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Antibiotics use without Prescription in the Kingdom of Bahrain

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Introduction: An increasing phenomenon of over-the-counter anti-bacterial drug usage has been reported in several studies within the literature worldwide. Similarly, multiple recent studies conducted in the middle east and Arabian gulf countries have also reported a dramatic increase in over-the-counter antibiotics usage. This misuse of antibiotics and lack of practical constraints is alarming as it is one of the main consequences of the emergence of multi-drug resistant strains associated with high morbidity and mortality.

Objective: This study aims to describe the prevalence, awareness and reasons for self-prescribing antibiotics within the Kingdom of Bahrain.

Material and Methods: Cross-sectional study was conducted through the general population attending primary healthcare within 24 primary healthcare centers in the Kingdom of Bahrain. Respondents were randomly selected using a multistage clustered random sampling technique. Data were entered into SPSS software and analyzed.

Results: A total of 640 participants filled out the survey form. Most participants were females (59.2%), and 76.6% were aged between 28-39 years old. 49.7% of the population consumed antibiotics without a prescription over the last year, and 76.1% consumed them at least 1-3 times a year. The most common complaints associated with self-prescription were upper respiratory tract infection and fever, 27% and 24%, respectively.

Conclusion and Recommendations: A significantly high prevalence of over-the-counter antibiotics usage was noted based on this study, which is an alarming phenomenon that needs to be addressed urgently to prevent any further undesirable complications in the future. Moreover, strict and dedicated measures on personal and public levels must be taken urgently to limit this phenomenon.

Keywords: Over the counter antibiotics, antibiotic misuse, antibiotic, community pharmacy, antibiotic resistance.

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INTRODUCTION

Anti-bacterial drugs should not be dispensed unless the patient has a valid prescription. Over the last few decades, however, obtaining an anti-bacterial drug without prescription (over the counter) is on the rise worldwide. Indeed, latest evidence has indicated that over 50% of antibiotics worldwide are obtained without a prescription, a phenomenon which indicates a significant threat to public health and calls for an immediate action[1]. This observation is especially alarming because it increases the emergence of multi-drug resistant strains which are associated with high morbidity and mortality[2-3]. Dispensing anti-bacterial drugs over the counter is common in the Gulf Cooperation Council states too. A recent study in Saudi Arabia investigated the prevalence of self-prescription of antibiotics in Riyadh city. The investigators sought information from 681 individuals. Results of this study showed that 78.7% of participants did practice self-prescription of antibiotics[4]. In another investigation in the United Arab Emirates, Dameh et al conducted a study to explore over the counter sale of antibiotics in community pharmacies in Abu Dhabi. The authors reported that 68.4% of the observed antibiotic sales were sold without prescription[5].

In the absence of strict laws to stop over the counter sale of antibiotics, overuse of these essential drugs is expected to rise and so the risk of spread of multi-drug resistant strains. Bacterial infections often present acutely and patients therefore seek quicker access to certain antibiotics. This behaviour could potentially shorten the duration of illness and reduce both the length of symptoms and infectivity, and minimize delaying treatment while waiting to see a physician[6]. Another reasons why the public tend to get antibiotics without a prescription is to save money that would have been spent on a medical consultation, especially in the private sector[7]. Interestingly, self-medication of antibiotics is common among immigrants, possibly due to limited access to primary health care services in some countries, language barriers, and tendency to use antibiotics which people brought from home countries[8].

The public use anti-biotics without a prescription for various indications. However, respiratory diseases such as cough, sore throat, and common cold were reported to be the most common[4]. Males have more tendency to consult a pharmacist rather than a physician when using an antibiotic compared to females and were more likely to use antibiotics for prophylaxis[9]. Regarding the type of antibiotics that are most commonly consumed without a prescription, Dameh et al reported that combination of penicillins and β-lactamase inhibitors, followed by extended spectrum penicillins and second generation cephalosporins were the mostly commonly sold antibiotic groups in Abu Dhabi[5]. In Saudi Arabia, however, amoxicillin was reported to be the most commonly self-prescribed antibiotic[4].

The irrational use of antibiotics is often associated with wrong dose or duration of therapy[1]. In Jordan, only 37.6% of patients who used self-prescribed antibiotics followed the correct dosage guidelines[10]. The use of antibiotics without a medical consultation is associated with major problems. Firstly, it causes continuous rise of antimicrobial resistance and concomitant lack of new therapeutic options to eradicate resistant strains. Latest reports have estimated that antibiotic resistance accounts for more than 2 million infections and 23,000 deaths annually in the United States[11]. Secondly, over consumption of antibiotics causes appearance of side effects, including allergic reactions. Thirdly, it results in death of the normal flora and overgrowth of opportunistic organisms such as Candida albicans and Clostridium defficile.

The global campaign against irrational use of antibiotics is far to come to an end. Although, raising physicians awareness may hamper them from over prescribing antibiotics, yet prescribers themselves are influenced by patients demands and expectations[12]. Therefore, the containment of such pandemic should target the public for their believes, expectations and accessibility of these drugs. In this study, we aimed to examine antibiotic consumption without prescription in Bahrain. We ought to understand the factors that underlie this behavior aiming to find solutions for this significant threat to public health.

Materials and Methods

Ethical approval

Ethical approval was sought from the research and ethics committee at the Arabian Gulf University and in addition to human resources and services department at the Ministry of Health in Bahrain. Detailed information sheet which

explains the aims and importance of the study was offered to the candidates who were asked to participate in this study. Participants were initially consented and informed that their participation will be anonymous and voluntary. Collected data was kept secure by the main investigator, and only be used for research purposes and not to be disclosed to any party.

Settings

People who reside in Bahrain are entitled for primary healthcare services provided by a network of 24 primary governmental health centers distributed over the different governorates of the Kingdom. The Ministry of Health divides the country into five governorates. In each one, 4-7 health centers provide primary medical services for people who live in that particular region. Prescriptions made within a health center are sent electronically to a pharmacy located within the same building where they are dispensed to patients. Private healthcare is also widely available in Bahrain. Drug dispensing is performed both in private hospitals and private healthcare center pharmacies as well as in community pharmacies. The Ministry of Health in Bahrain requests pharmacies across the country not to dispense any drug- other than over the counter ones- without a prescription.

Study design

This study was done as a cross-sectional study. By using a questionnaire which included three main sections. In the first part, we collected basic demographic information about the participant, including age, gender, nationality, educational level and occupation. In the second section, we sought information related to the participant`s consumption of antibiotics. Specifically, we asked participants about the frequency of using antibiotics without a prescription, and the most common indications for this behavior. In addition, we asked respondents about the reasons that led them to self-prescribe antibiotics. Information on the most commonly used antibiotics, source of obtaining the drugs, duration of therapy and dosage were also collected. For some of the items in the questionnaire, we used a 5-point Likert scale to record responses (strongly disagree, disagree, not sure, agree, and strongly agree).

Validation and reliability studies were conducted before the questionnaire is administered to the participants. The value of the reliability coefficient using Cronbach's Alpha was 0.811.

Statistical analysis

Collected data were entered and analyzed using the SPSS software, Chi-square test was used to measure the association between categorical variables. Logistic regression model was used to assess the adjusted ODDS ratios of the factors independently related to the outcome variable.

Results

A total of 640 participants were filled out the survey form. Most of the participants were females (59.2%) and 76.6% of the participants were aged between 28-39 years old and 43.8% of them have at least bachelor’s degree and 73.6% of the study population were working class.

Half of the study population (49.7%) were consuming antibiotics without a prescription over the last year and 76.1% of those consuming antibiotics without prescription were consuming at least 1-3 times in a year. The participants reported that they were obtaining antibiotics without prescription was from the local pharmacies (89.3%) and majority (62.3%) of them purchased antibiotics after consulting the pharmacist.30.8% of the participants did not consider any characteristics of the antibiotic they purchased.

Most of the participants expect sudden change in their condition when they start using over the counter antibiotics and decide to change the class of antibiotic without medical consultation if they feel no improvement or change. Also, 32.5% of the participants decide to discontinue taking the full course immediately after symptoms had subsided by themselves.

The most common complaints were depicted in figure 2, major complaints were runny nose (27%) and other reasons combined followed by fever (24%) and Urinary tract infection (17%).

A binary logistic regression analysis was conducted to observe the extent of the influence of purchasing antibiotics without prescription. The result shows that the age, nationality, education level and occupation have a significant relationship with the purchasing antibiotics without a prescription.

Table 1: Demographic characteristics of participants of total participants (n= 640)

Variable	Frequency (n)	Percentage (%)
Gender		
Female	379	59.2
Male	261	40.8
Age Group (years)		
<18	9	1.4
28-29	245	38.3
30-39	245	38.3
40-49	93	14.5
50-65	48	7.5
Nationality		
Bahraini	618	96.6
Non-Bahraini	22	3.4
Education level		
High school Degree	234	36.6
Diploma	102	15.9
Bachelor Degree	280	43.8
Higher Degree (Masters/ PhD, Professor)	24	3.8
Occupation		
Student	33	5.2
Unemployed	63	9.8
Employed	471	73.6
Retired	42	6.6
Others	31	4.8
Insurance		
No	626	97.8
Yes	14	2.2
Healthcare worker		
No	607	94.8
Yes	33	5.2

Figure 1: Antibiotic use according to knowledge

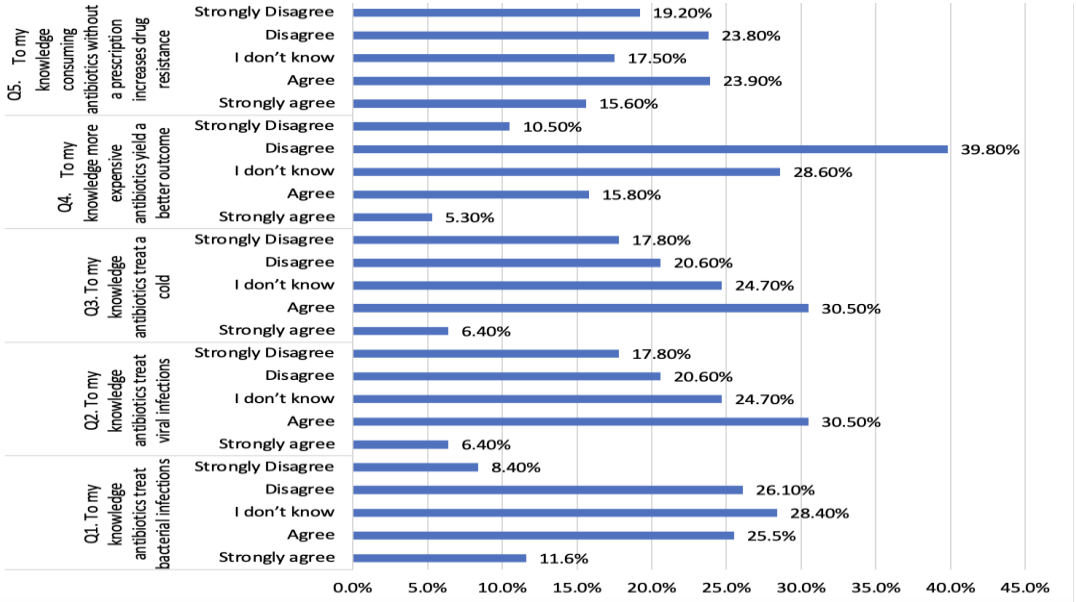

Table 2: Characteristics of antibiotic consumption without prescription

How many occasions during the year do you consume an antibiotic without prescription.	Percentage (%)
1-3 times	76.1
4-5 times	20.4
More than 6 times	3.5
Where do you obtain antibiotics without a prescription?	
Pharmacies	89.3
Friends and Family	6.0
Brought from abroad	1.3
Leftover from previous use	3.5
Your choice of antibiotic depends on what?	
Consulting a pharmacist	62.3
Previous prescription	19.2
Consulting a pharmacist; Previous prescription	8.5
The internet	4.7
Consulting a pharmacist; friend or family	1.6
Consulting a pharmacist; Friend or family opinion; Previous prescription	1.3
Friend or family opinion	0.9
Friend or family opinion; Previous prescription	0.3
Previous prescription; The internet	1.3
What characteristics do you pay attention to when buying an antibiotic?	
I did not consider anything	30.8
Antibiotic type	22.3
Adverse effect expected	8.5
Antibiotic type; Adverse effects expected	8.8
Number of times I have to consume it	8.8
Antibiotic type; Number of times I have to consume it; Brand or production country	6.0
other factors	14.8
How do you measure the dose of antibiotic before consuming?	
Reading the leaflet	9.12
Doctor's consultation	72.33
Pharmacist consultation	15.72
Previous experience	2.83
Did you change your antibiotic dose or type without a professional?	
No	94.1
Yes	5.9
Why did you change your antibiotic dose/type without professional consultation?	
The antibiotic had no effect	52.6
I felt better	18.4
To reduce adverse effect	15.8
The antibiotic expired	13.2
Have you ever read the leaflet attached to the antibiotic?	
No	57.5
Yes	42.5
When do you stop consuming an antibiotic?	
Several days later regardless or result	4.2
Immediately after symptoms had subsided	32.5
After running out of the medication	17.8
Depending on the professional consultation	45.5
What reasons leads you to consume an antibiotic without prescription?	
To save time consulting a doctor	18.8
To save money consulting a doctor	1.4
No need to consult a doctor	14.2
Other reasons	65.6

Figure 2: Most common complaints

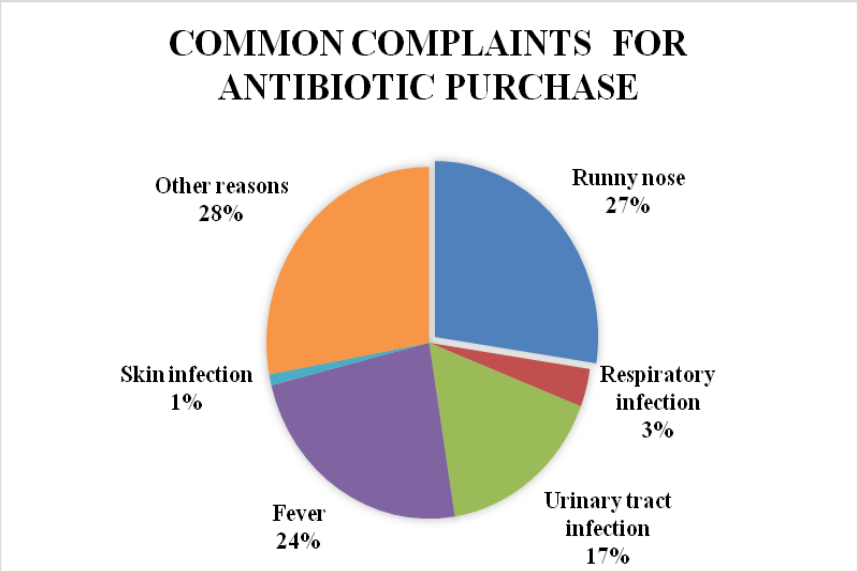

Table 3: Characteristics of 640 participants and antibiotic purchase without prescription

Variable	No antibiotics without prescription (n=322)	Antibiotics without prescription (n=318)	p-value
Gender			
Female	193 (59.9%)	186 (58.5%)	0.710
Male	129 (40.1%)	132 (41.5%)	
Age (years)			
<18	2 (0.6%)	7 (2.2%)	<0.001
18-29	141 (43.8%)	104 (32.7%)	
30-39	100 (31.1%)	145 (45.6%)	
40-49	47 (14.6%)	145 (45.6%)	
50-65	32 (14.6%)	16 (33.3%)	
Nationality			
Bahraini	318 (98.8%)	300 (94.3%)	0.002
Non-Bahraini	4 (1.2%)	18 (5.7%)	
Education level			
High school degree	115 (35.7%)	119 (37.4%)	0.001
Diploma	35 (10.9%)	67 (21.1%)	
Bachelors	159 (49.4%)	121 (38.1%)	
Higher Degree(Masters/PhD/Professors)	13 (4.0%)	11 (3.5%)	
Occupation			
Student	11 (3.4%)	22 (6.9%)	0.015
Unemployed	35 (10.9%)	28 (8.8%)	
Employed	231 (71.7%)	240 (75.5%)	
Retired	30 (9.3%)	12 (3.8%)	
Others	15 (4.7%)	16 (5.0%)	
Insurance			
No	314 (97.5%)	312 (98.1%)	0.605
Yes	8 (2.5%)	6 (1.2%)	
Healthcare workers			
No	311 (96.6%)	296 (93.1%)	0.050
Yes	11 (3.4%)	22 (6.9%)	

Discussion

Antibiotic drugs are a very important class of drugs which are fairly and commonly used in our practice. However, the incidence of misuse of these drugs has increased lately, this is mainly due to these drugs being easily accessible to the public without a prescription. In our study, we were able to establish that the prevalence of using antibiotics for self-medication is high. Our study revealed that about half of the population are consuming antibiotics without prescription, which is a significant result that needs further consideration and awareness in our society. In Saudi Arabia, it was reported that 78.7% of adult patients were consuming antibiotics without prescription[13]. In United Arab of Emirates, about 68.4% of antibiotics were sold without using prescription[14]. Therefore, GCC countries are sharing same issue regarding over-the-counter antibiotics by high percentages of unprescribed antibiotics. However, other regions have also high prevalence of consumption of unprescribed antibiotics. As in Greece, it was reported that 77% of patients were using antibiotics without prescription as self-medication[15].However, when comparing our results to countries in the European region, studies conducted in Denmark showed that self-drug use was 3%, whereas in Spain it showed 11%[16,17]. In Malta and Lithuania, the prevalence of self-drug use was 19% and 22% respectively[16,20]. A study in Europe showed that Greece had one of the highest antibiotics uses in Europe[15,20]. A substantial variation in the prevalence rates of antibiotics self-medication use among the European regions suggests that socioeconomic factors play a role, as do differences in healthcare systems. Another factor is the acquisition of antibiotics from pharmacies without prescription, which occurred most frequently in eastern and southern European countries[15,19]. In Jordan, 42.4% of the study's population sought a pharmacist's help in determining the dose of the over-the-counter medications[21]. Antibiotics acquired to be used as self-medication is made possible due to a variety of reasons. First, they are legally available as over the counter. In addition, previously prescribed antibiotics that have not been used are stored for future use without seeking medical consultation. Also, some of the unprescribed antibiotics are obtained through family members and friends, and nowadays they are easily can be ordered online[15,18].Moreover, in west Europe, only limited antibiotics are sold without prescription. As in United Kingdom, only azithromycin is available as a systemic over-the-counter antibiotic[22]. This highlights the governmental efforts to limit unprescribed medications especially antibiotics which prevent future serious medical issues. It was found that Augmentin was one of the most frequently dispensed antibiotics without prescription in Saudi Arabia[13].

Our results established that the majority of the population obtain antibiotics without prescription from the local pharmacies (89.3%), with (30.8%) of the participants acquiring the drugs without considering the characteristics of the antibiotics they purchased. Runny nose being the most common complaint (27%) driving patients to acquire antibiotics. In Catalonia, Spain, it was showed that most of the unprescribed antibiotics were dispensed for urinary tract infections by a percentage of 79.7%[23].

Based on our study results, our community needs to correct their thoughts about antibiotics to have well aware individuals. A Latino study revealed that one-third of their population believe that antibiotics should be available without a prescription which indicates lack of awareness and knowledge regarding antibiotics. Furthermore, in the same study, it was reported that Latino people believe antibiotics are effective against viral infection[24]. This study confirms that people still do not have enough knowledge about antibiotics and the outcome of using them inappropriately without prescription.

In some countries, they realized the importance of reducing and prevention of self-medication. They started to dispense exact required tablet quantities in pharmacies, and therefore, patients will not use same medications for further illnesses without prescription. They also enforced laws which prohibited over-the-counter antibiotics and improved awareness through the public to reduce misconceptions of unprescribed antibiotics[25].

Our study also shows that over the counter antibiotics dispensed between different groups which indicates the availability of such practice and the ease to reach it despite the background of each participant.

During the COVID-19 pandemic that we have experienced, a variety of drugs have been usedto treat infected patients, among these drugs were the use of antibiotics. However, they can be misused if no professional counselling has been sought prior to obtaining the antibiotics. A study was done in Saudi Arabia in which 120 pharmacies were surveyed regarding prescribing antibiotics for COVID 19 patients without prescription. 19 pharmacists out of the 120 (15.8%) were convinced to sell non-prescribed antibiotics after various levels of demand by clients.12of the 19 pharmacists did

not offer any advice or counseling regarding the use of the antibiotics[26]. Indicating the importance of this problem even during the pandemic outbreak.

Conclusion and Recommendations

This study showed a significantly high prevalence of over-the-counter antibiotics usage, an alarming phenomenon that needs to be addressed urgently as this could lead to important consequences such as the development of microbial resistance. The study also shows that the most common complaints were upper respiratory tract infections and fever, which most commonly could be viral and self-limiting and could be assessed by primary healthcare physicians.

Over-the-counter use of antibiotics is a crucial issue with many adverse consequences that may not arise shortly but could lead to significant and dramatic adverse effects on the patient and the community in the far end. Thus, we recommend global health education and campaigns to raise awareness within the general population, as well as the continuous advice to seek primary health care physicians or emergency department before taking any self-measures, even if it is as simple as a runny nose. In addition, this study recommends that an increase in constraints on the pharmacies, private hospitals, and clinics regarding the misuse of antibiotics must be urgently applied to limit this phenomenon of antibiotics misuse.

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