of the study sample

Variable	N (%)
Gender	
Male	147 (48.5)
Female	156 (51.5)
University	
Mosul	141 (46.5)
Baghdad	162 (53.5)
Residence	
Urban	286 (94.4)
Rural	17 (5.6)
Education	
Secondary	49 (16.2)
University	113 (37.3)
Post graduated	141 (46.5)
Monthly Income	
Limited (< 500,000 IQD)	63 (20.8)
Moderate (500,000 – 1,000,000 IQD)	205 (67.7)
High (> 1,000,000 IQD)	35 (11.6)

Almost all participants (96%) declared that they knew a group of drugs called antibiotics, and about 95% of the studied population mentioned that they had used antibiotics in the last two months (Figure 1). Out of the 303 participants in this study, 265 (88%) said that they have practiced self-medication with antibiotics before. When they were asked about the frequency of self-medication with antibiotics in the past year, 133 (43.9%) participants said that they rarely self-medicated with these drugs compared to 29 (9.6%) and 24 (7.9%) who admitted to self-medication usually and always respectively.

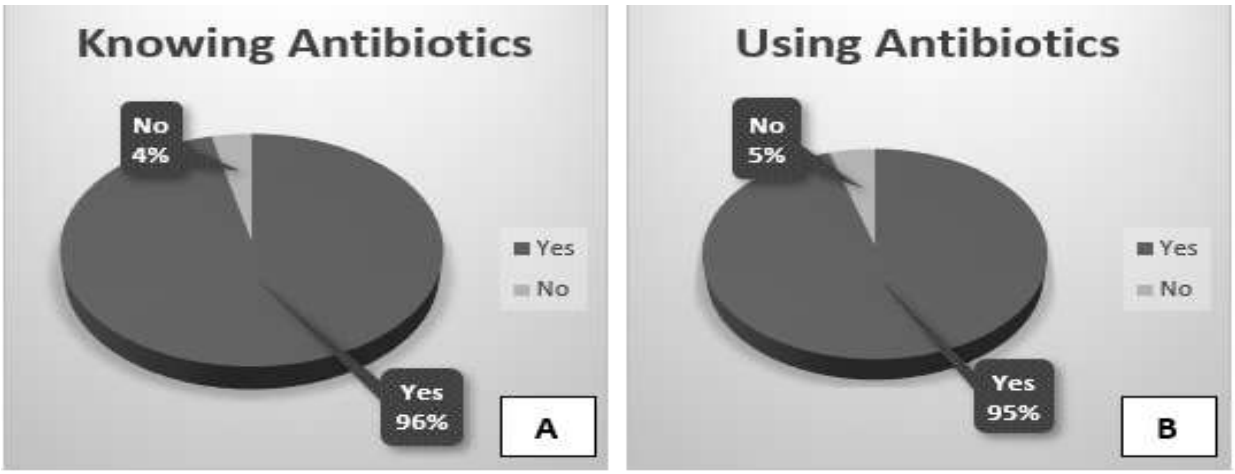

Figure 1. A. The of percentage participants having an antibiotics knowledge
B. The percentage of participants who have used antibiotics in the previous two months

Having a condition that was seen as simple by the participant was the main driving factor behind seeking self-medication with antibiotics. Figure 2 summarizes these factors.

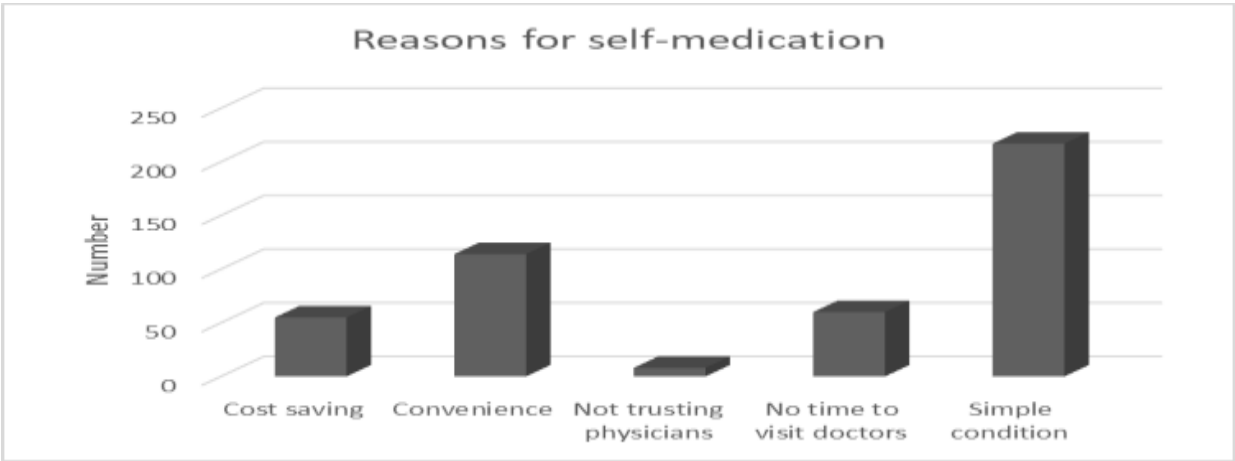

Figure 2. Reasons for self-medication with antibiotics

Regarding the complaint behind using antibiotics without prescription, sore throat came first, followed by fever and cough while skin wounds and vomiting came last (Figure 3A). Own experience was the major determining factor when choosing antibiotic for self-medication followed by recommendation from a pharmacist or having leftovers from a previous prescription (Figure 3B). When the participants were asked about the considerations behind selecting a particular antibiotic for self-medication, the majority chose the type, indications and the brand of the drug as their answers. Side effects and price were not very important (Figure 3C). Community pharmacies were by far the most important source for the antibiotics used by participants for self-medication. Other sources existed but were much less significant (Figure 3D).

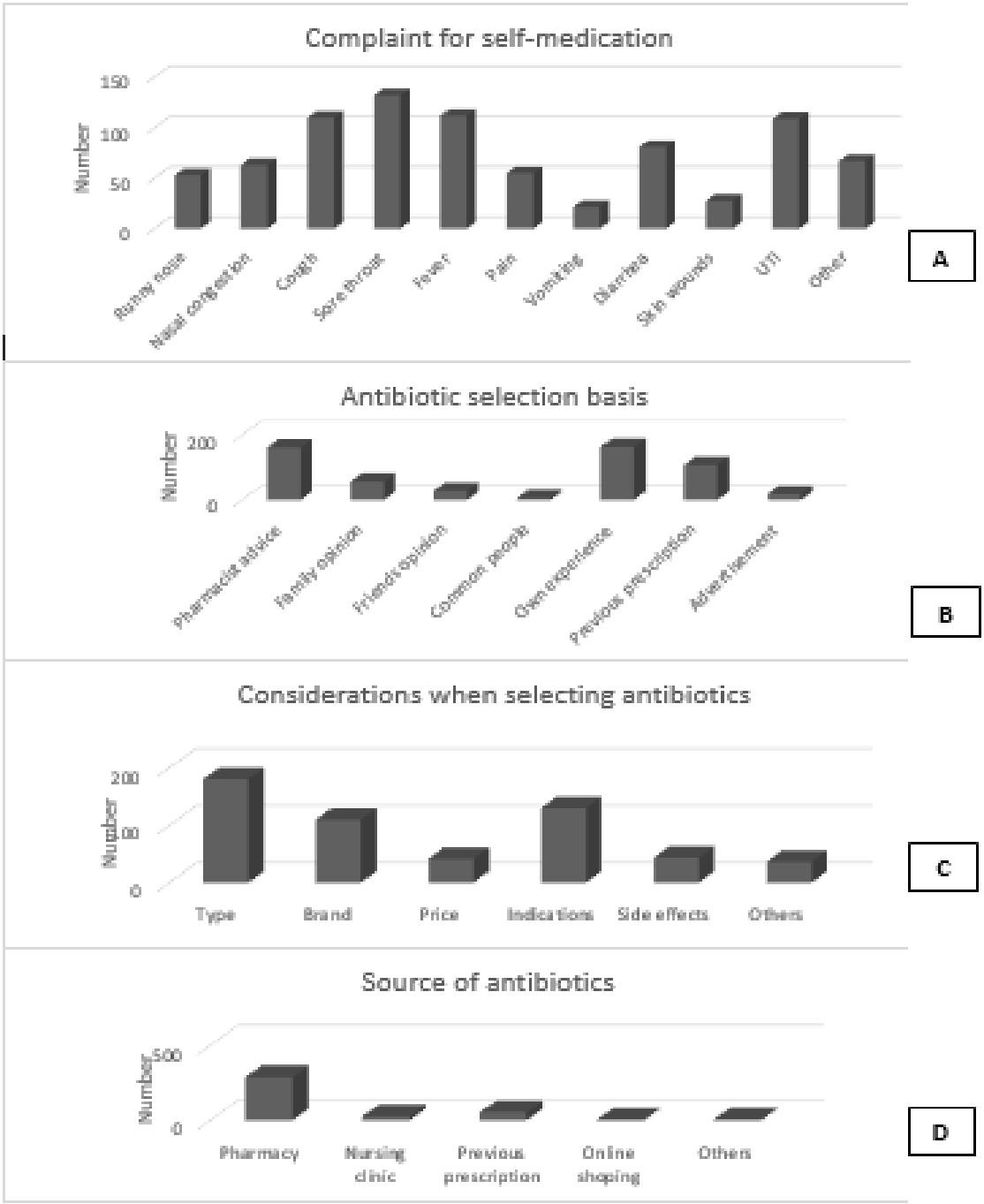

Figure 3. A. Complaint for self-medication with antibiotics
B. Antibiotic selection basis
C. Considerations when selecting antibiotics
D. Source of antibiotics

When asking the participants if they ever check the instruction of antibiotics, 160 (52.8%) mentioned that they always read it, while 92 (30.4%) answered they sometimes check it and only 51 (16.8%) said that they never do that. The pharmacist was the principal source of the information regarding the appropriate antibiotics' doses, followed by reading the leaflets and own experience. Doctors, family or friend and internet came after (Figure 4).

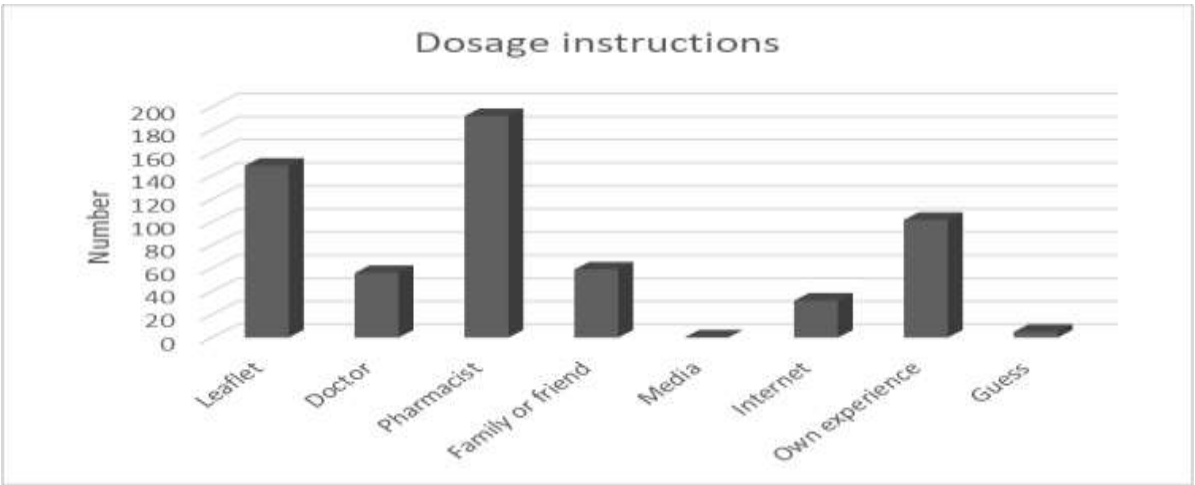

Figure 4. Source of dosage instructions.

During the course of treatment, approximately 60% of the participants admitted to never switching the antibiotic used while only 4% said that they always change their medication. Concerning the dose used in self-medication, about 40% of the non-medical staff said they sometimes change the dose deliberately, in contrast to 172 (56.8%) participants who assured they never change the dose by themselves. Improvement of the medical condition was a major reason behind changing the dose of the antibiotic whereas worsening of the condition was a minor one according to the respondents (Figure 5).

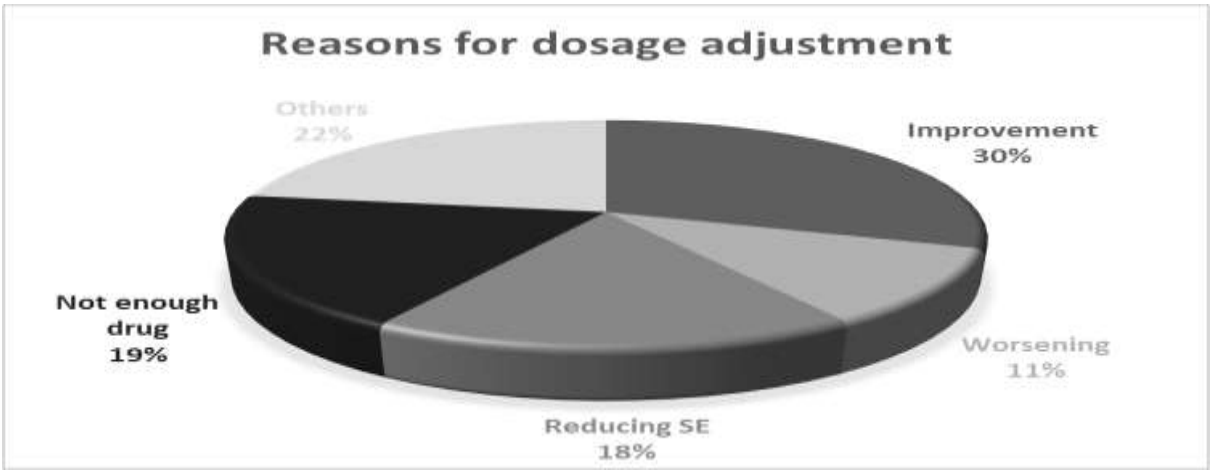

Figure 5. Reasons for dosage adjustment

Regarding concern about taking a counterfeit product, about one third of the respondents said that they are always very much concerned about this issue compared to one half who are never concerned about having a counterfeit antibiotic. The participants divided approximately equally into either keeping the same product brand or changing it throughout the treatment course. Figure 6 shows the responses of non-medical staff participants about the reasons for stopping treatment with the antibiotics; disappearance of symptoms and completing the course were the main reasons.

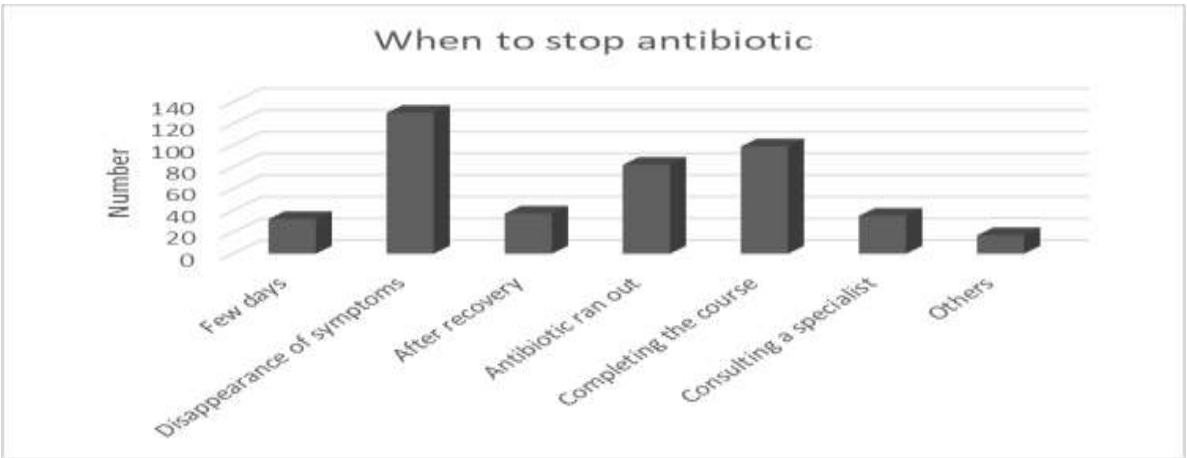

Figure 6. When to stop antibiotic

More than two-thirds of the participants (72.9%) have suffered from some type of adverse reaction to the antibiotics during usage. The main response when this happened was to stop the antibiotic followed equally by consulting a pharmacist or a family or friend. Doing nothing and switching to another antibiotic were also recorded by some participants (Figure 7).

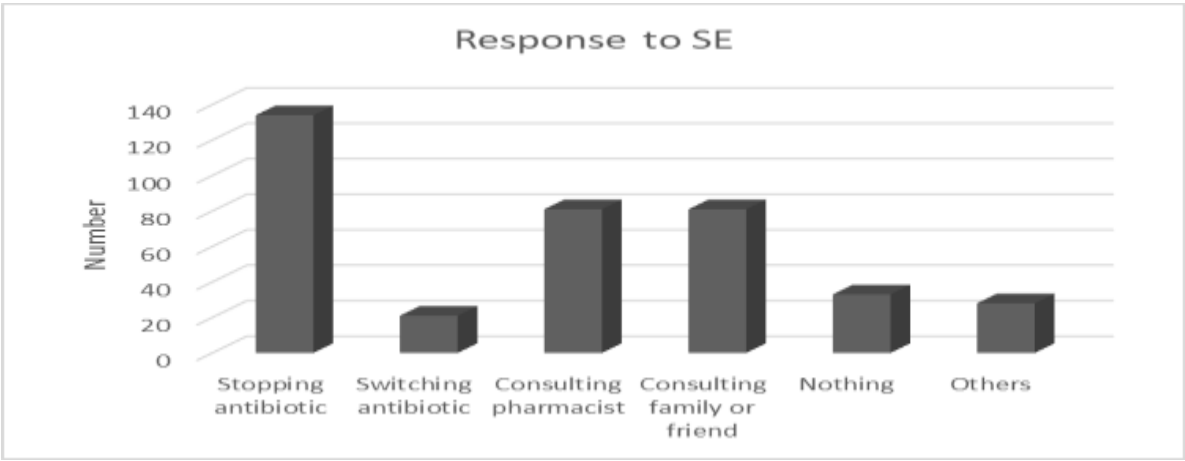

Figure 7. Response to side effects

More than half of the participants (58.4%) think that self-medication with antibiotics is an acceptable practice. The remaining participants were distributed between thinking that either it is a good (19.8%) or non-acceptable (21.8%) practice. At the same time, 114 (37.5%) respondents assured that self-medication cannot treat common infections and only 83 (27.4%) said that it may be able to treat these infections in contrast to 106 (35%) who were confident that they will benefit from self-medication.

Discussion

Self-medication with antibiotics reflects individuals' wish to take the responsibility of treating some health problems. There are many pros and cons associated with self-medication; reducing healthcare costs and the momentum on doctors to devote themselves for more urgent cases are among the advantages. On the other hand, inappropriate usage of antibiotics could lead to worsening of the condition as well as the development of antibiotic resistance [18–20].

The mean age of the respondents in the current study was 41.47 years which was similar to the age of participants in another study conducted in Sri Lanka [21]. But different from studies that were conducted in Bangladesh and India as the Bangladeshi and Indian participants were younger [22,23]. This is because the target population was different between the studies. More than three quarters of the participants in this study have graduated from universities (37.3% university educated and 46.5% post graduated), and this is comparable to the education of the participants in a Saudi study [24]. Ninety-six percent of the participants in the current study reported that they knew antibiotics as a drug group; this percentage was higher than that found by Ateshim *et al* [25] in Eretria.

The majority of the participants in this study (88%) have practiced self-medication with antibiotics, this is comparable with other studies that were conducted in Sudan [26] and India [27]. However, such percentage is much higher than results of other studies conducted worldwide [15,25,28–30]. This variation may be attributed to the presence of more rigorous laws governing the use of antibiotics or to

differences in economic characteristics in targeted populations. Forty-three percent of the participants in this study said they rarely used antibiotics last year, while in Eretria, a similar ratio of respondents self-medicated with antibiotics once or twice in the 12 months prior to the study by Ateshim *et al* [25].

Being sick with a simple condition was the main reason behind antibiotics self-medication in the current study. This agreed with the findings of Seam *et al* [22], Zawahir *et al* [21], and Ateshim *et al* [25], but was in contrast to the findings of a study conducted in Afghanistan as cost and lack of time came first [31]. The low income of the Afghani population could be blamed for having cost come first as a driving force for self-medication.

In our study, sore throat was the first indication for self-medicating with antibiotics and this was in agreement with the other studies [15,17,27,32–34]. There were studies, however, which disagreed with our results; in an Afghani study [31], cough was the main complaint for which antibiotics were used, in a Bangladeshi study [22] fever was the major reason behind antibiotics self-medications, in Eritrea [25] the antibiotics were mainly self-prescribed for skin wounds and in Sri Lanka [21], common cold and cough came first. Although the indications for antibiotic self-medication seem different between countries, simple upper respiratory tract problems appear in the majority of the studies [15,17,21,27,31–35]

Regarding the factors affecting choosing antibiotics, participants in this study stated that own experience was one of the main factors affecting their choices, this agreed with other studies [17,22]. The finding of this study concerning the basis of selecting a particular antibiotic were the type beside the indications which came in accordance with another study [31]. This may give a clue that the public are educating themselves about drugs by reading the leaflets or asking the pharmacist, but such education should not be regarded as a good practice if it leads to self-medication. When asking the respondents about the source for the antibiotics community pharmacies came as the major source in accordance with other studies [21,22,31,36–38]. A flaw in the laws governing the sale of antibiotics or defects in enforcing them is probably the reason why the public can obtain antibiotics from the pharmacy without a prescription.

Only 51 (16.8%) participants said that they never check the instructions of antibiotics before usage. The same percentage was recorded in Afghanistan as 45 (16%) participants admitted that they never read the package [31]. Leaflets are put there for a reason, to inform the patients of the uses, dosage and potential side effects of the drug [39] and ignoring them may increase the already existing risk of self-medication. When asking participants about the source of their information; the pharmacist was the main source in our study similar to another study [31], while previous experience came first in a study conducted in Jordan [15].

In this study, highest percent of the respondents (60%) assured that they never switch antibiotic they use and this is consistent with the findings of a Nepali and Indian studies [17,38]. About 57% of the participants in this study assured that they never deliberately change the dose of antibiotics by themselves, the respondents who changed the dose of antibiotics admitted that the improvement in clinical condition was the main cause to adjust dose without prescription. This ratio was comparable to that reported by Haque *et al* [11]. Switching antibiotics or changing their dosage during treatment without consulting a specialist add to the problems of self-medication such as mistreatment, bacterial resistance and adverse effects [40].

About half the study sample expressed no concern at all in buying counterfeit antibiotics. Although this practice may be attributed to the lower cost of such products, the actual cost may increase as the use of counterfeit drugs is associated with treatment failure and the development of resistance [41]

Disappearance of symptoms was the main reason why the respondents stopped self-medication with antibiotics in the current study followed by completing the course just like other studies [25,31,38]. However, this disagrees with the findings of Rajendran *et al* [17] who reported the completion of the course as the main reason. Although it is widely known that a course of antibiotics should be completed even after the cessation of symptoms to avoid the development of resistance, recent reports suggest that this practice is not supported by solid evidence [42].

In this study, about 73% of the participants said that they may have experienced some side effects due to the use of antibiotics. In contrast, Pant *et al* [38] found that about 80% of the participants did not express any side effects. For those who suffered from adverse reactions, the majority from the two studies stopped the antibiotics course when this happened.

Regarding the opinion of the participants in this study about the practice of self-medication, 58.4% of them considered self-medication as an acceptable practice, and this result was less than other studies [17,38]. The fact that the percentage in the current study was lower than other studies should not be used to lessen the negative impact of self-medication practice in our community. This is because the percentage is still too high (more than half of the population) and will increase to about 78% if the percentage of those believing that self-medication is a "good" practice was added.

More than one third of the participants were confident that antibiotic self-medication will treat common infections. This ratio agrees with the findings of Pant *et al* [38]. One third of the population should not be regarded as insignificant since these people can affect the opinion and practice of their

family members and friends, expanding the problems of self-medication.

Limitations of the Study

The current study had some limitations. The cross-sectional design of the study measures each variable only once as both exposure and outcome are assessed at the same time and any causal relationship will need further assessment. The use of an online tool may also be viewed as a limitation since it confined the questionnaire to close-ended questions and eliminated the interviewer who could obtain more realistic responses from the participants.

Conclusions

The findings of this study confirm that self-medication with antibiotics is widely spread in our community. Having a simple upper respiratory tract problem and convenience were the most important reasons behind practicing self-medication, and community pharmacies were the main source for obtaining the antibiotic without prescription. Therefore, more rigorous laws need to be enforced to govern the sale and usage of antibiotics to avoid the development of bacterial resistance.

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