

## Original Research Article



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## KNOWLEDGE AND AWARENESS OF ANTIBIOTIC RESISTANCE AMONG PARENTS IN TAIF, KSA, CROSS SECTIONAL STUDY

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### ABSTRACT

**Background:** Antibiotic resistance (AR) has become a major public health problem globally and locally, especially in Saudi Arabia. It is potentially related to the misuse and overuse of antibiotics. Many Saudi studies showed a high prevalence of inappropriate use of antibiotics. Our objective is to assess the knowledge and awareness of antibiotic resistance among parents in Taif Governorate, KSA.

**Methodology:** This is a cross-sectional online study was conducted in Taif city, Saudi Arabia. A sample of Saudi parents who live in Taif were collected during the period from October 2018 to March 2019. A validated WHO questionnaire of the survey called “Antibiotic resistance: multi-country public awareness.” Was embedded on Google forms and electronically distributed through WhatsApp.

**Results:** A total of 732 participants, of which 70.2% were female. 71.3% have a bachelor's degree. Most of the participants, 34.3% were between 35-44 years old. A high number of participants (73.1%) were familiar about AR, while 26.9% of them weren't aware. Among the participants, 31.2% heard about AR as a term through the media, while 21.1% and 20% of them heard about it from doctors and a family member, or a friend, respectively. Most of the participants answered correctly five out of seven questions related to AR.

**Conclusion:** Parents showed a good level of knowledge and perception toward AR, suggesting that they realize the impact of AR on their children's health and the consequences of this issue arising from the misuse of antibiotics.

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## INTRODUCTION

Antibiotic resistance (AR) is a global health issue related to the misuse and overuse of antibiotics, which leads to the development of antibiotic resistance [1,2]. Antibiotics represent therapeutic predicament for doctors, warnings have long been made about the consequences of using them irresponsibly. Still, the problem kept growing because of people's lack of interest without a severe decision to reduce the use of antibiotics, which will hasten the transition of the healthcare climate into a post-resistance phase, where there spread of infection and simple diseases with no treatment.[3] The risk of AR in people, is that resistance has been noted in the causative organisms of many serious infectious diseases like pneumonia and diarrhea. The risk is not limited to humans; it also includes increased financial burden through prolonged hospital stays and not responding to medication.[4] Many reasons cause AR; one of them is health worker practice. Through the misuse of antibiotics in the treatment of upper respiratory tract infection, acute watery diarrhea, and the common cold, which more often have a viral etiology. [5,6] For example, prescribing antibiotics for children suffering from common cold with persistent symptoms for fewer than seven days, while even less than half of them had their temperature objectively measured. This indicates a mismatch between knowledge of information and the application of it in the practice of a health worker. [7] Some reasons are related to pharmacies and systems. Antibiotics can be purchased over-the-counter at pharmacies without a prescription from a doctor in many countries. [8] 77.6% of pharmacies dispensed medicines without a prescription primarily to treat scenarios consistent with viral infections, as

found in a Saudi study. [9] It is essential to have a strategic plan for combating antibiotic resistance, by educating the community about the importance of appropriate antimicrobials use and infection prevention and control [10]. Also, there are reasons related to patient beliefs and practices in the use of antibiotics, as discussed by a research in Riyadh that aimed to explain why people buy antibiotics without a prescription, and that is due to two main reasons, The first is their previous experience in the use of antibiotics and their belief that it is the best solution for treating disease. The second reason is the tips of friends or family that have used it. [11] In Yemen, Saudi Arabia, and Uzbekistan, the percentage of adults who use antibiotics is very high. Yet, they do not complete the course of treatment, and this stimulates the occurrence of AR. Therefore, it was necessary to intervene in educating health workers and the public and work to regulate the ban on the sale of antibiotics without prescription. [12] A large percentage of Saudi patients did not complete the course of AB that lead to AR. [13]

Several studies have assessed the awareness of AR. One of them in Italy among university students. Where 94% of the students knew what AR means. They were aware that taking antibiotics with prescriptions is one of the ways to reduce its occurrence. [14] Another study during 2016-2017, people's knowledge of antibiotic resistance in Riyadh assessed in any other person; they found not enough information and awareness about AR. [15] WHO surveyed antibiotic resistance awareness and knowledge of the proper use of antibiotics in many countries in 2015. [16] The study did not include Saudi Arabia. We aim to do a similar part of the survey in Saudi Arabia, especially in Taif Governorate among parents. The objective of current study was to

evaluate the awareness and knowledge of antibiotic resistance among parents in Taif Governorate, KSA.

## MATERIAL AND METHODS

### Ethical approval

The research proposal was reviewed and approved by the Taif University Research Ethics Committee. Permission gained from the Administration of the College of Medicine before starting the study. The students who participated in the study given a brief overview of the nature of the study. They assured their responses, and data would be confidential. After taking informed consent, data were treated confidentially during all stages of the research.

### Study design

This is an exploratory cross-sectional based study conducted in Taif city, Saudi Arabia; carried out from October 2018 to March 2019. Participants selected by using a quantitative convenience sampling method to assess the parents level of knowledge toward antibiotic resistant. Electronic distribution of the questionnaire via social media applications has been used as it considered the best available method to achieve the aim of this study. It included Saudi parents who lived in Taif city and their aged 18 and above who were not Saudi, aged less than 18, or did not agree to be a part of the study were excluded. A total of 732 participants calculated as sample size with a confidence interval of 95% and a margin of error of 5 %.

### Instrument

The data was collected by using a standardized validated WHO questionnaire titled "Antibiotic resistance: multi-country public awareness survey" that was translated into Arabic by proficient speakers with some modifications to be suitable to the general population. The questionnaire included three

**Table 1: Demographic data**

Characteristics	Number (N=732)	Percent (%)
<b>Gender</b>		
Male	218	29.8%
Female	514	70.2%
<b>Age (year)</b>		
18-24	93	12.7%
25-34	190	26%
35-44	251	34.3%
≥45	198	27%
<b>Educational level</b>		
Illiterate	9	1.2%
Less than college	138	18.9%
Bachelor's degree	522	71.3%
Master's/Ph.D	63	8.6%
<b>Monthly income</b>		
<10000	225	30.7%
10000-15000	287	39.2%
>15000	220	30.1%

sections — the first contained socio-demographic information of participants. The second section contained closed-ended questions about the awareness of the term AR with the identification of how they are familiar with it. The third section included seven statements with multiple-choice, true/false/I do not know to evaluate the level of knowledge about AR. The questionnaire embedded on Google forms and electronically distributed through WhatsApp.

### Data analysis

The collected data entered and coded into the Statistical Package for Social Sciences (SPSS version 21). The descriptive statistical analysis in SPSS used to represent demographic data by frequencies and percentages. A chi-square test used to find out if there is a statistical difference. Also, Microsoft Excel 2017 was used to represent the data by bar graph.

## RESULT

Total of 732 participants, their demographics

**Table 2:** Shows if respondents recognize the term of antibiotic resistant.

Gender	Male	Female	Total
	Number (%)	Number (%)	N=732
Yes	138 (63.3%)	397(77.2%)	535(73.1%)
No	80 (36.7%)	117(22.8%)	197(26.9%)

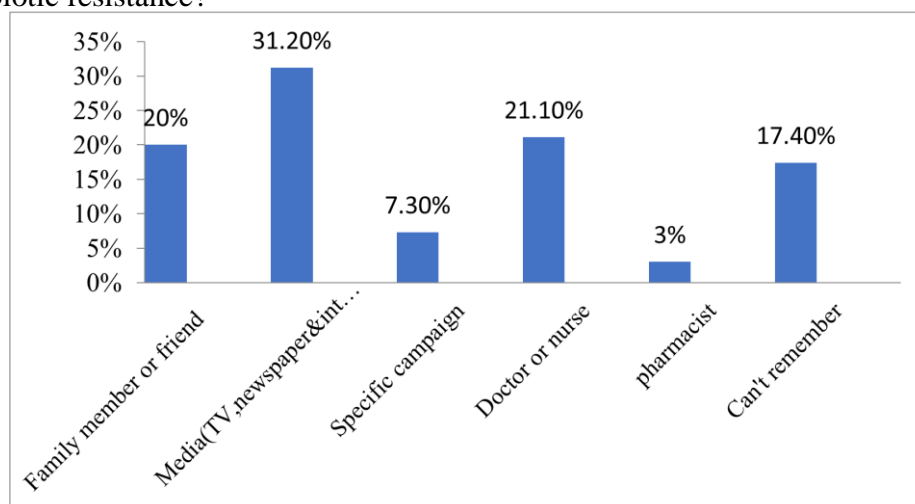
shown in (Table 1) among them (29.8%) were males, and the majority of participants were female (70.2%) and (34.3%) of them aged between 35-44 years old. The most of them were educated except for (1.2%) were illiterate. Table 2 showed a high number of participants (73.1%) were aware of the term antibiotic-resistant while (26.9%) of them were not aware of the term. Those who answered " yes" they were aware of the term antibiotic resistance were asked from which sources they heard about it. The largest number of respondents (31.2%) heard it from the media including TV, radio & newspaper while (21.1%) of them heard from their healthcare workers, followed by (20%) who

heard about it from a family member or friend as it showed in (Figure 1).

In order to determine the level of awareness regarding the topic of antibiotic resistance, the participants had to answer seven related statements regarding antibiotic resistance with a true or false or I do not know answer as it presented in (Figure 2). Table 3 showed that the majority of participants have correctly responded to five out of seven statements, (56%) of the parents agreed that many infections are becoming increasingly resistant to antibiotics and (42.8%) of them agreed that the infection would have difficulty responding to treatment. As a result, it showed risks for some medical procedures, such as surgery, organ transplants, and cancer treatment (58.5%). Most of the parents (74.3%) believe that antibiotic resistance is an issue, and they

believed that it could affect them and their families. Regarding this statement, "Bacteria which are resistant to antibiotics can be spread from person to person "(41.3%) of respondents, they don't know the answer, however, only (32.7%) of them answered

**Figure 1.** Percentages of responses from all respondents to “Where did you hear about the term antibiotic resistance?”



**Table 3:** Represent percentage of response to statements to determine the level of knowledge about antibiotic resistance

Statements	Answer Correctly	ANSWER Not Correctly	ANSWER Don't Know	P value			
				Gender	Educational level	Age	Income
1- Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well.	72(9.8%)	450(61.5%)	210(28.7%)	0.372	0.124	0.259	0.451
2- Many infections are becoming increasingly resistant to treatment by antibiotics.	410(56%)	103(14.1%)	219(29.9%)	0.312	0.939	0.295	0.147
3- if bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause.	313(42.8%)	197(26.9%)	222(30.3%)	0.709	0.102	0.164	0.152
4- Antibiotic resistance is an issue that could affect me or my family.	544(74.3%)	40(5.5%)	148(20.2%)	0.522	0.110	0.152	0.138
5- Antibiotic resistance is an issue in other countries but not here.	138(18.9%)	338(46.2%)	256(35%)	0.058	0.060	0.081	0.405
6- Bacteria which are resistant to antibiotics can be spread from person to person.	239(32.7%)	191(26.1%)	302(41.3%)	0.086	0.713	0.586	0.801
7- Antibiotic-resistant infections could make medical procedures like surgery, organ transplants and cancer treatment much more dangerous.	428(58.5%)	33(4.5%)	271(37%)	0.210	0.771	0.192	0.485

correctly.

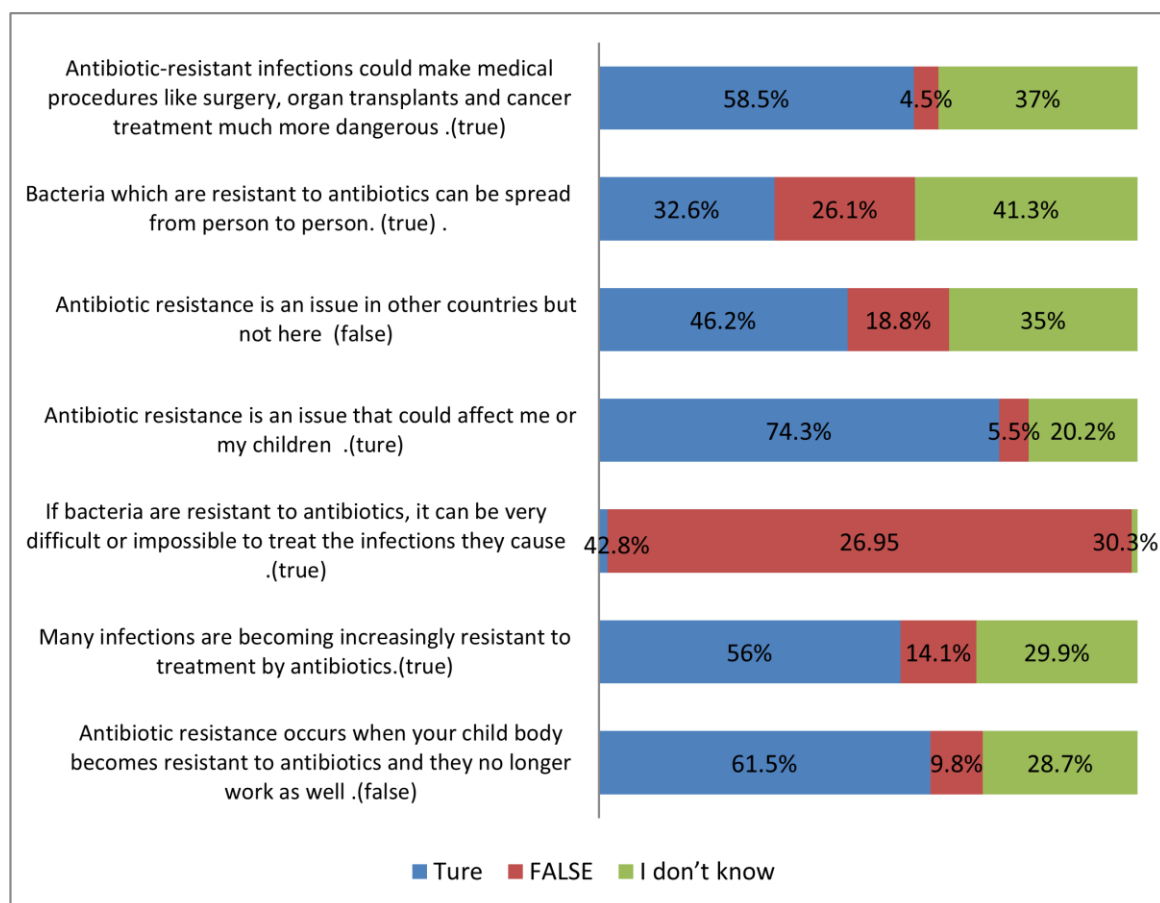
On the other hand, there were two statements that were answered incorrectly by most of the parents, (46.2%) of them thought that antibiotic-resistant is an issue in other cities but not in Taif city and the most misunderstood statement was “Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well”: only (9.8%) of participants

correctly disagreed .While (61.5%) agreed regarding this statement. However, all the statements showed no significant statistical differences based on gender, age, educational level, and monthly income.

## DISCUSSION

The misuse of antibiotics leads to the high potential development of AR that becomes a major public health problem globally and

**Figure 2.** Percentage of responses to statements to determine knowledge about antibiotic resistance.



locally, especially in Saudi Arabia. A systematic review of Saudi published studies regarding misuse of antibiotics demonstrated a high prevalence of antibiotic misuse ranging from 41%-92% among the Saudi population, especially the children [17]. A study involved parents from various cities in Saudi Arabia found that parent's knowledge and attitude on antibiotic use as being inadequate [18]. The main finding in the current study shows that most of the parents are familiar with the term "antibiotic resistance", (31.20%) of parents heard about the term of AR from media including (internet, TV, radio.). These findings are consistent with a study conducted in Libya to assess the source of mother's

antibiotics information 50% of the mothers used the Internet for searching about antibiotics information while 50% of them from healthcare professionals [19], however in the present study (21.1%) and (3%) heard from doctor, nurse or pharmacist respectively. We believe that healthcare professionals play an important role in the dissemination of knowledge about antibiotic use. Also, we assume that the media's lack of accuracy and reliability might lead to misconceptions. This finding corresponds with a qualitative interview study done in the UK, where 100% of parents have heard about antibiotic resistance, but they had difficulty explaining the meaning. [20] Also, our results are

consistent with findings in the UK where despite parents knowing the term, they still believed that antibiotics would accelerate the recovery period of flu-like symptoms, and that suggests they are not clear on the definition. [21] The least of the references is the pharmacist (3%) and awareness campaigns (7%). When compared to the aforementioned British study, it also did not show that awareness campaigns are beneficial, despite their availability. [20] Overall, our study has found a higher level of awareness about antibiotic resistance, when compared to earlier studies conducted in Saudi Arabia. [13,15] Five out of seven statements recognized correctly by parents that means they realize the impact of AR on their children's health and the consequences of this issue arising from the misuse of antibiotics. According to the demographic data, the majority of the participating parents have a bachelor's degree, are young, and are females, which considered a representative group for understandable reasons. First, mothers have deemed the primary caregivers in Saudi society and are more concerned about their children's health than fathers. Second, young parents are more likely to have young children, who are at a higher risk of antibiotic misuse. [14,20] The high level of education associated with good awareness about AR. this result match those observed in earlier studies performed in Saudi Arabia and Italy. [13,14] This indicates that there is a correlation between the low level of education and inappropriate use of antibiotics, as suggested by a study conducted in Yemen, Saudi Arabia, and Uzbekistan. [12] However, in the present study, there is no significant statistical difference based on gender, age, educational level, and income with the level of awareness toward AR. Two prevalent misconceptions that the survey reveals first is

that antibiotic-resistance has no effect on the body, only (9.8%) agreed. In contrast, a large part of respondents (61.5%) disagreed with this statement and that similar to studies conducted by WHO in multi countries and Italy, they believed the report not carefully read by the participants. [14,16] Second is that (46.2%) considered antibiotic resistance is a problem in other countries but not a problem in Taif. We assume that because most of the population consumes information from the internet and social media that is why they believe it is a global problem rather than being a local issue in their city.

### **LIMITATION**

The main limitations of this study is the disproportionate representation of fathers in the sample. The current study cannot be generalized because it conducted in one region of Saudi Arabia, and the use of convenience sampling introduced selection bias because most of the respondents included in this survey were individuals who have access to the internet and WhatsApp only.

### **CONCLUSION**

parents showed a good level of knowledge and perception toward AR that means they realized the impact of AR on their children's health and the consequences of this issue arising from the misuse of antibiotics.

### **RECOMMENDATIONS**

Inappropriate use of antibiotics should not only be blamed on the parents or the patients alone. The Ministry of Health must strictly implement a policy of prohibiting the sale of medicines without prescription and further enforcing it by giving mandatory seminars for doctors and pharmacists to clarify the proper indications for the order of antibiotics and the

consequences of dispensing them irresponsibly. While also raising awareness through social media to educate the public and spread accurate, evidence-based information regarding antibiotic resistance and misuse.

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