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Public Knowledge and Behaviours Regarding Antibiotics Use: A Survey among the General Public

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ABSTRACT

Background: Antimicrobial resistance is associated with increased number of illness, mortality, and health care costs. The incorrect use, excessive prescription and prolonged administration of antibiotics are some factors which allow the growth of resistant bacteria leading to the emergence and spread of bacterial resistance to antibiotics. Several studies about antibiotic use have shown that behaviour towards antibiotics differs among countries, depending on culture, habits, education, and health care organization. The aim of this pilot study was to inspect the attitudes and knowledge regarding antibiotics among the public in Saudi Arabia. ***Methods:*** *A cross-sectional survey using a validated questionnaire was carried out from January to February 2017 within the public, including hospital attendees and patients come for a consultation at the Prince Sattam university hospital. A total of 670 participants were included in this study. They have been chosen using a suitable sampling method. Persons incorporated in this survey who were above 18 years old and familiar with the term "antibiotics".* ***Results:*** *The majority of respondents get informed about the use of antibiotics from Pharmacists (79.94%), and Physicians (76.14%) and 50.3% (n=331) of the respondents reported using antibiotics six months before the survey. Regarding the source of antibiotics, (42.55%) of the respondents usually gets the antibiotics after a consultation with the doctor, while 53.8% declared that their antibiotics were acquired from a retail pharmacy and a few of them (3.65%) get the antibiotics from family and friends. The justification of participants for having antibiotics was mostly due to fever (41.34%) or respiratory infections (22.19%). About 33.5% stated that they did not complete the treatment course and the reason was they felt better. Almost 57% indicated that they had ever kept an antibiotic at home for emergency need while 28.57% use leftover antibiotics in case they needed them again if the same infection recurred. Regarding the knowledge about antibiotics, the highest correct response was antibiotics may cause allergic reactions (82.22%) followed by "antibiotics are used mainly for treating a bacterial infection", as well as "unnecessary use of antibiotics cause bacterial resistance" (69.6% and 69.9 respectively). Regarding antibiotic resistance, knowledge was markedly increased: 66.5% of respondents understood that antibiotic resistance is a health problem worldwide.* ***Conclusion:*** *The results obtained in this survey demonstrate that there is a lot of room for improvement of patient's knowledge and change in their behaviour towards antibiotics. These results may lay a basis for conducting a well-organized, planned, and structured educational program to upgrade the appropriate use of antibiotics by a collaboration of physicians, pharmacists, and the whole health care system.*

Keywords: Antibiotics use, public knowledge, attitudes, resistance

INTRODUCTION

Development of antimicrobial resistance is a significant menace to human health worldwide, which started as soon as the antibiotics were used clinically in 1940. The World Health Organization (WHO) considers antibiotic resistance as one of the main issue which threaten public health in the recent years [1]. Antimicrobial resistance is correlating with increased number of illness, mortality, and health care costs [2,3]. WHO estimated that 25000 people die every year

in the European hospitals as a consequence of antibiotic resistance and with estimated cost of about €1.5 billion yearly [2]. In the USA, Centers for Disease Control and Prevention reported that at least two million people become ill due to antibiotic resistance, and around 23000 people die as a direct cause of these infections every year [3].

The incorrect use, excessive prescription and prolonged administration of antibiotics are some factors which allow the growth of resistant bacteria and the death of the sensitive ones leading to the emergence and spread of bacterial resistance to antibiotics [4-7]. Many countries conducted campaigns to stimulate the public to reduce unnecessary use of antibiotics and advise them that antibiotics are inefficient for coughs and colds [8-11]. Several studies about antibiotic use have shown that behaviour towards antibiotics differs among countries, depending on culture, habits, education, and health care organization [12,13]. Thus, changing habits and increasing awareness of public about antibiotic use is considered as a fundamental early planning to maintain antibiotic potency in the time of growing bacterial resistance.

The aim of this pilot study was to inspect the attitudes and knowledge regarding antibiotics among the public in Saudi Arabia, as a step which could raise the awareness about the antibiotic use and minimize the threats to human health.

METHODS

Study population

A cross-sectional survey using a validated questionnaire was carried out from January to February 2017 within the public, including hospital attendees (members of the patient's family, friends, relatives, and others) and patients come for a consultation at the Prince Sattam university hospital.

A total of 670 participants were included in this study. They have been chosen using a suitable sampling method. Persons incorporated in this survey who were above 18 years old and familiar with the term "antibiotics".

Questionnaire development

The questionnaire was constructed using different surveys and adjusted to suit the local population [14-18]. The questionnaire consisted of four sections. The first part secures the demographic merits of the participants. The second part was designed to show doctors/pharmacists habit and the patient relationship with them and recent antibiotic usage for the past six months. Participants offered two options to answer: "Yes", "No". Participants were asked to give more details about the source of antibiotics, why taking antibiotics? and whether they had treated with antibiotics in the study period. Section 3 of the questionnaire included usage of antibiotics for cold, completion of the treatment course, sharing antibiotic with family and relatives, sparing antibiotic for future need, utilizing unconsumed antibiotics, follow up the instructions attached and can check the expiration date before using antibiotics. Respondents were requested to choose "Yes", "No". Part 4, consisted of many phrases to estimate behaviours of the respondents in respect of antibiotics. Areas evaluated related to the effectiveness of antibiotics, identification, and riskiness of antibiotics (antibiotic resistance, allergic reaction, bacterial flora, and side effects). Participants were asked to select one of the three options given: "Agree", "Disagree" and "No answer". The questionnaire was prepared in English and was then translated into the Arabic language. A small study of 20 subjects selected randomly from the survey site which acts as a guide to assess if the respondents were able to comprehend and answer the given questionnaire. Thus, no additional modifications have been added to the questionnaire before the actual survey.

RESULTS

A total of 670 questionnaires were filled by the public at the Prince Sattam university hospital during the study period. However, 658 (98.2%) of the questionnaires were found complete, and the rest, therefore, were excluded from the analysis.

Table 1 The summary of demographic characteristics

Characteristics		Number (n =658)	Percentage (%)
Age	18-25	273	41.49
	26-35	212	32.22
	36-45	125	19
	>45	48	7.29

Gender	Male	347	52.74
	Female	311	47.26
Marital Status	Single	290	44.07
	Married	368	55.93
Educational level	School	142	21.58
	Diploma	59	8.97
	Bachelor degree	405	61.55
	Postgraduate	52	7.9
Relation to medical field	Yes	111	16.87
	No	547	83.13

Table 2 The public and health care professional relationship and usage of antibiotics

Variables		Number (n=658)	Percentage (%)
Pharmacists tell how antibiotics used	Yes	526	79.94
	No	132	20.06
Physicians inform you how antibiotics should be used	Yes	501	76.14
	No	157	23.86
	Did you use antibiotics for the last six months		
	Yes	331	50.3
	No	327	49.7
Source of antibiotics	Prescribed clinic	280	42.55
	Retail pharmacy with prescription	195	29.64
	Retail pharmacy without prescription	159	24.16
	Family and friends	24	3.65
Reasons for the use of antibiotics	Fever	272	41.34
	Respiratory illness	146	22.19
	Pain/Inflammation	119	18.09
	Urinary tract infection	33	5.02
	Skin infection/wound	31	4.71
	Others	57	8.66

From the results obtained about demographic features in Table 1, the maximum distribution of the respondents was for age group 18-25 who accounted for 41.49%, followed by the age group 26-35 (32.22%), but those above 45 years old were the minimum, who rated for only 7.29% of the total participants. The average age of the participants was 30 years. Among the respondents, males (52.74%) and married (55.93%) groups were the majority. Most of the respondents (61.55%) were at bachelor degree level, and the majority (83.13) had no relation to the medical field.

From the results given in Table 2, the majority of respondents get informed about the use of antibiotics from Pharmacists (79.94%), and Physicians (76.14%) and 50.3% (n=331) of the respondents reported using antibiotics six months before the survey. Regarding the source of antibiotics, (42.55%) of the respondents usually gets the antibiotics after a consultation with the doctor, while 53.8% declared that their antibiotics were acquired from a retail pharmacy with or without a prescription and a few of them (3.65%) get the antibiotics from family and friends. The justification of participants for having antibiotics was mostly due to fever (41.34%) or respiratory infections (22.19%).

Table 3 The respondent's attitudes towards the use of antibiotics

Variables		Number (n=658)	Percentage (%)
Always complete antibiotics even I feel better	Yes	220	33.44
	No	438	66.56
I keep antibiotics at home for emergency need	Yes	283	43
	No	375	57
I use leftover antibiotics for the same cases	Yes	188	28.57
	No	470	71.43
I follow the instructions on the label	Yes	453	68.85
	No	205	31.15
I frequently check the expiry date of antibiotics	Yes	490	74.47
	No	168	25.53

From results shown (Table 3), the majority of respondents (66.56%) reported that they did not finish their last antibiotic course as prescribed. About 33.5% stated that they did not complete the treatment course and the reason was they felt better. Almost 57% indicated that they had ever kept an antibiotic at home for emergency need while 28.57% use leftover antibiotics in case they needed them again if the same infection recurred. The majority of respondents (68.85%) follow the instructions on the label, and 74.47% frequently check the expiry date of antibiotics.

Table 4 The knowledge of respondents regarding antibiotics

Variables		Number (n =658)	Percentage (%)
Different antibiotics are used to cure various diseases	Agree	472	71.73
	No answer	115	17.48
	Disagree	71	10.79
Antibiotics are effective against bacteria	Agree	458	69.6
	No answer	150	22.8
	Disagree	50	7.6
Antibiotics speed up recovery from most cough and cold	Agree	437	66.4
	No answer	131	19.9
	Disagree	90	13.7
Antibiotics are effective against viruses	Agree	398	60.49
	No answer	116	17.63
	Disagree	144	21.88
Antibiotics can imbalance the body's flora	Agree	438	66.57
	No answer	178	27.05
	Disagree	42	6.38
Unnecessary use of antibiotics causes bacterial resistance	Agree	460	69.9
	No answer	101	15.35
	Disagree	97	14.75
Antibiotics can be used to stop the fever	Agree	372	56.54
	No answer	106	16.11
	Disagree	180	27.35
Antibiotics do not cause side effects	Agree	98	14.9
	No answer	133	20.21
	Disagree	427	64.89
Antibiotics may cause allergic reactions	Agree	541	82.22
	Neutral	95	14.44
	Disagree	22	3.34
Resistance to antibiotics is a worldwide problem	Agree	438	66.57
	No answer	176	26.75
	Disagree	51	6.68

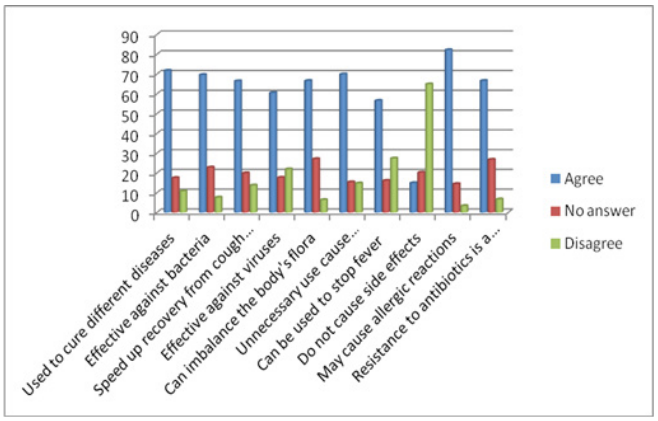

Figure 1 Knowledge of respondents about antibiotics

From the results presented (Table 4 and Figure 1), regarding the knowledge about antibiotics, the highest correct response was antibiotics may cause allergic reactions (82.22%). Followed by "antibiotics are used mainly for

treating a bacterial infection", as well as "unnecessary use of antibiotics cause bacterial resistance" (69.6% and 69.9 respectively). However, 66.40% of respondents incorrectly thought that antibiotics speed up recovery from a cough and colds. In addition, about 60% of them stated that antibiotics are used for the treatment of viral infections. The results indicate that there is a substantial group of the people who believe that antibiotics will be of high value to be utilized for a cough or cold and are therefore still likely to request antibiotics when they have these conditions without consultation. There was a great knowledge insufficiency about both the potential and harmfulness effects of antibiotics. In particular, about 15% of participants did not agree that antibiotics have side effects and 33% did not realize that antibiotics can lead to the decrease in the number of bacterial flora that normally lives in our bodies such as skin and gut. Regarding antibiotic resistance, knowledge was markedly increased: 66.5% of respondents understood that antibiotic resistance is a health problem worldwide.

DISCUSSION

The results have shown that the public participated in this study has less knowledge about the significance of antibiotics in the treatment of viral infections. The 60.5% of respondents believed that antibiotics are effective for viral infections which is less than the surveys conducted in Malaysia (67.2%) [18] and New Jersey (70%) [17]. In contrast, it was higher than results obtained from Britain, Europe, Denver, Wisconsin, and Minnesota (55%) [18-21].

Most of the respondents (66.6%) believe that no need to complete the full course of antibiotic treatment if they feel better which is higher than a study done in Malaysia where 59.8% admitted that they would complete the antibiotic treatment course even they have the sensation of feeling better [18]. In contrast, respondents of other studies had a knowledge of the need to finish the full course of antibiotics even signs of infection are subsiding; such studies were conducted in Hong Kong (58%) [15] and Taiwan (50.1%) [22]. This indicated that the participants might not know the significance of the necessity to complete the full course of the antibiotic regimen.

In our study, 66.4% of participants would have antibiotics for a cold, which is higher than those reported in British and Malaysia communities where 38% of participants agreed that antibiotics could eliminate most cough and cold symptoms [18,19]. But it is much greater than those notified in USA (27%) [14], Hong Kong (17%) [15], and Sydney (3%) [23].

Repeated prescribing of antibiotics for a self-limiting illness such as those caused by viruses, has affected the public concepts about the antibiotic potency for treating these infections [24-26]. Several studies have revealed that antibiotics are more probably prescribed under the pressure of patient's demand and expectations which conclude to dispensable prescribing [26,27]. Moreover, the choice of prescribing antibiotic is also highly determined by the patient-physician relationship, in which the physician would like to fulfil the patient satisfaction and expectations even though he feels that the antibiotics are of no clinical value [26].

Deficient control of the accessibility of antibiotics could participate to some extent in inappropriate antibiotic use in the community. In our study, 53.8% of respondents usually obtain antibiotics from the retail pharmacy with or without prescriptions whereas, a survey conducted in Trinidad and Tobago, one in five of the interviewers got their antibiotics by requesting it from private pharmacies without consultation [16]. In another study in Hong Kong, it was reported that 9% of participants received antibiotics without a prescription [15].

Unnecessary use of leftover antibiotics and using them at need without advice from a clinician may increase antibiotic resistance of normal flora by carrying out a selective pressure in the gut and upper respiratory tract [20,26,27]. In this study, 28.6% showed that they have access to leftover or standby antibiotics and 27% did not know that improper use of antibiotics imbalanced the flora in the human body and therefore increase bacterial resistance to antibiotics.

Healthcare professionals should have their responsibilities towards antibiotic use by increasing the knowledge about the importance of the appropriate use of antibiotics for common infections both of healthcare employees and in the public [27-29].

CONCLUSION

The results obtained in this survey demonstrate that there is a lot of room for improvement of patient's knowledge and change in their behaviour towards antibiotics. These results may lay a basis for conducting a well-organized, planned and structured educational program to upgrade the appropriate use of antibiotics by a collaboration of physicians, pharmacists and the whole health care system.

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