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Compliance with Short-Term Antibiotics in Riyadh, Saudi Arabia

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ABSTRACT

Background: Short-term antibiotics (ST-AB) are commonly prescribed for treating various bacterial infections. However, adherence to ST-AB and the subsequent potential development of microbial resistance are emerging global concerns. In this research, we proposed investigating the aspects associated with commitment to ST-AB in Riyadh, Saudi Arabia. We hypothesized that multiple contributing factors such as level of education, age, and appropriate medical education are positively correlated with adherence to ST-AB.

Method: A cross-sectional study was conducted in Riyadh, Saudi Arabia. An online self-administered questionnaire was provided to assess the research question. Our data were collected from adult and elderly patients who used the ST-AB for six months.

Results: Out of 525 participants surveyed, 393 (75%) were eligible for the research. Around 65% of the participants completed their course of A.B. regardless of their gender, age, or education level. A statistically significant correlation was found between age and completing the antibiotic treatment (p-value = 0.0002). Likewise, a positive correlation was found between gender and completing the antibiotic treatment (p-value = 0.01). Meanwhile, education level has not been shown to improve ST-AB adherence. Finally, the female had a compliance rate of 38.93%, whereas the male had a 25.95% compliance rate.

Conclusion: Regardless of high knowledge of antibiotic resistance, patients have the wrong concept of antibiotics. Therefore, non-compliance with antibiotic treatment was frequent in the community. The primary factor linked to the non-adherence was feeling better of the patient. The findings of our study suggest that adherence to ST-AB requires more A.B. informative patient education.

Key words: Antibiotic treatment, Short-term antibiotics, Patient compliance, Saudi Arabia

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INTRODUCTION

Antibiotics consider the most common medication used worldwide. It is an antimicrobial medication used to fight bacterial infections by killing or inhibiting the growth of the bacteria. Different families of antibiotics have other mechanisms of action; some are classified as bacteriostatic drugs, which arrest and stop bacterial growth and limit the spread of the infection [1–3]. On the other hand, Bactericidal drugstores selectively kill the bacteria through various mechanisms of action p[4]. Antibiotics have undesirable side effects such as G.I. disturbance or CNS-related complications. Such adverse effects are associated with a high rate of non-compliance with antibiotics treatment [5,6]. Antibiotics were frequently prescribed to patients with upper respiratory tract infection (URTI, followed by urinary tract infection at 36.13% and 7.63% of total participants, respectively) [7].

Adherence to antibiotics is a critical aspect of achieving optimal therapeutic benefits. Non-adherence to antibiotics could lead to bacterial resistance and increase the susceptibility to developing bacterial infection resistance [8,9]. Therefore, non-compliance to antibiotics is strongly associated with treatment failure, which may lead to deterioration of individuals' health, increased doctor visits and hospital admission, and

absenteeism of the employees or students [10–13].

Feeling better or forgetting to take the antibiotics accounted for 65% of patients who had not completed the course [14]. Lack of knowledge about antibiotics and educational level were associated with non-adherence behavior [15]. Antibiotic-resistant is being highlighted as an emerging problem developed primarily by the inappropriate use of antibiotics. The devolvement of bacterial-resistant strains may put an extra financial burden on the healthcare system and individuals [16].

This study aimed to investigate and discuss the factors and prevalence associated with antibiotic non-adherence. We hypothesized that multiple contributing factors such as level of education, age, and appropriate medical education are associated with adherence to antibiotics.

METHODS

Study design

A cross-sectional study was undertaken in Riyadh city, the capital of Saudi Arabia.

Study population and sampling

The authors were able to acquire the contact information of people aged 18 years and older through the official government Saudi Telecom database, which clearly explained that the communication with them was purely for scientific purposes. All data on their identities would remain confidential. A systematic random sampling of randomly selected participants from different parts of Riyadh was applied using a computer generating system to ensure it represents the whole city. The sample size was estimated to be 362 with a 95% confidence level and a 5% margin of error.

Study questionnaire

The Survey Monkey program was used to have a more straightforward presentation of the questions to the participant. The researcher first started by calling each participant. Each point of the questionnaire was explained to them to ensure they had excellent comprehension and, therefore, responded accurately. A full explanation was given to each participant in detail (from the purpose of the research, consent to answer the questionnaire, and explanation of the outcome definition).

The study questionnaire was created from other questionnaires and summarized to be more specific to answer the study hypothesis. The questionnaire contained 19 closed-ended questions related to factors potentially affecting adherence to ST-AB., plus eight demographic variables.

Statistical analysis

The collected data was cleaned, entered, and analyzed using Statistical Package for the Social Sciences (SPSS) software version 23. Descriptive statistics (i.e., frequencies, percentages, and measures of central tendency and dispersion where appropriate) were calculated for each item in the survey and all demographic variables. Means with standard deviations (±SD) for continuous variables and proportions for discrete variables were utilized. A P-value less than 0.05 is considered statically significant.

RESULTS

Out of 525 participants surveyed, 393 (75%) were eligible for the research. Table 1 shows the sociodemographic data of the study population.

Table 2 shows a statistically significant correlation between age and completing the antibiotic treatment as directed by prescribers. There was no significant difference between educational levels regarding compliance rates. However, a statistically significant correlation between gender and compliance. Overall, females have a compliance rate of 38.93%, whereas males have a 25.95% compliance rate.

Out of 393 participants (138; 35.11%) did not meet their A.B. course, whereas (255; 64.89%) completed the treatment course. Improvement of the symptoms (22%) was considered the most reported cause of not completing the treatment (Table 3).

Regardless of the participant's educational level, more than half (53.43%) believe antibiotics might treat bacterial and viral infections (Figure 1). Almost two-fifths of the participants (39.19%) did not hear or read about the bacteria resistance of A.B (Figure 2).

DISCUSSION

The prevalence of short-term antibiotic compliance in Saudi Arabia information recourses is limited. Our study shows that the prevalence of short-term antibiotic compliance was moderate at 64.89%. This finding was close to (67.8%) of a previous study conducted in primary care centers in Riyadh [17]. However, the compliance was higher in our study than in the one conducted in Lisbon, Portugal, which shows only 42.3%

Table 1: Demographic data of study population (n=393).

Variable		Numbers
Gander	Male	175(44.53%)
	Female	218 (55.47%)
Age	18-29	230(58.52%)
	30-39	75(19.08%)
	40-54	71(18.07%)
	>55	17(4.33%)
Social status	Single	217(55.22%)
	Married	168(42.75%)
	Divorced	8(2.03%))
Education level	Academic level	281(71.50%)
	High school	77(19.59%)
	Postgraduate	31(7.89%)
	Ungraduated	4(1.02%)
In medical field	Yes	139(35.37%)
	No	254(64.63%)

Table 2: Correlation between age, gender, education level, and compliance with antibiotic treatment N=393 (compliance).

Variable	Completed Treatment (%)	Didn't Complete Treatment (%)	X2	p-value
Age				
18-29	130(33.1)	100(25.4)	19.2	<0.001**
30-39	61(15.5)	14(3.6)		
40-55	50(12.7)	21(5.3)		
>55	14(3.6)	3(0.8)		
Gender				
Male	102(26.0)	73(18.6)	5.52	0.010*
Female	153(38.9)	65(16.5)		
Social Status				
Single	122(31.1)	95(24.2)	15.97	<0.001**
Married	127(32.3)	41(10.4)		
Divorced	6(1.5)	2(0.5)		
Education Level				
Uneducated	2(0.5)	2(0.5)	1.65	0.65
High School	49(12.5)	28(7.1)		
Academic Level	181(46.1)	100(25.4)		
Postgraduate	23(5.9)	8(2.0)		
Health Field				
Yes	88(22.4)	51(13)	0.14	0.71
No	167(42.5)	87(22.1)		
Health Insurance				
Yes	94(23.9)	48(12.2)	0.09	0.76
No	161(41.0)	90(22.9)		
Income				
<3,000	116(29.5)	84(21.4)	8.91	0.03*
3,000-10,000	51(13)	22(5.6)		
10,000-20,000	65(16.5)	25(6.4)		
>20,000	23(5.9)	7(1.7)		
Location				
Riyadh	255(64.9)	138(35.1)	NA	NA
Other	0	0		

Table 3: Reasons that prevented patients from completing their period mentioned for treatment?

	Answer/Cause	
	Yes	No
Feeling better	87(22.14%)	306(77.86%)
Length of the treatment plan	15(3.82%)	378(96.18%)
I take a lot of medication	6(1.53%)	387(98.47%)
I forgot to take the medication	49(12.47%)	344(87.53%)
Times of taking the drug were a lot	21(5.34%)	372(94.66%)
Side effect	15(3.82%)	378(96.18%)
Other	6(1.53%)	387(98.47%)
Completed the course	255(64.89%)	138(35.11%)

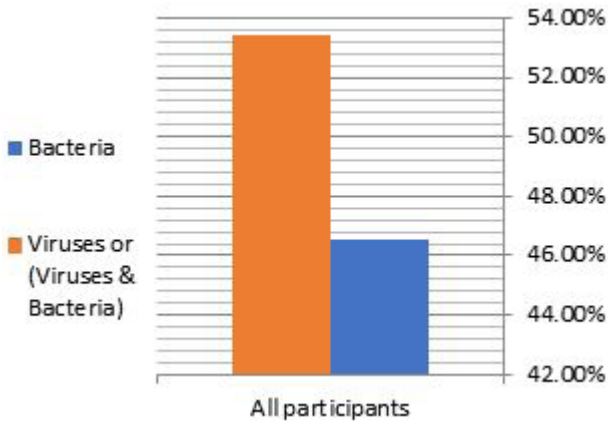

Figure 1: Knowledge of using antibiotics.

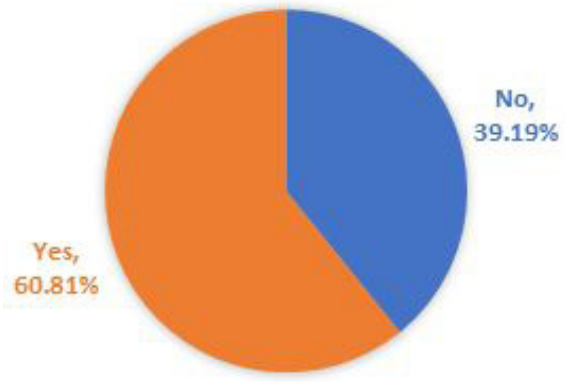

Figure 2: Previous knowledge about antibiotic resistance.

of participants were [18].

Multiple reasons may cause non-compliance to the treatment and course of antibiotics. Feeling better got on the top of the list, followed by forgetting. Length of antibiotics treatment course has been a significant contributor to ST-AB non-compliance in our study, as every additional day gives 28% more chance to be non-compliance [13,17–22]. Inversely, our study showed that only 3.82% of the participants stopped their medication because of the long duration of the course of the treatment, which represents a small number of people whose compliance get affected by the length of the course [18]. Frequent doses for the patient can affect compliance, as those who take three doses are less compliant than patients with one or two doses a day [1,20]. In our study, around 5% of the participants attributed non-adherence to the antibiotics to the frequent times taking them.

Age has been linked to the compliance rate, as increased age was associated with less risk of non-compliance to the course of treatment and less compliance with younger people [13,18]. Inversely, our study's overall compliance rate is the highest among people between 18 and 30 years old (33.08%) and decreases as they age (3.56% for people over 55 years old). There was no significant difference between educational levels regarding compliance rates in our study. However, in another study, a substantial difference has been shown in the knowledge and usage of antibiotics between patients whose educational level is lower than a university degree and whose degree is higher than [15]. It is not surprising that we found a discrepancy in the current study results compared to other studies due to the variation in the variables and disease states experienced by the participants in this study and previous studies. However, most studies have similar factors related to patients' adherence to treatment duration. The less the course and the fewer doses per day, and the absence of side effects that prevent the patient from completing his treatment make the commitment more significant according to the instructions of his treating physician [10,12,14,15,17–27].

There is an essential factor associated with the diagnosis of the disease and its effects on the patient's activity and daily life. There is no doubt that some patients who suffer from acute inflammation of the middle ear affect their daily activity, which increases their eagerness to take antibiotics and other painkillers because of their positive impact on their return to their everyday life. On the other hand, the educational level of the patient and his advanced age increase his awareness of the importance of commitment.

CONCLUSION

Non-compliance with antibiotic treatment was found to be frequent in the community. The primary factor linked to the non-adherence was feeling better of the patient. The findings of our study suggest that adherence to ST-AB requires more A.B. informative patient education.

LIMITATION

We accept that the study adopted a cross-sectional design, and patients asked for recall for used A.B. in the past six months or more. However, this may lead to recall bias due to the long-time interval between using A.B. and filling the survey. Furthermore, we only focus on Short-Term AB excluding the long ones.

AUTHOR CONTRIBUTIONS

All authors participated in the study concept and design, analysis and interpretation of data, drafting and revising the paper, and have seen and approved the final version of the manuscript.

AVAILABILITY OF DATA AND MATERIALS

All data supporting the study findings are contained within this manuscript.

FUNDING

The authors report no funding.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

ETHICAL CONSIDERATION

The institutional review board approved the study at Imam Mohammad Ibn Saud Islamic University (project number 42-2019; approval date, 05 March 2019). All writing is done following the ethical principles of the declaration of Helsinki. A brief description of the study was included with the survey link, with a full explanation on the survey's front page. Participants were told consent was given by filling out the survey. Throughout the study, consent of all participants and data were gathered in complete confidence.

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