



Self-Medication with Antibiotic among Public Population in Erbil City

**Rozhan Arif Muhammed^{1*}, Ahmed Habeeb Hattab Dala Ali Al-Ani^{2,3}
and Ali Omar Yassen¹**

¹Department of Pharmaceutical Science, Tishk Internatinal University, Erbil, Kurdistan Region, Iraq.

²School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Penang, Malaysia.

³College of Pharmacy, Almaarefa University, Riyadh, Saudi Arabia.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Self-medication is the administration of medications without a medical prescription to manage self-diagnosed health problems or symptoms. Self-medication with antibiotics is a global phenomenon, and it is more common in developing countries due to poor regulatory controls. The aim of this study was to evaluate the prevalence of self-medication with antibiotics in Erbil city, Iraq. This was an observational cross-sectional study involving a total of 100 people from the public population in Erbil City, Iraq. A self-administered questionnaire was used to collect data from the participants. Among 100 participants, 90% of them were self-medicated with antibiotics. Amoxicillin was the most commonly used antibiotic for self-medication. For successful treatment, 77% of the participants were satisfied by self-medication with the antibiotic. The primary source for the antibiotic was from a community pharmacy with 38%. The study showed that there is a significant association between self-medication with antibiotics and the occupational status of the participants. Self-medication with antibiotics was found to be prevalent among the public population of Erbil City. As a recommendation regulatory control should be implemented to prevent dispensing antibiotics without a medical prescription.

*Corresponding author: E-mail: rojan.arif@tiu.edu.iq;

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1. INTRODUCTION

Antibiotic is a medicine used to treat and manage infections caused by bacteria or any other microorganisms. It acts either by killing the organism or inhibiting its growth [1]. Self-medication is defined as "the use of drugs to treat self-diagnosed disorders or symptoms without prescription or continuation for the previously prescribed drug used for chronic or recurrent disease or symptoms or sharing with family or friend or using the leftover drug stored at home". In other words, self-medication is the act of obtaining and consumption of medications or drugs without a physician's prescription to treat specific signs and symptoms [2, 3].

Self-medication, i.e. overuse or misuse of antibiotics by the patients, is considered one of the risk factors contributing to antibiotic resistance which is defined as "bacteria not inhibited by the usually achievable systemic concentration of an agent with regular dosage schedule or fall in the minimum inhibitory concentration ranges" [4-6].

Despite many efforts done by WHO to eradicate antibiotic misuse worldwide, purchasing antibiotics without a prescription is one of the most global phenomena [7]. Studies have reported that selling antibiotics without prescription happened by 58% in Asia, 30% in Eastern Europe, 47% in southern Europe, 25% in South America, and 39% in the Middle East [8]. This will lead to a serious problem in public health because it will cause to increase in antibiotic resistance in the community. Furthermore, self-medication with antibiotics leads to unavoidable costs and undesirable side effects. [8]

The main issue with self-medication with antibiotics is drug resistance. In the United Kingdom (UK) in 2014, roughly 700,000 people were expected to die due to drug-resistant bacteria according to the UK government, it might rise to 10 million by 2050 [9].

Prescribing of the appropriate antibiotic is very crucial and it is associated with improved patients' health outcomes. Furthermore, it will reduce the development of bacterial resistance as a result of misuse or overuse of antibiotics. In developing countries, the prevalence of antibiotic resistance expanding daily. Health care providers

are facing a major issue in the treatment of infectious diseases as antimicrobial treatment becomes less effective against various different microorganisms are involved in antibiotic resistance and the available agents that can be used to overcome these new infections are limited. In addition, it is important to note the major issue related to the inability/failure to develop new antibiotic agents that can be used to treat/overcome these new resistant bacteria [10, 11]. Therefore, this study aimed to describe the self-medication with antibiotics among the general population in Erbil city, Iraq to understand the factors that can be associated with self-medication with antibiotics.

2. MATERIALS AND METHODS

2.1 Study Design and Population

This was a cross-sectional study carried out "between" 1st October to 30th December 2020 in Erbil city, Northern Iraq. A self-administered questionnaire was distributed to 120 individuals living in Erbil city. The primary objective of this study was to investigate the prevalence of self-medication among the public population living in Erbil city.

2.2 Survey Instrument and Data Analysis

Data were collected using a pre-validated semi-structured self-administered questionnaire that was adapted from the literature [13], modified to match with the current study's objectives and population. A total of 120 questionnaires were distributed through the convenience sampling method [14]. The questionnaire was used to obtain information regarding the respondent's demographic data, self-medication with antibiotics, reasons for practicing self-medication, antibiotic name, and antibiotic source.

Data were analyzed via the Statistical Package for Social Sciences SPSS, version 23 [15]. Descriptive statistics were used to describe the data; continuous data presented as mean \pm SD, and categorical data expressed as numbers with percentages. The level of 0.05 was the cutoff point for statistical significance with a confidence level of 95 %. Binary logistic regression was used to determine the association between categorical groups, i.e. socio-demographic characteristics and self-medication outcome.

3. RESULTS

3.1 Characteristics of the Study Population

From the 120, 20 responses were excluded due to incomplete information and responses. One hundred participants from the general population living in Erbil city were surveyed. The overall mean age of the participants was 30.46. Table 1 shows that more than half of respondents, 53 % were males, and almost half of them 47 % were employed. Table 3 shows that only occupational status was shown to be significantly associated with self-medicating with antibiotics (OR 0.114 0.013-0.981, $p=0.048$). Nevertheless, there was no statistically significant association between

age, and gender VS self-medication with antibiotics.

3.1.1 Antibiotic use, self-medication with antibiotics and source of obtaining the antibiotic treatment

Table 2 shows that self-medication with antibiotics found to be prevalent 90 % among the general population in Erbil city as they reported that they self-medicate with antibiotics. The most commonly antibiotics used for self-medication were amoxicillin 39 % followed by (amoxicillin + clavulanic acid) 23 %, cephalexin 20 %, cefixime 2 %, and others 16 %. More than half of the respondents, 54 % reported that convenience was the most common reason for choosing to self-medicate with antibiotics.

Table 1. Socio-demographic characteristics of respondents (N=100)

Variables	Number of respondents, (n)	Percentage of respondents (%)
Age Range (years old)		
0-17	1	1
18-39	80	80
40-59	19	19
Occupation		
Employed	47	47
Unemployed	53	53
Gender		
Male	53	53
Female	47	47

Table 2. Self-medication with antibiotics, and reason for self-medication with antibiotics (N=100)

Variables	Number of respondents, (n)	Percentage of respondents (%)
Self-medicate with antibiotic		
Yes	90	90
No	10	10
Name of antibiotic		
amoxicillin + clavulanic acid	23	23
Amoxicillin	39	39
cephalexin	20	20
cefixime	2	2
others	16	16
Reason for self-medicating with antibiotic		
Convenience	54	54
Cost	27	27
Other	19	19

Table 3. Logistic regression analysis identifying the variables significantly associated with Self-Medication with antibiotics

Independent Variables	Variable Coefficient (B)	p	OR (95% CI) Adjusted
Self-Medication (Yes)			
Occupation			
Unemployed	-2.169	0.048	0.114 (0.013-0.981)
Employed	-	-	1.00

3.1.2 Source of antibiotics and considerations taken by the respondent towards self-medication with antibiotics

Sources of antibiotics were as follows: community pharmacy 38%, previous treatment 36%, and relatives or friends 26 % (Fig. 1). The most-reported compliant associated with self-medication with antibiotics was common cold 59 % (Fig. 2).

Our findings showed that the majority of the respondents (71 %) checks the package inserts for use instructions. At the same time, most respondents reported that they feel satisfied from self-medicating with antibiotics, i.e. the feeling that they have been treated successfully (Table 4).

4. DISCUSSION

To our knowledge, this is the first study that describes self-medication with antibiotics among the public population in Erbil city, Iraq. The prevalence of self-medication with antibiotics as previously mentioned is much higher in a developing country when compared with undeveloped ones [16]. This study mainly focused on the public population in Erbil city. Self-medication with antibiotics was prevalent in the current study despite the substantial risks associated with the self-medication with antibiotics [4]. When compared with developed countries, self-medication with antibiotics is much lower in countries such as Spain 41% [17]. Moreover, Swedish population showed to have a restrictive behavior towards antibiotic self-medication [18,19]. Furthermore, a study in Saudi Arabia reported that only 34% of their study’s respondent practiced self-medication with antibiotics [20]. This can be a result of the new executive regulations of health practice law that was implemented by Saudi Arabia in 2018, as it prohibits dispensing antibiotics without prescription [21]. Although pharmacists are considered one of the most frequently reported sources of medication related information [22]. In Iraq, although dispensing antibiotics without prescription is prohibited, pharmacists tend to

sell and provide antibiotics without medical prescriptions. This was confirmed by our current study as 38% of the respondents obtained the antibiotics from community pharmacies. Pharmacists plays an important role in the implementation of antimicrobial stewardship strategies [23]. Therefore, future studies should focus on the evaluation of pharmacists’ attitudes and perceptions towards AMS.

A study done involving Latin population showed that more than half of the population were self-medicated and most were adults [1]. Besides, another survey showed that most of the respondents obtained their antibiotics from family members, [24]. Moreover, Pylpa et al. (2001) described that the self-medication with antibiotics in Mexican women is high and it is due to comparing their health complaints relative to their cases and using it as experience bases for choosing the antibiotic [25]. The importance of previous experience in self-medication with antibiotics shown to be a recurrent theme in the literature of antibiotic utilization i.e. patients may obtain and select the antibiotic based on their previous experiences to cure similar symptoms with similar medicines and it is more comfortable to them especially when there is no barrier or restriction preventing them from obtaining the antibiotic from the pharmacy [26]. Evidently, obtaining drugs from pharmacies without prescription is the leading cause of self-medication with antibiotics, and it is most frequent in eastern and southern countries [27]. Antibiotics for self-medication are obtained from several sources. They are either already available as an over the counter drug i.e. dispensed without prescription, or from previous prescriptions by the physician, or obtained from relatives or friends, or obtained from the internet [28]. In our study, pharmacy was the most frequently reported source of antibiotics; the same findings were seen in Albania in 2014 by Jorgji [29]. Furthermore, a study conducted by Contopoulose and colleagues stated that 77 % of Greek pharmacies offered antibiotics without prescription, the antibiotics delivered for treating common cold symptoms [30].

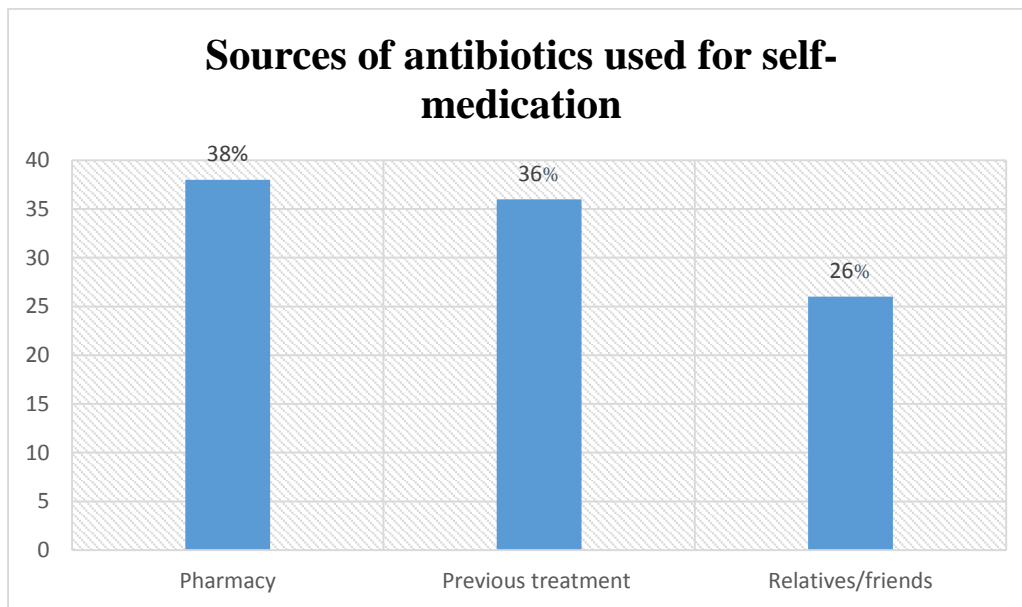


Fig. 1. Sources of antibiotics used for self-medication

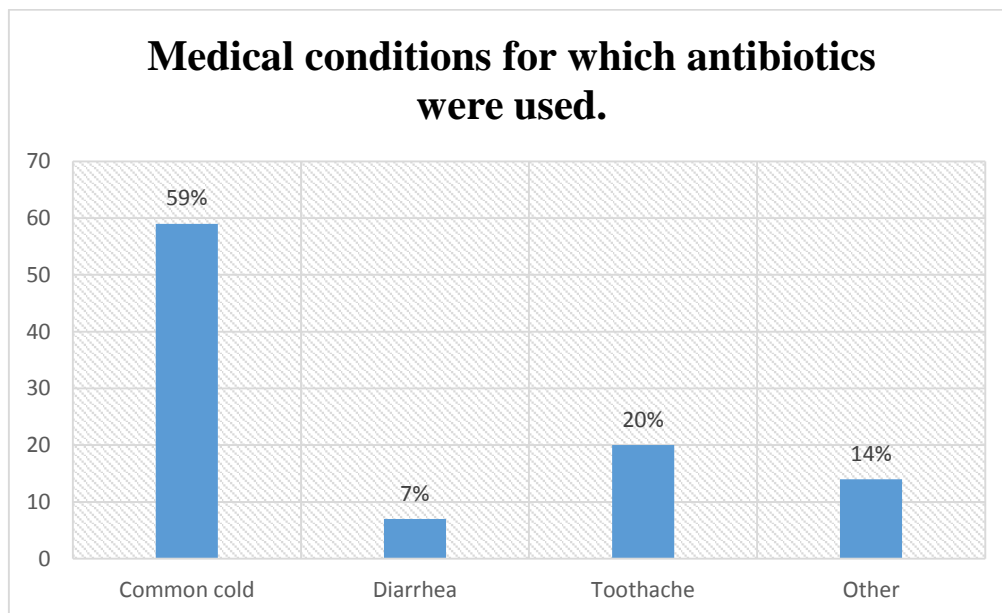


Fig. 2. Medical conditions for which antibiotics were used (self-medication).

Table 4. Attitudes (reading leaflet) and satisfaction towards self-medication with antibiotics (N=100)

Variables	Number of respondents, (n)	Percentage of respondents (%)
Reading medication leaflet		
Yes	71	71
No	29	29
Satisfaction from self-medicating with antibiotics		
Yes	77	77
No	23	23

The current study showed that there is no significant association between the self-medication with antibiotic with age, and gender. Similar findings were obtained from a study done in Karachi. The study's findings showed no association of demographic factors such as gender, marital status, and educational backgrounds with self-medication with antibiotics [31].

However, our study showed that unemployed individuals are significantly less likely to self-medicate with antibiotics, such association was also observed by a study in Lithuania [32]. Similar findings were observed in a study conducted in Jordan, the study showed that self-medication with antibiotics was found to be significantly associated higher levels of income and education [33].

Antibiotics may have serious risks when it is administered without prescription, but again, many people choose this way for treating many health issues. One of our findings was about the reasons that leads to self-medication with antibiotics. Most of the respondents reported that they self-medicate with antibiotics as it is more convenient and less expensive. Similarly, a study done by Shah et al. (2014) stated that the most common reason for self-medication with antibiotics was to save time, previous successful treatment experience, and the cost [31]. Low population's satisfaction with health care center services and lack of medicines in governmental hospitals/clinics can be one of the causes of self-medication [34]. Therefore, it is important to conduct further studies and surveys to assess the population's satisfaction with health care center services for better understanding, especially for outpatient clinics.

Regarding the type of antibiotic used for self-medication, in this study, the most commonly used was amoxicillin followed by amoclan (amoxicillin + clavulanic acid). This can be due to the antibiotic's safety as it can be used in a variety of population and age groups including children and pregnant women, and it is widely used for several indications including upper respiratory tract, lower respiratory tract infection, tooth infection, and even in some cases of urinary infections [35]. The fewer adverse reactions of this drug, being available in different dosage forms and with different strengths, these factors can contribute to such practice (i.e. self-medication with antibiotics) [35]. It is available in all of the pharmacies with affordable price in our

country. All these make it the drug of choice for self-medication; moreover, some families store it and give it to relatives when needed.

In our study, the leading medical problem i.e. compliant that led to self-medication with antibiotics was the common cold. It can be the reason for selecting amoxicillin as the most commonly used one [36]. The same findings were found by a study done in Albania in 2014, according to the study findings, the most commonly used antibiotic was amoxicillin, followed by amoxicillin / clavulanic acid. The less common one was trimethoprim [29]. Another study showed the same results for the most commonly used antibiotic for self-medication. About 41 % of the participants used amoxicillin for the self-prescribed antibiotic, followed by metronidazole 30.5%, erythromycin and ampicillin/cloxacillin were the least ones 6.7 % and 6.2 %, respectively (Shah et al.,2014). These findings also match the common reasons highlighted for self-medication with an antibiotic in the previous studies (Zhu X et al.,2015). In contrast, a study in Greece reported that cephalosporin, was the most widely used antibiotic [37].

Most of current study's participants admitted that they are satisfied with self-medicating with antibiotics, this can be due to their ability to obtain information from the internet, and getting online learning sources. Also, this can be due to previous experiences and continuous antibiotic use that make them believe that they have the enough knowledge to treat and choose their antibiotic without a physician prescription. Similar results were obtained by a study done by Shah and colleagues showed that 42.8 % of young participants self-medicated with antibiotics, 77 % of them were satisfied and believed that they could successfully treat infections with self-medication. [31]. This may be due to previous experiences and continuous antibiotic use that make them believe that they are knowledgeable enough to treat and choose their antibiotic without a physician prescription. In a similar manner, in Albania 34.7% stated that they are satisfied with self-medication with antibiotics [29].

Regarding reading the antibiotic's package insert, 71 % of current study participants stated that they read the antibiotic's package insert i.e. leaflet, this is much higher when compared with a study conducted in Albania as only 36 % of their participants read the package insert [29]. Therefore, concerted effort needs to be done to

minimize unnecessary risks associated with self-medication with antibiotics. Extended hands-on guidance and more effort is needed to educate the public population, and encourage patients to obtain antibiotics from a certified physician.

The current study has provided an insight to the practice of self-medication with antibiotics among public population in Erbil city, Iraq. However, there are several limitations including the close-ended questions in the questionnaire which may have restricted the participants' capacity to explain the underlying reason for a certain outcome and the capacity of the study's finding to be generalized to other geographical areas. Moreover, current study did not assess the impact of race on the use of antibiotics as it has been shown that race can affect the use of medication and patients' knowledge about health issues in other populations [38-40]. Therefore, it is recommended that future research is required to assess these points and involve various regions of Iraq.

5. CONCLUSION

In Erbil city, despite so many health care centers in different regions, self-medication with antibiotics were found to be prevalent. In the era of antimicrobial resistance, such behaviors can be significantly associated with the emergence of antimicrobial resistant strains of microorganisms. Drug administration in Erbil city should advocate antimicrobial stewardship strategies and should implement regulatory controls on selling and distributing the antibiotic to reduce the frequency of antibiotic misuse.

CONSENT AND ETHICAL APPROVAL

This study was approved by the ethical committee at Tishk International University, Erbil, Iraq. Moreover, verbal consent was taken from all study participants before filling the questionnaire.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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