



## **Understanding of the Antibiotic Misuse among the General Public of Rafha City of Saudi Arabia**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author BA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SS managed the literature searches and the analyses of the study. Both authors read and approved the final manuscript.*

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### **ABSTRACT**

Antimicrobial or antibiotic resistance has become a leading cause of the death of millions of patients around the globe, including in the Kingdom of Saudi Arabia. Misuse of antibiotics has been identified as one of the main contributing factors to the emergence of antibiotic resistance. Therefore, it is essential to assess the awareness and knowledge of antibiotic misuse among global antibiotic users. The present study aimed to evaluate the awareness and understanding of antibiotic misuse among the people of Rafha city of Saudi Arabia. A questionnaire was used to perform this cross-sectional study, which was carried out from September 2019 to February 2020. The results of this study have revealed that most of the young people discontinue their antibiotic course after symptomatic relief; they are not aware of the antibiotic sensitivity; they do not adhere to the antibiotic schedule, and they prefer readily available cheaper antibiotics. All these significant findings are related to the development of antibiotic resistance. Therefore, there is a need to address these issues to the concerned health care authority of this region. However, further studies that can correlate the cause-effect relationships among the factors and the misuse of the antibiotic are also recommended.

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**Keywords:** Antibiotic misuse; antibiotic resistance; awareness; knowledge; Rafha.

## 1. INTRODUCTION

The discovery of penicillin antibiotics in the 1930s was a breakthrough in antimicrobial therapy. The period starting from the 1950s to 1960s was the golden age of antibiotic development because about 50% of the commonly used antibiotics were discovered during this period [1]. The patent protection of these drugs expired in the early 1980s. This led to the entry of cheaper and more affordable generic medicines in the market. Further, in the period starting from 1990 to 2010, the least number of antibiotics were developed. The low cost and easy access to old antibiotics led to their overuse and misuse, which became one of the significant factors in the development of antibiotic resistance [1-4].

The antimicrobial or antibiotic resistance has become a global problem with the current time, including in the Kingdom of Saudi Arabia. Antibiotic resistance has also become one of the leading causes of the death of millions of patients around the globe [5-7]. Recently, one critical systemic review about antibiotic misuse in the Kingdom of Saudi Arabia has been published [8]. This study states that the over the counter availability of antibiotics to the patients, bypassing the health care system by the patients, and the over prescriptions of antibiotics by the physician are the significant factors that contribute to the antibiotic misuse and ultimately to the antimicrobial resistance in the Kingdom of Saudi Arabia [8]. This study also states that many studies related to the prevalence of antibiotic misuse have been carried out in Riyadh, Jeddah, Alkharj, and Abha [9-14]. Our

literature search also revealed some studies related to the prevalence of antibiotic misuse in the Kingdom of Saudi Arabia [15-19]. It is essential to identify the awareness of antibiotic misuse among global antibiotic users, including among the antibiotic users in the Kingdom of Saudi Arabia. These studies help us to provide some fruitful suggestions to the health care authorities to make strategies to control antibiotic misuse. Therefore, it was decided to assess the awareness and knowledge of antibiotic misuse among the people of Rafha city of Saudi Arabia.

## 2. METHODOLOGY

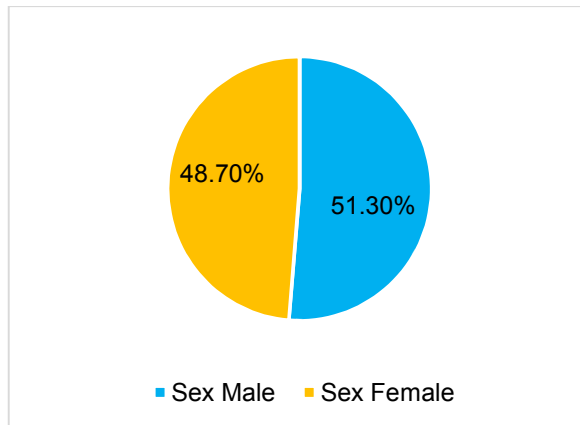
This was a cross-sectional study, which was carried out from September 2019 to February 2020, among the general population Rafha city of Saudi Arabia, to achieve a sample size of more than 400 participants. The questionnaire was prepared in light of the existing literature mentioned in the introductory part of this article. The contents of the questionnaire are understandable from the result and discussion part of this study. The participants of < 18 years of age were excluded from the study. The participants were informed about the contents of the questionnaire and were asked to sign the written consent. The questionnaire was given to the participants at the place of their choice. Being a cross-sectional study, it did not require approval from the University Review Board.

## 3. RESULTS AND DISCUSSION

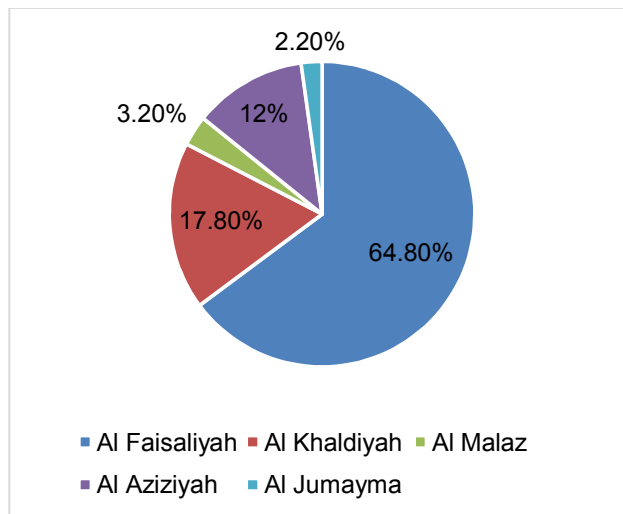
A total of 409 people participated in the study. The socio-demographic characteristic of the participants is provided in Table 1.

**Table 1. The socio-demographic characteristic of the participants (N = 409)**

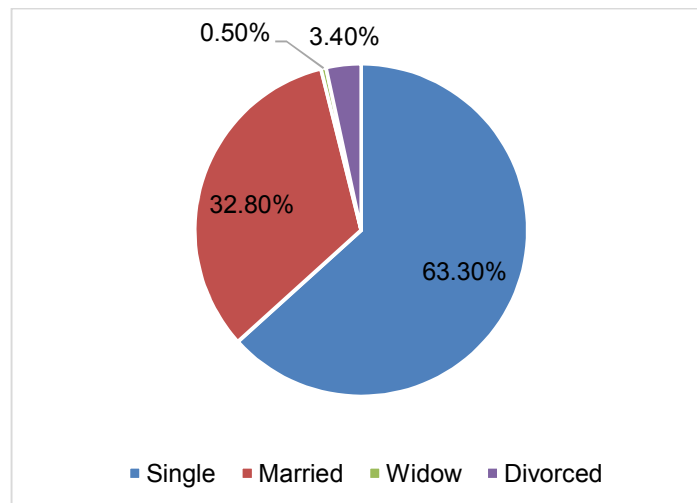
Variable	Categories	Frequency	Percentage (%)
<b>Sex</b>	Male	210	51.3
	Female	199	48.7
<b>City Area</b>	Al Faisaliyah	265	64.8
	Al Khaldiyyah	73	17.8
	Al Malaz	13	3.2
	Al Aziziyah	49	12
	Al Jumayma	9	2.2
<b>Social Status</b>	Single	259	63.3
	Married	134	32.8
	Widow	2	0.5
	Divorced	14	3.4



**Fig. 1. Gender of the participants (N = 409)**



**Fig. 2. City area of the participants (N = 409)**



**Fig. 3. Social status of the participants (N = 409)**

The socio-demographic characteristic of the participants revealed that males (51.3%) and females (48.3%) participated equally in the study. The majority of the participants from the Al Faisaliyah area (64.8%), Al Khaldiyah area (17.8), and Al Aziziyah area (12%) of the Rafha city. Most of the participants were unmarried (63.3%). The age of the unmarried participants ranged from 18 years to 30 years. This means that this study mainly concerns with young people of the studied population.

Table 2 provides information about the awareness among participants about the usage and misuse of antibiotics.

The awareness related data of Table 2 revealed that about 50% of the participants get antibiotics through a doctor's prescription; about 30.6% make use of previous antibiotic prescription, which indicates a high possibility of self-medication; and about 19.3% get antibiotic from the community pharmacy. It was also observed

that only about 30% of the participants complete their antibiotic course, while another 70% may not achieve their antibiotic course. This finding, is an important finding among the participants as not completing the antibiotic course, is one of the factors in the development of antibiotic resistance [8,19].

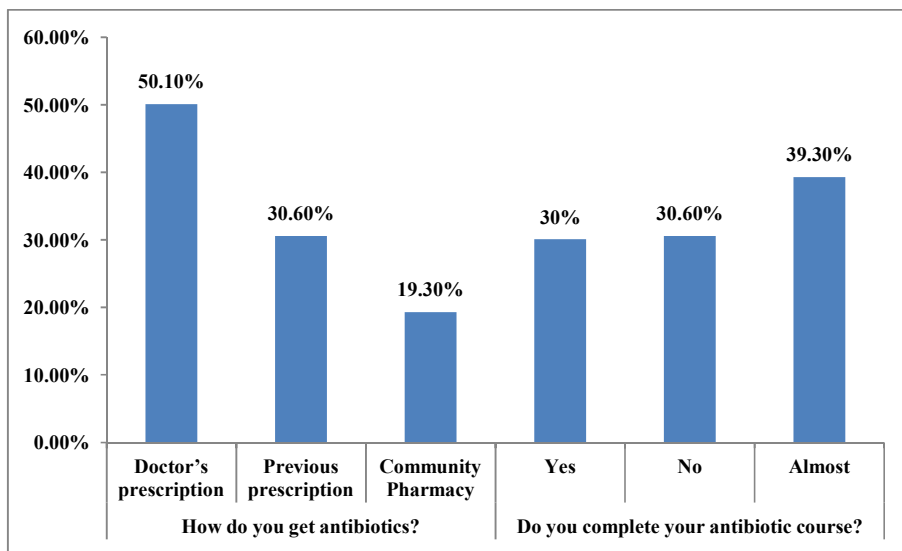
Table 3 provides information about the knowledge and beliefs about antibiotics among the participants.

The data of table 3 indicate that about 90.5% of the participants are not aware of the antibiotic sensitivity test, which is another important finding of this study. It is also observed that about 73.3% of participants do not adhere to the medication time, which may also affect the clinical effects of the antibiotics [8,19].

Table 4 provides information about the effect of the price on the selection of the antibiotic.

**Table 2. Practices among participants about usage and misuse of antibiotics (N = 409)**

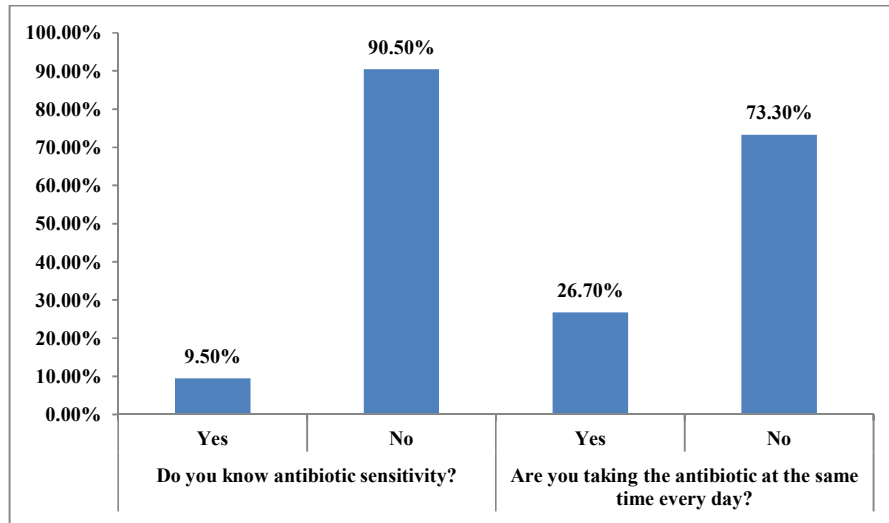
Variable	Categories	Frequency	Percentage (%)
How do you get antibiotics?	Doctor's prescription	205	50.1
	Previous prescription	125	30.6
	Community Pharmacy	79	19.3
Do you complete your antibiotic course?	Yes	123	30.1
	No	125	30.6
	Almost	161	39.3



**Fig. 4. Practices among participants about usage and misuse of antibiotics (N = 409)**

**Table 3. Knowledge and beliefs about the antibiotics among the participants (N = 409)**

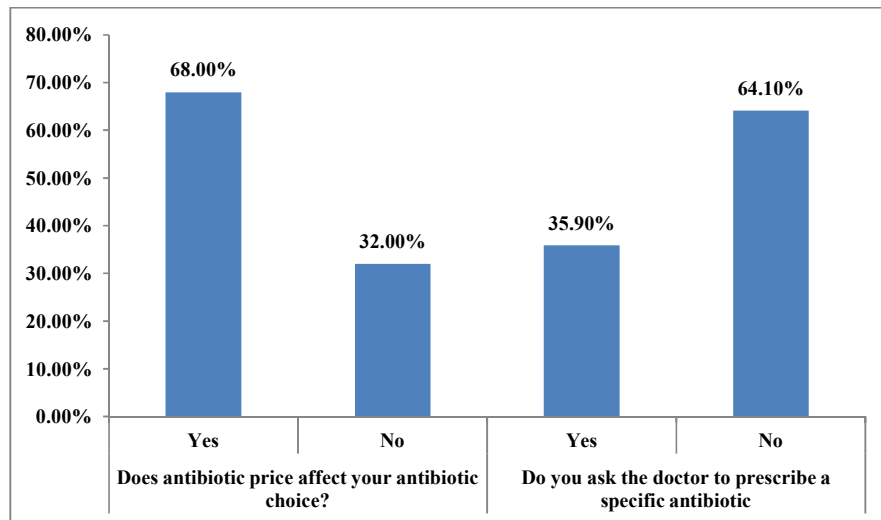
Variable	Categories	Frequency	Percentage (%)
Do you know antibiotic sensitivity test?	Yes	39	9.5
	No	370	90.5
Are you taking the antibiotic at the same time every day?	Yes	109	26.7
	No	300	73.3



**Fig. 5. Knowledge and beliefs about the antibiotics among the participants (N = 409)**

**Table 4. Effect of the price of the selection of the antibiotic (N = 409)**

Variable	Categories	Frequency	Percentage (%)
Does antibiotic price affect your antibiotic choice?	Yes	278	68
	No	131	32
Do you ask the doctor to prescribe a specific antibiotic	Yes	147	35.9
	No	262	64.1



**Fig. 6. Effect of the price of the selection of the antibiotic (N = 409)**

The data of Table 4 reveal that the choice of antibiotics depends on its price. About 68% of the participants were concerned about the cost of the antibiotic. It is worthy of mentioning here that lower prices and easy access to antibiotics to the patients increase the misuse of antibiotics [8,19].

Table 5 provides information about the antibiotic dosage forms preferred by participants.

The data of Table 5 indicate that the majority of participants prefer the capsule dosage form of antibiotics (47.9%), which is followed by the tablet dosage form (25.2%). The capsule dosage form might have been preferred because of the

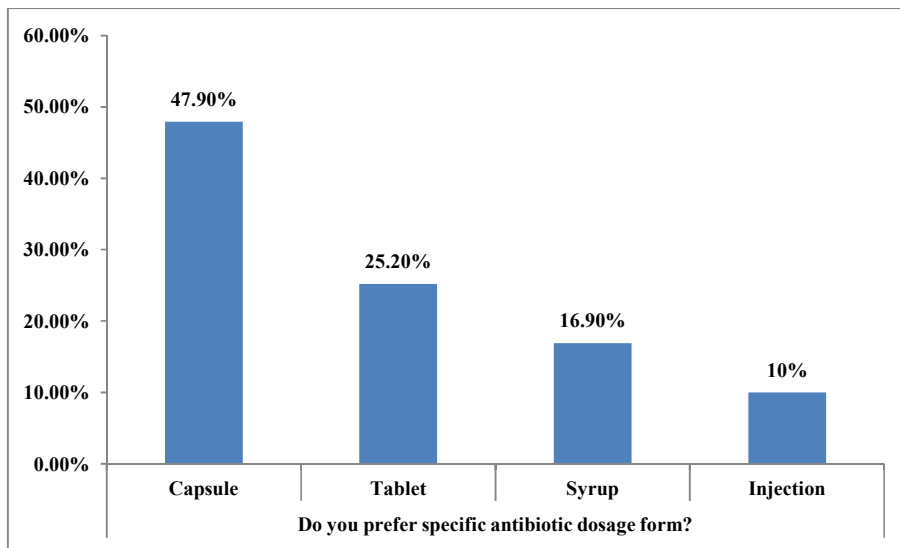
palatability problems, for example, bitter taste, associated with many antibiotics [19-21].

Table 6 provides information about the reason for using antibiotics by the participants.

The data of Table 6 demonstrate that most of the participants use antibiotics during fever and oral/chest pain. It has also been observed that about 56% of participants do not continue the antibiotic course after symptomatic relief. This is a noteworthy finding, and it may lead to delay in the proper treatment as well as antibiotic resistance in the long run [8,19].

**Table 5. Antibiotic dosage forms preferred by participants (N = 409)**

Variable	Categories	Frequency	Percentage (%)
<b>Do you prefer a specific antibiotic dosage form?</b>	Capsule	196	47.9
	Tablet	103	25.2
	Syrup	69	16.9
	Injection	41	10



**Fig. 7. Antibiotic dosage forms preferred by participants (N = 409)**

**Table 6. The reason for using the antibiotics by the participants (N = 409)**

Variable	Categories	Frequency	Percentage (%)
<b>When do you use antibiotics?</b>	Fever	145	35.5
	Oral / Chest Pain	201	49.1
	Flu	63	15.4
<b>Do you continue the antibiotic course after recovery from symptoms?</b>	Yes	180	44
	No	229	56

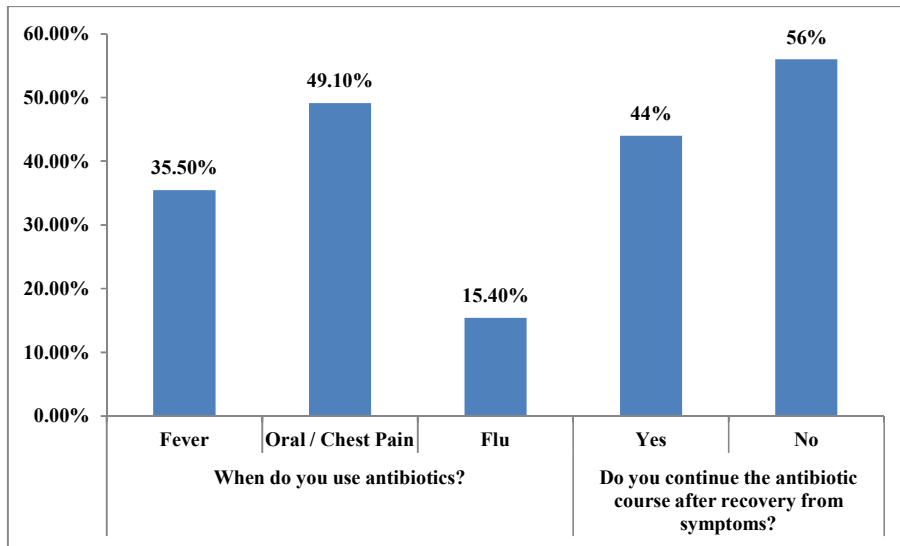


Fig. 8. The reason for using the antibiotics by the participants (N = 409)

#### 4. CONCLUSION

The misuse of antibiotics is related to the development of antibiotic resistance. This study has revealed that most of the young people of Rafha city of Saudi Arabia discontinue their antibiotic course after symptomatic relief; they are not aware of the antibiotic sensitivity; they do not adhere to the antibiotic schedule, and they prefer readily available cheaper antibiotics. All these significant findings are related to the development of antibiotic resistance. Therefore, there is a need to address these issues to the concerned health care authority of this region.

#### 5. LIMITATIONS OF THE STUDY

The small sample size of the studied population was mainly confined to the Rafha city of Saudi Arabia, which cannot be generalized to the whole population of Saudi Arabia. Being a cross-sectional study, it cannot relate to cause-effect relationships among the factors and the misuse of the antibiotic. Therefore, further studies that can correlate the cause-effect relationships among the elements and the misuse of the antibiotic are recommended.

#### CONSENT

As per University Standard Guideline participant's consent has been collected and preserved by the authors.

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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