

Antimicrobial Consumption and Resistance in Iraq (Diwaniyah City)

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Abstract: Antimicrobial resistance develops naturally over time, typically as a result of genetic alterations, although it is speeding up as a result of antibiotic abuse. Due to a dearth of studies and research, the health awareness and behaviors of this minority in Iraq are rarely examined. This study assesses a sample of the Iraqi population in the Iraqi city of Diwaniyah's health awareness about antibiotic use and antimicrobial resistance. It was also discussed how much they interacted with medical professionals on antibiotics used to treat bacteria and variations in antibiotic use. A descriptive, cross-sectional questionnaire-based survey was conducted. Data were collected during the period from November 2023 to April 2024. The study included a random sample of Iraqi adults (> 18 years old) residing in the city of Diwaniyah in Iraq. The study included 514 participants. 319 of the participants agreed to buy antibiotics without a prescription, 83 of the participants agreed to buy the antibiotic despite the doctor's refusal, 137 of the participants agreed to obtain antibiotics from friends or relatives, and 178 of the participants agreed to consult the medicine leaflet for instructions for use. Without consulting a doctor or pharmacist. 324 of the participants agreed to complete the course of antibiotics. About 403 of the sample included viral diseases (bronchitis, fever, cold) as an indication for the use of antibiotics. 227 of the participants adhered to doctors' instructions regarding the use of antibiotics. 319 of the participants agreed that pharmacists provide instructions on the correct use of antibiotics all the time, while 187 of the participants believed From the participants, doctors provide instructions on the correct use of antibiotics. There are gaps in knowledge of the use of antibiotics and the causes of antimicrobial resistance among the study participants, and these gaps should be used in planning educational campaigns to raise community members' awareness of the correct use of antibiotics Access to antibiotics is essential to address their misuse.

Keywords: Antimicrobial Consumption, Antimicrobial Resistance, Antimicrobial.

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Research Paper

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INTRODUCTION

The ability of microorganisms (including bacteria, viruses, and certain parasites) to thwart the effects of antimicrobial medications (such antibiotics, antivirals, and antimalarials) is known as antimicrobial resistance [1]. Standard therapies become ineffective as a result, and the infection continues to exist and may spread to other people. The successful treatment of certain infectious diseases that are caused by bacteria, parasites, viruses, and fungi is threatened by antimicrobial resistance, a growing global public health issue that makes patient care challenging, costly, or even impossible [2, 3]. Antimicrobial resistance raises mortality rates and lengthens the course of illness. The extent of the issue in the nation is still unclear, as is the effect of this resistance on public health, the expenses

incurred by the healthcare industry, or society at large [4, 5]. Antibiotic resistance develops naturally over time, mostly as a result of genetic alterations, although it is speeding up as a result of both human and animal overuse and abuse of antibiotics [1]. The dangers of medical treatments including organ transplants, cancer chemotherapy, diabetes treatment, and major surgeries (such hip replacements or cesarean sections) will significantly increase in the absence of efficient antimicrobials to prevent and treat infections [6]. Iraqis have suffered from severe conditions since 1991 and monitoring their health status has been difficult, due to their large number and sparse distribution. Unfortunately, information regarding the health status, There is a dearth of study on the beliefs and practices of this community. Given the size of the Iraqi population, consideration of their health issues and customs is

warranted. Assessing the degree of knowledge on the appropriate use of antibiotics and the causes of antimicrobial resistance in this community seemed helpful because antimicrobial resistance is spread among communities. This was the main topic of this research, along with an examination of their degree of communication with medical professionals on the use of antibiotics and variations in their application in Iraq [7].

METHODOLOGY

Study Design and Population

This was a descriptive, cross-sectional questionnaire-based survey. Data were collected during the period from November 2023 to April 2024. The study included a random sample of Iraqi adults (> 18 years old) residing in Diwaniyah province. The sample was drawn from multiple locations, taking into account the geographic distribution representing different socioeconomic classes. Study sites included community pharmacies in densely populated Iraqi areas of the city (n = 68), patients attending the public health laboratory (n = 91), the Women's and Children's Hospital (n = 119), the university (n = 102), and well-known health care centers in Governorate (n=79), and cafes (n = 58). Participants' consent was obtained verbally before distributing the questionnaires. Participants were assured of the confidentiality and anonymity of the results.

Study Tool

Design and Development of the Questionnaire

The microbiological researcher evaluated pertinent literature and created the questionnaire. The questionnaire was created and data gathered in Arabic, which is the mother tongue of Iraqis. To make any confusion clear. Every attempt was made to shorten the questionnaire in order to increase participation without sacrificing the study's goals. There were twenty-eight questions on the survey. It looked into five key areas:

- a) Participant demographic information (4 questions): age, gender, educational level, and occupation.
- b) Participants' use of antibiotics (9 questions): Purchasing antibiotics from the pharmacy without a prescription, purchasing antibiotics despite the doctor's refusal, obtaining antibiotics from a friend or relative, keeping leftover antibiotics for later use, Reviewing the medication leaflet to obtain instructions for use. Without consulting a doctor or pharmacist, stop taking antibiotics as soon as you feel better, familiarize yourself with the names of antibiotics, and the use of antibiotics during the past 12 months. And complete the course of antibiotics.
- c) Awareness of the action of antibiotics (8 questions): It included whether antibiotics are effective against bacteria, are antibiotics effective against viruses,?Were antibiotics effective against bacteria and viruses?,

Knowledge of the action of antibiotics, Viral diseases (bronchitis, fever, and cold), Do you know the diseases that require the use of antibiotics?, Antibiotics speed up recovery from colds, and the antibiotics used vary from one disease to another last.

- d) Awareness of antimicrobial resistance and its causes (2 questions): It included the excessive use of antibiotics that increases the possibility of the development of resistance, and awareness of the extent of the problem of antimicrobial resistance.
- e) Professional interaction between the patient's health and the use of antibiotics (5 questions): It included adherence to doctors' instructions regarding the use of antibiotics, requesting an antibiotic if the doctor did not prescribe it for you, trusting the decision of the doctor who does not prescribe an antibiotic contrary to the patient's preferences, and providing pharmacists with instructions. About the use of antibiotics, and doctors provide instructions on the use of antibiotics.

Question Format:

Two of the sixteen questions had a "yes" or "no" response, while the remaining sixteen were statements for which participants may select "I agree," "I disagree," or "I do not know." Participants could select an answer for each of the five statements that made up the questions. Either "always," "most of the time," or "occasionally."

Data Analysis

SPSS 17.0 was used to code and analyze the data. Quantitative statistics and tests for significant correlations between sample demographics and awareness of antibiotic usage and antimicrobial resistance were part of the data analysis. Chi-square and Fischer exact tests were used to analyze significance, which was defined as $p < 0.05$.

RESULTS

Sample Size and Demographics

514 Iraqi adults who lived in the city of Diwaniyah, Iraq, consented to complete the questionnaire for this study, and 100% of them did. Since three of the cases were under the age of 18, they were disqualified. Table 1 displays the participants' distribution among the study locations where they were recruited. There were roughly equal numbers of males and females. Sixty-one percent of the sample had a university degree, seven percent employed in medical-related industries, and sixteen percent were under 65 (Table 2). (Figs. 1, 2, 3, 4, 5).

Knowledge and Use of Antibiotics

Two-thirds of those who took part When asked whether they knew the names of any antibiotics, 33% (n

= 170) gave a positive response, 67% (n = 344) said they did not, and 1% (n = 3) of the sample had missing data. The capacity to name antibiotics was shown to be significantly ($P < 0.001$) correlated with older age, educational attainment, and medical occupation, but not with gender.

The majority of participants 65% (n = 335) had used antibiotics in the past 12 months; 35% (n = 179) did not use an antibiotic. Whether or not antibiotics had been used within the past 12 months was seen more frequently in younger than older age groups ($P < 0.001$). 63% (n=324) of participants responded to completing the antibiotic regimen. However, 37% (n = 190) of individuals indicated that they would not finish the antibiotic course. Of the participants, 47% agreed to save any leftover antibiotics for later use, 27% agreed to get antibiotics from a friend or family member, and 62% consented to purchase antibiotics from the drugstore without a prescription. When they felt better, 30% of the sample agreed to cease receiving treatment. Participants with lower levels of education showed this to be significantly different ($P < 0.05$) (Table 3). Higher educated participants were significantly different from those who read pamphlets about antibiotics without consulting a physician or pharmacist ($P < 0.05$).

Awareness of Antibiotic Actions and Indications

31% of participants (n = 158) were aware that antibiotics worked against bacteria, 18% (n = 91) thought they worked solely against viruses, and 10% (n = 149) thought they worked against both bacteria and viruses. As well as viruses. 10% (n = 53) were unaware of how antibiotics worked. While knowledge that antibiotics work against bacteria rather than viruses was significantly correlated with medical occupation and educational level ($P < 0.001$), knowledge of the diseases for which antibiotics should be used was not correlated with occupation, education, or any other demographic factor.

78% (n = 403) of participants selected viral infections, mainly bronchitis, fever, and cold, as the reason for using antibiotics, whereas 9% (n = 46) were unsure of which ailments called for antibiotic use. The statement "Antibiotics speed up recovery from the common cold" was accepted by 54% of participants (n = 279), opposed by 35% (n = 178), and unknown by 11% (n = 57). There was a substantial correlation ($P < 0.001$) between this and educational level. The statement "The antibiotics used vary from one disease to another" was accepted by 75% of participants (n = 387), opposed by 146% (n = 72), and was unknown by 11% (n = 55) (Table 3).

Table 1: Participants' capturing sites, number and percentage

Site of capturing sample	No. of participants (%)
Community pharmacies	68(13)
Women's and Children's Hospital	119(23)
Al-Qadisiyah University	102(20)
Public health laboratory	91(43)
Health care centers	79(18)
cafes	58(15)
Total samples size	517(100)

Table 2: Study sample demographics

Demographic variable	Number (%)
Gender	
Male	272(53)
Female	242(47)
Total	517(100)
Missing	3(1)
Age group	
25-18	228(44)
45-26	181(35)
65-46	84(16)
Above 65 years	21(16)
Total	517(100)
Missing	3(1)
Education	
High school or less	91(18)
College	66(13)
University	312(61)
Postgraduate studies	45(9)
Total	517(100)
Missing	3(1)

Demographic variable	Number (%)
Job	
Medical jobs	49(10)
Non-medical jobs	148(29)
Students	173(34)
Don't work	144(28)
Total	517(100)
Missing	3(1)

Table 3: Participants' perceptions regarding use of antibiotics

A- Participants' use of antibiotics:				
Variable	Agree (%)	Don't agree (%)	Don't know (%)	Missing (%)
Buy antibiotic from pharmacy without a prescription	319 (62)	155(30)	40(8)	3(1)
Buy antibiotic despite disapproval of physician	83(16)	385(75)	41(8)	3(1)
Obtain antibiotic from a friend or a relative	137(27)	363(71)	14(3)	3(1)
Keep leftover antibiotic for later use	241(47)	227(45)	46(9)	3(1)
Refer to drug leaflet for instructions on use without asking a physician or a pharmacist	178(35)	283(55)	51(10)	3(1)
Discontinue antibiotic course once feeling better	153(30)	328(64)	31(6)	3(1)
	Yes	No		
Know the names of antibiotics	170 (33)	344 (67)		3(1)
Use of antibiotics over the past 12 months	335 (65)	179(35)		3(1)
completing an antibiotic course.	324 (63)	190(37)		3(1)
B- Awareness of antibiotic action:				
Variable	Agree (%)	Don't agree (%)	Don't know (%)	Missing (%)
Were antibiotics effective against bacteria?	158(31)	95(18)	261(51)	3(1)
Were antibiotics effective against viruses?	91(18)	142(28)	281(55)	3(1)
Were antibiotics effective against both bacteria and viruses?	49(10)	287(56)	178(35)	3(1)
Knowledge of the action of antibiotics	282(55)	179(35)	53(10)	3(1)
Viral diseases (bronchitis, fever, cold)	403(78)	71(14)	40(8)	3(1)
Do you know the diseases that require the use of antibiotics?	417(81)	51(10)	46(9)	3(1)
Antibiotics speed up recovery from colds	279(54)	178(35)	57(11)	3(1)
The antibiotics used vary from one disease to another	387(75)	72(14)	55(11)	3(1)
D- Awareness of antimicrobial resistance and its causes:				
Variable	Agree (%)	Don't agree (%)	Don't know (%)	Missing (%)
Excessive use of antibiotics increases the likelihood of resistance developing	362(70)	125(24)	27(5)	3(1)
Awareness of the extent of the problem of antimicrobial resistance	263(51)	227(44)	24(5)	3(1)
E- Professional interaction between patient health and the use of antibiotics				
Variable	all the time	most of the time	sometimes	Missing
Adhere to doctors' instructions regarding the use of antibiotics	227(44)	263(51)	24(5)	3(1)
Request an antibiotic if their doctor has not prescribed one	209(41)	289(56)	16(3)	3(1)
I trust the decision of a doctor who does not prescribe an antibiotic contrary to the patient's preference	269(52)	223(43)	22(4)	3(1)
Pharmacists provide instructions on the use of antibiotics	319(62)	179(35)	16(3)	3(1)
Doctors provide instructions on the use of antibiotics	187(36)	315(61)	12(2)	3(1)

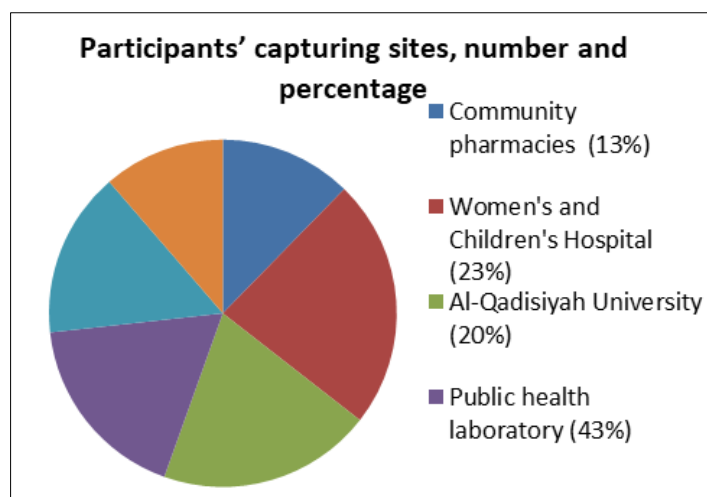


Figure 1: Participants' capturing sites, number and percentage

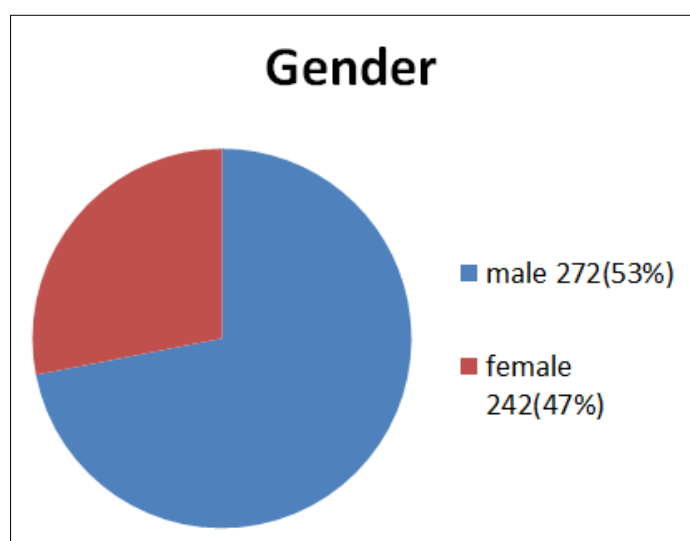


Figure 2: Gender of Participants

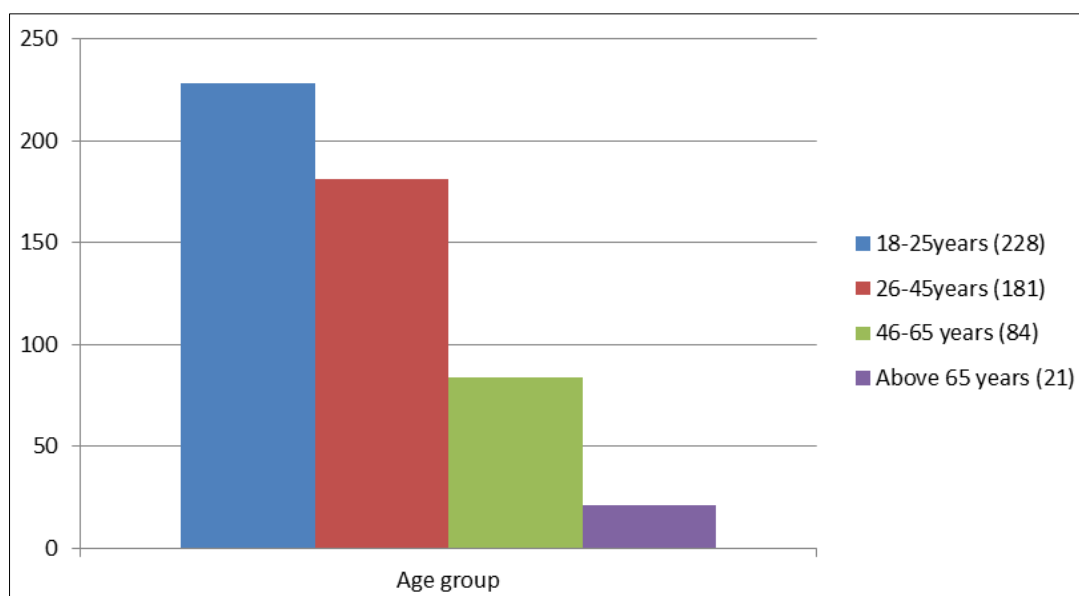


Figure 3: Age groups

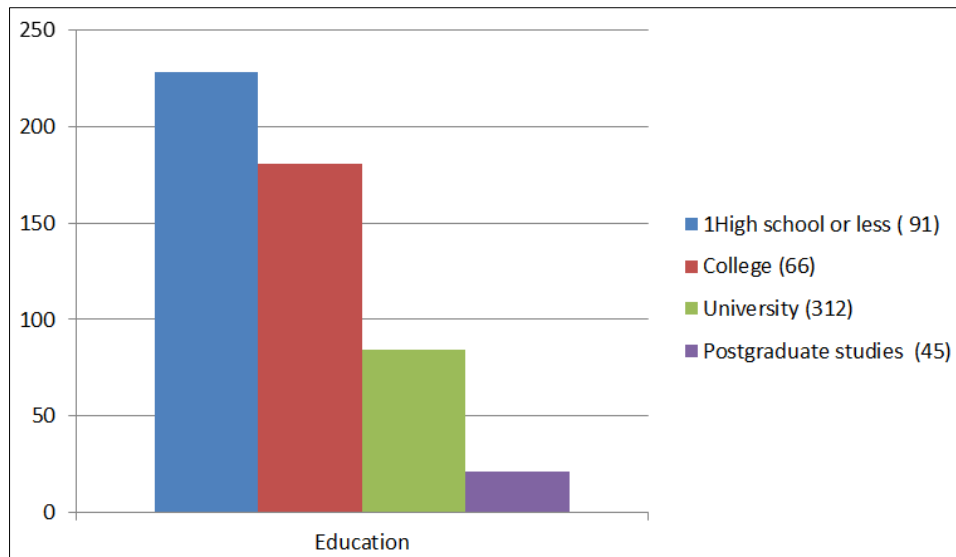


Figure 4: Education of participants

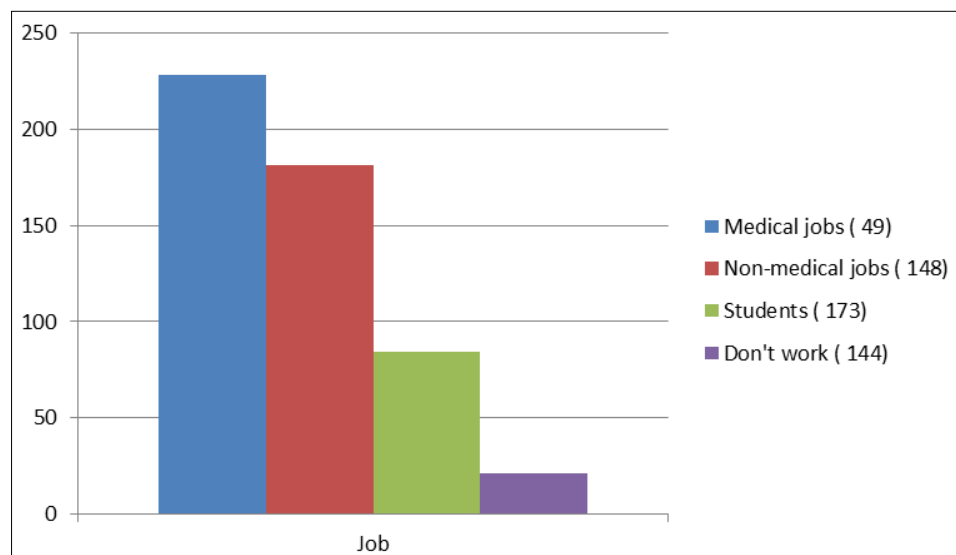


Figure 5: Job of Participants

Awareness of Antimicrobial Resistance and Its Causes

The statement "Overuse of antibiotics increases the likelihood of resistance developing" was accepted by 70% of participants ($n = 362$). 5% ($n = 27$) were unsure, and 24% ($n = 125$) disagreed. Both educational attainment and medical occupations were substantially correlated with this ($P < 0.001$). Longer sickness duration, more medical visits, and the need for more costly drugs were the sample's top assessments of the effects of antimicrobial resistance. In terms of understanding the scope of the issue, 51% ($n = 263$) think that antimicrobial resistance is a concern both globally and in the Iraqi city of Diwaniyah. In contrast, 44% ($n = 227$) did not think there was a problem, and 5% ($n = 240$) did not know whether it was antimicrobial resistance or not. It was a problem or not in Diwaniyah city, Iraq and around the world. (Table 3)

Patient-Health Professional Interaction Relevant to Antibiotic Use

44 percent of participants ($n = 227$) indicated that they adhered to their doctors' instructions about antibiotic use all the time, 51% ($n = 263$) reported most of the time, and 5% ($n = 24$) sometimes, 41% ($N = 209$) of participants answered the statement "Seek an antibiotic if the doctor does not prescribe it for you all the time," and 56% ($N = 289$) answered "most of the time," while 3% ($N = 16$) answered "sometimes." While participants responded 52% ($N=269$) to the statement, "I trust the decision of a doctor who does not prescribe an antibiotic contrary to the patient's preferences all the time," and 43% ($N=223$) answered most of the time and 4% ($N=22$) sometimes. Age was not substantially correlated with following doctor's orders, but educational attainment was. Additionally, there was a stronger correlation between a higher educational level and not seeking antibiotics when they weren't given, as well as

having confidence in doctors' decisions ($P < 0.001$). 36% ($n = 187$) of the sample thought that doctors always give advice on how to use antibiotics, whereas half ($n = 319$) of the sample thought that pharmacists always do so (Table 3).

DISCUSSION

This study reveals gaps in knowledge on the usage of antibiotics and the causes of antimicrobial resistance. The vast majority of the study sample reported using antibiotics to treat viral infections rather than bacterial ones, which is especially connected to self-medication and misunderstandings regarding the guidelines for antibiotic use. The majority of our sample reported buying antibiotics without a prescription, which is in line with a number of earlier Jordanian research [8-10], and from Iraq [11, 12]. And from other countries [13, 14]. This indicates that self-medication practices are common among most community members in the city of Diwaniyah, and Iraq. Numerous elements that encourage self-medication are highlighted in the literature. Our societies exhibit many of these characteristics. First, those with low incomes are more likely to look for ways to cut expenses. Some examples include contacting pharmacists directly to save money on medical consultations, getting prescriptions from family members, or storing any unused medications for later use. Although per capita income and its impact on antimicrobial usage are not covered in this study, Iraq's economic limitations are widely known [15]. It is expected that economic restrictions will be more severe among members of Iraqi society, the majority of whom depend on resources that are at risk due to the ongoing unrest in their country [16]. Second, the public does not fully understand the gravity of the antimicrobial resistance problem [17]. The majority of our sample's responses likewise demonstrated this. Third, there is a belief that taking antibiotics to treat viral infections and mild illnesses is appropriate [17, 18]. It was also amply illustrated in our investigation. Additional justifications for self-medication include the availability of antibiotics, previous knowledge of the efficacy of treatment, and avoiding doctor's office wait times [18, 19]. The latter reason has been discussed numerous times in earlier local research, all of which have placed a strong emphasis on upholding the regulations that already forbid buying antibiotics without a prescription. But as of yet, none of these law enforcement-related suggestions have been implemented. These findings were superior to those reported in other research in terms of understanding the significance of finishing the course of antibiotics even when feeling well and the fact that antibiotics have no effect on the rate at which a cold is recovered [13, 14]. Similarly, adherence to physician orders and awareness of antibiotic resistance were higher than those reported from nearby nations like Egypt and Syria [13]. Conversely, our group had lower levels of awareness of antimicrobial resistance linked to antibiotic abuse and

retention of leftover antibiotics for future usage than earlier research [20, 14].

Regarding the use of antibiotics in Iraq, the prolonged sanctions placed on the country resulted in a serious lack of medications [21]. In addition to confirming the poor level of health information among research participants, it also supports the belief held by the majority of the sample that a wide variety of antibiotics are unavailable in Iraq. Other studies have also brought attention to the habit of asking doctors for antibiotics in public when they are not recommended in this study [22, 23].

Additionally, the high percentage of participants who thought that doctors occasionally gave instructions about the usage of antibiotics might be a sign of patients' discontent with their medical care. However, the fact that most respondents to the survey stated that pharmacists constantly explain antibiotics highlights the critical role that pharmacists can play in teaching patients and defending the use of antibiotics a duty that is actually far from being fulfilled. Total possibility. Indeed, it has been explicitly claimed that the widespread abuse of antibiotics in our society is the fault of pharmacists and other medical professionals [24]. Data collection was challenging, particularly in cafes and pharmacies. In the beginning, 13% of pharmacies responded. We ascribe the low participation rate to this lack of interest in research activities.

CONCLUSIONS

It is important and necessary that the gaps and problems identified in public awareness and practices related to antibiotics during this study help in designing educational campaigns to address the problem of antibiotic misuse. Instead of merely disseminating knowledge, the research suggests concentrating on initiatives meant to alter the conduct of both public and health care personnel. Research and studies carried out in Iraq have so far been comparatively limited and descriptive. Quantifying the purchase of antibiotics is necessary to lower the degree of abuse and assess how initiatives affect real-world behaviors. The decision-making health authorities must take concrete, significant action to limit access to antibiotics and raise community understanding of their safe use if any improvement in the current state of affairs is to be accomplished.

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