

# Use and Abuse of Antibiotics in Dentistry in Saudi Arabia from the Perspective of Dentists

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**Abstract— Background:** Antibiotics are the most commonly used therapeutic interventions in dentistry, but they are risky if not managed properly by dentists and patients. We aimed to evaluate the use and abuse of antibiotics in dentistry in Saudi Arabia from dentists' perspective. **Method:** The researchers developed a cross-sectional survey with a validated, self-administered questionnaire administered from September to December 2019, to 105 dentists from government and private health facilities in Jeddah, Saudi Arabia. **Results:** Antibiotics were prescribed by 95.24% of respondents to their patients. Amoxicillin was the most common antibiotic prescribed, and 95.24% of respondents obtained full medical and allergy history before prescribing antibiotics. About 35.24% respondents were abused/attacked for refusing to prescribe antibiotics to patients, while 80.00% requested patients to keep antibiotics in their homes. Prophylactic antibiotics were prescribed for surgical procedures by 44.76% respondents, and 53.33% respondents deemed it necessary to use antibiotics post-extraction; others (41.90%) rarely prescribed antibiotics for dental infections. According to 80.95% respondents, patients stopped using antibiotics on their own after symptomatic relief, and 56.19% indicated that patients discussed usage instructions with them before consumption. Several respondents (92.38%) advised and educated the patients to complete the antibiotic dosage to ensure effectiveness, and 68.57% reported that patients frequently responded to this guidance. **Conclusion:** All dentists must follow the guidelines and therapeutic protocols regarding the use of antibiotics and not overuse them. Furthermore, adequate information must be provided to the patients about the complications of excessive use of antibiotics or failure to complete the prescribed dosage.

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## 1 INTRODUCTION

Teeth are plagued by many complications, particularly infections, which require a dental consultation for prescription of suitable antibiotics, according to the type of inflammation. Dentists may prescribe antibiotics as procedural or preventive interventions, to reduce inflammation and its dental-related complications. Therefore, the management of oral and dental infections with antibiotics is very important for dental professionals.[1] Antibiotics are important in reducing the recovery time and the risks associated with the complications resulting from oral and dental issues. They are also important in limiting systematic involvement and the spread of infections to adjacent anatomical spaces.[2] Thus, antibiotics have become the most commonly used therapeutic interventions in dentistry; however, they carry significant risks if not properly managed by dentists and patients alike.[3] According to Dar-Odeh et al.,[1] 7-11% of dentists prescribe the most common antibiotics, including metronidazole, clindamycin, tetracycline, macrolides, and betalactams.

Roy and Bagg[4] argued that the main problem in the guidance of antibiotic use in dentistry is that it relies on the personal experience of dentists without evidence-based medicine or the effectiveness of antibiotics according to the specific

situation. Al-Johani et al.[5] agreed that the reliance of dentists on their personal experiences while prescribing antibiotics has led to reduced overall adherence to professional guidelines, which has resulted in the development of antibiotic resistance in many patients. This indicated that the antibiotic prescription method by dentists was faulty, because it varied from one dentist to another, and clearly showed an inconsistency in the antibiotic prescription patterns among dentists. The problem of antimicrobial resistance has become a major issue for researchers and practitioners, the causes of which may vary from social factors to the health beliefs of patients and their families, or could be the result of a lack of knowledge among dentists, especially evidence-based knowledge.[1] Many dental infections can be managed effectively only through surgical interventions, without using antibiotics. However, most dentists rely on antibiotics, especially in outpatient clinics, making it necessary for them to have evidence-based knowledge of antibiotic use.[6]

Spittle et al.[7] emphasized the importance of training dentists on the prevention of risks and misuse of antibiotics with an evidence-based dental approach that ensures dentists are informed of recent trends in dental care and the safe use of

antibiotics. Vanka et al.[8] stressed the importance of the use of antibiotics in dentistry and its inevitable use, but also emphasized that the usage must be within safe limits that ensure high levels of effectiveness and avoid risks for patients. This requires the dentist to provide health education to the patient and his/her family on the use of antibiotics and ensure that the patient does not stop usage before completion of the dose, or exceed the specified dose, in cases of increased pain or inflammation. The dentist should not prescribe antibiotics over the phone and must warn the patient of the risks of antibiotic use, and its effect on increasing antimicrobial resistance, which decreases its effectiveness in the patient. The patient's condition should be examined as a unique condition, and the most appropriate antibiotic should be prescribed in doses suitable for the patient.

In Saudi Arabia, the government and the Saudi Ministry of Health have taken many measures and decisions to prevent misuse, and dispensing an antibiotic without a prescription is illegal and punishable by law. However, many patients still use antibiotics without a prescription from a competent physician.[9] Similar to Jordan, Kuwait, and the UAE, the use of antibiotics in Saudi Arabia's healthcare system increased by 48%, thereby increasing the risk of antibiotic-resistant bacteria. This is one of the problems affecting the efficacy of health care in the Middle East.[10]

## 2 MATERIALS AND METHODS

The researchers developed a cross-sectional survey with a validated, self-administered questionnaire, administered from September to December 2019, to 105 dentists from government and private health facilities in Jeddah, Saudi Arabia. The study subject was the variable use and misuse of antibiotics in dental care, without other dental interventions. The aim of the study was explained to the respondents and verbal consents were obtained before filling out the questionnaire, as per the requirements of the ethics committee. The questionnaire was developed by reviewing other questionnaires used in previous studies. They are available in English and Arabic. The questionnaire consisted of three parts: the first part was an introduction to the questionnaire and included the commitment of the researchers and ethical considerations; the second part was the demographic data and consisted of seven closed-ended questions; and the third part was the extent of use or abuse of antibiotics and consisted of 17 closed-ended questions. Frequencies, and percentages, were used to find the results of the collected data. Statistical analyses were carried out using Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, version 20.0).

## 3 RESULTS

### 3.1 Demographic characteristics of the study sample:

Demographic data in the questionnaire, received from the research sample, were analyzed. Different statistical methods were used to describe the sample of the research and determine its nature through the general information contained in the questionnaire, enabling the classification of the individuals

in the research sample.

### 3.2 Sex

Table 1 shows the percentage of females and males who participated in the study (73.33% and 26.67%, respectively).

TABLE 1.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO SEX

Sex	Frequency	Percentage
Female	77	73.33%
Male	28	26.67%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.3 Age

Table 2 shows the distribution of the participants according to age groups, with the highest number of participants in the 31-35 years group (38.10%), followed by 21-30 years (31.43%), 36-40 years (15.24%), and >40 years (15.24%).

TABLE 2.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO AGE

Age (years)	Frequency	Percentage
21-30	33	31.43%
31-35	40	38.10%
36-40	16	15.24%
>40	16	15.24%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.4 Location of dental degree acquisition:

Table 3 shows the distribution of participants based on where their dental degree was acquired; most participants were from a governmental dental school (77.14%), followed by private dental schools (22.86%).

TABLE 3.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE LOCATION OF DENTAL DEGREE ACQUISITION

Location of acquiring dental degree	Frequency	Percentage
Government dental school	81	77.14%
Private dental school	24	22.86%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.5 International location of dental degree acquisition:

Table 4 shows the distribution of participants according to the international location of dental degree acquisition; most participants were from Saudi Arabia (62.86%), followed by other Arab countries (23.81%), the USA (6.67%), and Europe (5.71%), while Asia accounted for only 0.95%.

TABLE 4.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO INTERNATIONAL LOCATION OF DENTAL DEGREE ACQUISITION

International location of acquiring dental	Frequency	Percentage
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degree		
Arab country	25	23.81%
Europe	6	5.71%
KSA	66	62.86%
America	7	6.67%
Asia	1	0.95%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.6 Years since graduation:

Table 5 shows the distribution of participants according to the number of years passed since graduation, with most participants in the 5-10 years group (47.62%), followed by >10 years (28.57%) and <5 years (23.81%).

TABLE 5.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO YEARS SINCE GRADUATION

Years since graduation	Frequency	Percentage
<5	25	23.81%
from 5-10	50	47.62%
>10	30	28.57%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.7 Pharmacology courses taken:

Table 6 shows the distribution of participants according to pharmacology courses they had taken. During their general dental education, 62.86% of respondents took pharmacology courses, 0.95% took them after graduation, and 36.19% pursued them during both their general dental education and post-graduation.

TABLE 6.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO PHARMACOLOGY COURSES TAKEN DURING DIFFERENT EDUCATION PERIODS

Pharmacology courses taken	Frequency	Percentage
After graduation	1	0.95%
During graduation	66	62.86%
Both	38	36.19%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

### 3.8 Area of specialization:

Table 7 shows the distribution of participants according to the area of specialization. The distribution of the groups, in descending order of the number of participants, were as follows: general dentistry (55.24%), restorative dentistry (20.00%), endodontics and conservative dentistry (11.43%), pediatric dentistry (9.52%), public health dentistry (5.71%), orthodontics and dentofacial orthopedics (2.86%), periodontics (2.86%), and oral and maxillofacial surgery and prosthodontics (1.90%).

TABLE 7.

DISTRIBUTION OF PARTICIPANTS ACCORDING TO THE AREA OF SPECIALIZATION (MULTIPLE SELECTIONS PERMITTED)

Area of specialization	Frequency	Percentage
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Dental public health	6	5.71%
Endodontics and conservative dentistry	12	11.43%
Oral and maxillofacial surgery	2	1.90%
Orthodontics and dentofacial orthopedics	3	2.86%
Pediatric dentistry	10	9.52%
Periodontics	3	2.86%
Prosthodontics	2	1.90%
Restorative	21	20.00%
<b>General dentistry</b>	<b>58</b>	<b>55.24%</b>

### 3.9 Use and abuse of antibiotics in dentistry:

Table 8 shows that the majority of respondents (95.24%) prescribed antibiotics for their patients, while only 4.76% did not.

TABLE 8.

PRESCRIPTION OF ANTIBIOTICS FOR PATIENTS

Do you prescribe antibiotics for your patients?	Frequency	Percentage
Yes	100	95.24%
No	5	4.76%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 9 shows that the majority of respondents (89.52%) prescribed antibiotics for facial swelling, 1.90% prescribed antibiotics for warmth of skin, and 8.57% prescribed antibiotics when both facial swelling and warmth of skin were present.

TABLE 9.

PURPOSE OF PRESCRIBING ANTIBIOTICS

Do you prescribe antibiotics for	Frequency	Percentage
Warmness of skin	2	1.90%
Facial swelling	94	89.52%
Both	9	8.57%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 10 shows that amoxicillin was the most commonly prescribed antibiotic. It was prescribed by 69.52% of respondents, followed by 28.57% prescribing amoxicillin and clavulanic acid, and only 1.90% prescribing penicillin.

TABLE 10.

MOST COMMONLY PRESCRIBED ANTIBIOTICS

What is the most common antibiotic prescribed by you?	Frequency	Percentage
Penicillin	2	1.90%
Amoxicillin	73	69.52%
Amoxicillin and clavulanic	30	28.57%

acid		
<b>Total</b>	105	100.00%

Table 11 shows that the majority of respondents (95.24%) recorded the full medical history and allergy history before prescribing antibiotics, while 4.76% did not.

TABLE 11.

RECORDING FULL MEDICAL HISTORY AND ALLERGY HISTORY BEFORE PRESCRIBING ANTIBIOTICS

Do you obtain full medical history and allergy history before prescribing antibiotics?	Frequency	Percentage
Yes	100	95.24%
No	5	4.76%
<b>Total</b>	105	100.00%

Table 12 shows that 35.24% of respondents were abused and attacked for refusing to prescribe antibiotics to patients, while 64.76% had no such experience.

TABLE 12.

INCIDENTS OF ABUSE OR ATTACKS BECAUSE OF REFUSAL TO PRESCRIBE ANTIBIOTICS TO PATIENTS

Have you been abused and attacked because of refusal to prescribe the patient an antibiotic?	Frequency	Percentage
Yes	37	35.24%
No	68	64.76%
<b>Total</b>	105	100.00%

Table 13 shows that the majority of respondents (80.00%) permitted their patients to keep antibiotics in their homes, while 20.00% preferred that they did not.

TABLE 13.

PATIENTS KEEPING ANTIBIOTICS IN THEIR HOMES

Do patients keep antibiotics in their homes?	Frequency	Percentage
Yes	84	80.00%
No	21	20.00%
<b>Total</b>	105	100.00%

Table 14 shows that the majority of respondents (85.71%) did not prescribe antibiotics to patients intending to travel, or for any other casual request, while 14.29% did.

TABLE 14.

PRESCRIPTION OF ANTIBIOTICS FOR PATIENTS INTENDING TO TRAVEL OR FOR ANY OTHER CHANCE REQUIREMENTS

Have you prescribed an antibiotic for a patient intending to travel or for any other chance require-	Frequency	Percentage
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ment?	Frequency	Percentage
Yes	15	14.29%
No	90	85.71%
<b>Total</b>	105	100.00%

Table 15 shows that 44.76% respondents prescribed prophylactic antibiotics before surgical procedures, while 55.24% did not.

TABLE 15.

PRESCRIBING ANTIBIOTICS AS A PREVENTIVE MEASURE IN SURGICAL PROCEDURES

Do you prescribe antibiotics as a preventive measure in surgical procedure?	Frequency	Percentage
Yes	47	44.76%
No	58	55.24%
<b>Total</b>	105	100.00%

Table 16 shows that 41.90% of respondents rarely prescribed antibiotics for dental infections, while 27.62%, 21.90%, and 8.57% prescribed antibiotics on a weekly, monthly, and daily basis, respectively.

TABLE 16.

PRESCRIPTION OF ANTIBIOTICS FOR DENTAL INFECTIONS

How often do you write prescriptions for antibiotics for dental infections?	Frequency	Percentage
Daily	9	8.57%
Weekly	29	27.62%
Monthly	23	21.90%
Rarely	44	41.90%
<b>Total</b>	105	100.00%

Table 17 shows that most respondents (82.86%) did not prescribe the same antibiotics to patients with recurrent oral infections, but 17.14% did.

TABLE 17.

PRESCRIBING SAME ANTIBIOTICS TO PATIENTS SUFFERING FROM RECURRENT ORAL INFECTION

Do you prescribe the same antibiotics to the patient suffering from recurrent oral infection?	Frequency	Percentage
Yes	18	17.14%
No	87	82.86%
<b>Total</b>	105	100.00%

Table 18 shows most respondents (90.48%) did not prescribe

antibiotics for their patient over phone calls or messages, as opposed to the 9.52% who did.

TABLE 18.

PRESCRIBING ANTIBIOTICS TO THE PATIENT OVER PHONE CALLS OR MESSAGES

Do you prescribe antibiotics for your patient over phone calls or messages?	Frequency	Percentage
Yes	10	9.52%
No	95	90.48%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 19 records the opinion of dentists on how patients procured antibiotics. Of respondents, 61.90% believed that dental patients procured antibiotics using a dentists' prescription, 14.29% that they were procured after a pharmacists' advice, 13.33% attributed antibiotics purchase to the personal choice of patients, and 10.48% believed patients procured antibiotics on the advice of a non-medical person's advice.

TABLE 19.

DISTRIBUTION OF HOW DENTAL PATIENTS PROCURE ANTIBIOTICS

From your point of view, how do dental patients procure antibiotics?	Frequency	Percentage
Doctor's prescription	65	61.90%
Pharmacist's advice	15	14.29%
Non-medical person's advice	11	10.48%
Personal choice	14	13.33%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 20 shows that 80.95% respondents believed that patients stopped using antibiotics on their own when symptoms improved, while 19.05% did not agree.

TABLE 20.

DISTRIBUTION OF PATIENTS WHO STOP USING ANTIBIOTICS ON THEIR OWN AFTER SYMPTOMATIC RELIEF

In your experience, do patients stop using antibiotics on their own when they feel better?	Frequency	Percentage
Yes	85	80.95%
No	20	19.05%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 21 shows that 56.19% of respondents indicated that patients discussed the usage instructions of the antibiotics with them, while 43.81% indicated that patients did not discuss any details with them.

TABLE 21.

DISCUSSION BETWEEN THE PATIENT AND DENTIST ABOUT THE USAGE INSTRUCTIONS THAT ARE INCLUDED WITH THE ANTIBIOTICS

Does the patient discuss with you the usage instructions that are included with the antibiotics?	Frequency	Percentage
Yes	59	56.19%
No	46	43.81%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 22 shows that most respondents (92.38%) indicated that they advised the patient and provided sufficient education to complete the antibiotic dosage to ensure its effectiveness, but 7.62% did not.

TABLE 22.

ADVISING AND PROVIDING PATIENTS WITH SUFFICIENT EDUCATION TO COMPLETE THE DOSES OF ANTIBIOTICS TO ENSURE EFFECTIVENESS

Do you advise the patient and provide sufficient education to complete the doses of antibiotics to ensure its effectiveness?	Frequency	Percentage
Yes	97	92.38%
No	8	7.62%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 23 shows that 68.57% of the respondents indicated that patients frequently responded to the guidance of antibiotic use, while 18.10% always responded, and 13.33% rarely did.

TABLE 23.

RESPONSE OF PATIENTS TO THE GUIDANCE OF ANTIBIOTIC USE

Do patients respond to the guidance of antibiotic use?	Frequency	Percentage
Rarely	14	13.33%
Frequently	72	68.57%
Always	19	18.10%
<b>Total</b>	<b>105</b>	<b>100.00%</b>

Table 24 shows that 53.33% and 5.71% of the respondents thought it necessary to use antibiotics after surgical tooth extraction, and for dental pain relief and post-root canal treatment, respectively. Of the remaining, 4.76% thought it was necessary to use antibiotics for all dental treatments in diabetic patients, and only 0.95% advocated the use antibiotics after scaling; 44.76% did not agree with any of the above.

TABLE 24.

CASES REQUIRING NECESSARY USE OF ANTIBIOTICS (MULTIPLE SELECTIONS PERMITTED)

In which of the following cases is	Frequency	Percentage
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it necessary to use antibiotics?		
To relieve dental pain	6	5.71%
After scaling	1	0.95%
After root canal treatment	6	5.71%
After surgical tooth extraction	56	53.33%
For all dental treatment in diabetic patients	5	4.76%
None of above	47	44.76%

#### 4 DISCUSSION

Excessive use of antibiotics can cause health problems, leading to increased growth of antibiotic-resistant bacteria, making them less effective in reducing pain and infections. This inappropriate use is especially common in dentistry because of non-compliance with instructions regarding use, dentist's recommendations, or discontinuation of antibiotics as soon as symptoms have abated. These factors need to be studied to provide the best dental healthcare practices.

The aim of this study was to identify the use and misuse of antibiotics in dentistry in Saudi Arabia from the point of view of dentists. In this study, the majority of respondents (95.24%) prescribed antibiotics for their patients. This demonstrates a conviction of the dentists involved in this study of the importance of antibiotics in the treatment of oral infections. This is consistent with previous studies that have confirmed that antibiotics are the most common treatment interventions to treat oral and dental infections.[11],[12] However, they also warned against the inappropriate use of antibiotics, which may cause adverse side effects in patients. Notably, Maslamani and Sedeqi [13] stated that 83.7% of respondents did not prescribe antibiotics for patients who complained of severe pain.

In the current study, the majority of respondents (89.52%) prescribed antibiotics for facial swelling, which confirms the dentists' knowledge of the role and effectiveness of antibiotics in reducing facial and oral infections. Furthermore, this is consistent with the findings of Abu-Mostafa et al.[9] that dentists (68.8%) believed antibiotics relieved dental pain, especially in facial and oral infections, and 33.8% believed that there was no need for antibiotics after scaling.

There are several types of antibiotics used in oral and dental infections. According to the current study, amoxicillin was the most commonly prescribed antibiotic by dentists. Several previous studies indicate that amoxicillin is the most commonly used antibiotic, provided there is no medical sensitivity. Emeka et al.[14] reported that amoxicillin is very commonly used in Saudi Arabia, where several studies confirmed that it is the first-choice of antibiotics for dental patients with no medical allergies.[15],[16],[17] A majority of the respondents (95.24%), recorded the full medical and allergy history of patients before prescribing antibiotics. Al Khuzaei et al.[11] confirmed that the majority of respondents (92.5%) used penicillin as the first-line drug in case of local infection or medical allergies after reviewing the patients' medical history and sensitivity to antibiotics.

According to the current study, 64.76% of respond-

ents were not abused or attacked for refusal to prescribe an antibiotic to the patient. This indicated the confidence of Saudi patients in their dentists, and their recommendations to reduce pain or inflammation caused by dental infections. The majority of respondents (80.00%) permitted their patients to keep antibiotics in their homes, suggesting that the patients were convinced in the effectiveness of antibiotics in relieving pain and eliminating facial swelling and dental infections. A study by Abu-Mostafaa et al.[9] showed that 47.8% of respondents kept antibiotics at home, to consume without a prescription or even advice from a pharmacist. According to the current study, the majority of respondents (85.71%) did not prescribe antibiotics to patients intending to travel or for any other casual request. Furthermore, 44.76% prescribed antibiotics as a preventive measure before surgical procedures, but 55.24% did not. A study by Suda et al.[18] reported the use of antibiotics as prophylaxis before surgical procedures.

The current study reported that 41.90% of the respondents rarely prescribed antibiotics for dental infections, while 27.62% and 21.90% prescribed them weekly and monthly, respectively. The majority of respondents (82.86%) did not prescribe the same antibiotics to patients suffering recurrent oral infections. According to Poveda-Roda et al.,[19] antibiotics are commonly used in dental practices. It has been estimated that 10% of all antibiotic prescriptions are related to dental infections. Dentists prescribe antibiotics for treatment and prevention of odontogenic and non-odontogenic infections.[1]

In the current study, most respondents (90.48%) did not prescribe antibiotics over the phone, through messaging platforms, or e-mail. This means that dentists are aware of the importance of examining the patient and identifying each patient's complications as a unique. In the current study, 61.90% of the dentists observed that dental patients procured antibiotics with a dentist's prescription, while 14.29%, 13.33%, and 10.48% reported that patients got them on the advice of a pharmacist, by personal choice, and by a non-medical person's advice, respectively. This indicates that patients have a positive attitude towards the ability of dentists to provide advice and guidance regarding the use of antibiotics. Although some patients may resort to advice from relatives or a pharmacist, the dentist is still the first source of information for most patients. A study by Abu-Mostafaa et al.[9] reported that 77.8% of patients procured antibiotics based on a doctor's prescription, while a study by Belkina et al.[20] reported the prevalence of self-directed use of antibiotics in Saudi Arabia, which was estimated to be 48%.

In the he current study, the majority of respondents (80.95%) agreed that patients stopped using antibiotics on their own when they felt better. The study of Abu-Mostafaa et al.[9] reported 53% of respondents stopped taking antibiotics after they felt relief. There is a conviction among patients to stop antibiotics once the symptoms are relieved, and this practice is prevalent among people of the Middle East. This in turn increases the growth of bacteria resistant to antibiotics, prolongs the period of treatment, and increases the cost of health care, thereby reducing the effectiveness and efficiency of antibiotics used in the future.

In the current study, 56.19% of the respondents re-

ported that the patient discussed the antibiotic usage instructions, while 43.81% reported otherwise. Furthermore, 68.57% of the respondents said that patients frequently responded to the guidance of antibiotic use. Another study stated that 57% of the respondents read the instructions label of the medication. This means that others depended on the explanation of pharmacists or used it without reading the instructions. Furthermore, only 53% looked at the expiry date before use, which increases the risk of expiry complications and toxicity, especially for those keeping antibiotics at home.[9] The majority of respondents (92.38%) claimed that they advised the patients and provided sufficient education to complete the doses of antibiotics, to ensure its effectiveness. A study by Al Khuzaei et al.[11] reported that 65.4% believed that completion of the antibiotics course was necessary for its effectiveness in some cases only.

In the current study, 53.33% of the respondents indicated that it was necessary to use antibiotics after surgical tooth extraction. However, this topic has had many conflicting reports and studies, with some reports stating that antibiotic use after extraction reduces the occurrence of infection.[21],[22] However, studies by MacGregor,[23] Sands et al.,[24] Rodrigues et al.,[25] and Calvo et al.[26] did not recommend antibiotics for routine third molar surgeries. Additionally, studies by Prajapati et al.,[27] Xue et al.,[28] Poeschl et al.,[29] and Sidana et al.[30] demonstrated that routine administration of antibiotics is not required post-extraction.

## 5 Conclusion

Antibiotics are commonly used in dental care in Saudi Arabia. Prescription of antibiotics for facial swelling is considered essential by dentists. Amoxicillin was the most common antibiotic prescribed by dentists. The majority of dentists recorded full medical and allergy history before prescribing antibiotics. Several patients kept antibiotics in their homes. Most dentists avoided prescribing antibiotics for patients intending to travel or for any other casual purposes. The majority of dentists refrained from prescribing the same antibiotics to patients suffering from recurrent oral infections and did not prescribe antibiotics for patients over the phone or through messaging platforms. Dentists are the first choice for dental patients to get antibiotics via prescription. The majority of patients discontinued the use of antibiotics on their own after symptomatic relief. Generally, dentists advised their patients and provided sufficient education on the importance of completing the antibiotic course to ensure its effectiveness. More than half the dentists advocated using antibiotics after surgical tooth extraction.

## REFERENCES

[1] N.S. Dar-Odeh, O.A. Abu-Hammad, M.K. Al-Omiri, A.S. Khraisat and A.A. Shehabi, "Antibiotic Prescribing Practices by Dentists: A Review," *Ther Clin Risk Manag*, vol. 6, pp. 301-306, 2010.  
[2] J.B. Epstein, S. Chong and N.D. Le, "A Survey of Antibiotic Use in Dentistry," *J Am Dent Assoc*, vol. 131, no. 11, pp. 1600-1609, 2000.  
[3] M.A. Lewis, "Why We Must Reduce Dental Prescription of Antibiotics: European Union Antibiotic Awareness Day," *Br Dent J*, vol. 205, no. 10, pp. 537-538, 2008.

[4] K.M. Roy and J. Bagg, "Antibiotic Prescribing by General Dental Practitioners in the Greater Glasgow Health Board, Scotland," *Br Dent J*, vol. 188, no. 12, pp. 674-676, 2000.  
[5] K. Al-Johani, S.G. Reddy, A.S. Al Mushayt and A. El-Housseiny, "Pattern of Prescription of Antibiotics among Dental Practitioners in Jeddah, KSA: A Cross-Sectional Survey," *Niger J Clin Pract*, vol. 20, no. 7, pp. 804-810, 2017.  
[6] R.M. Roberts, M. Bartoces, S.E. Thompson and L.A. Hicks, "Antibiotic Prescribing by General Dentists in the United States," *J Am Dent Assoc*, vol. 148, no. 3, pp. 172-178, 2017.  
[7] L.S. Spittle, K.B. Muzzin, P.R. Campbell, J.P. DeWald and F. Rivera-Hidalgo, "Current Prescribing Practices for Antibiotic Prophylaxis: A Survey of Dental Practitioners," *J Contemp Dent Pract*, vol. 18, no. 7, pp. 559-566, 2017.  
[8] S. Vanka, O. Wali and A. Vanka, "Antibiotic Abuse: A Public Health Nightmare," *J Dent Oral Biol*, vol. 2, no. 17, pp. 1101, 2017.  
[9] A. Al Rasheed, U. Yagoub, H. Alkhashan, O. Abdelhay, A. Alawwad, A. Al Aboud and S. Al Battal, "Prevalence and Predictors of Self-Medication with Antibiotics in Al Wazarat Health Center, Riyadh City, KSA," *Biomed Res Int*, 3916874, 2016.  
[10] N. Abu-Mostafa, N. Al-Mejlad, A. Al-Yami, F. Al-Sakhin and S. Al-Mudhi, "A Survey of Awareness Related to the Use of Antibiotics for Dental Issues Among Non-Medical Female University Students in Riyadh, Saudi Arabia," *J Infect Public Health*, vol. 10, no. 6, pp. 842-848, 2017.  
[11] N.M. Al Khuzaei, M.K. Assery, T. Al Rahbeni and M. Al Mansoori, "Knowledge of Antibiotics Among Dentists in Saudi Arabia," *J Int Oral Health*, vol. 9, pp. 71-80, 2017.  
[12] A. Ramasamy, "A Review of Use of Antibiotics in Dentistry and Recommendations for Rational Antibiotic Usage by Dentists," *Int Arabic J Antimicrob Agents* vol. 2, pp. 1-15, 2014.  
[13] M. Maslamani and F. Sedeqi, "Antibiotic and Analgesic Prescription Patterns Among Dentists or Management of Dental Pain and Infection During Endodontic Treatment," *Med Princ Pract*, vol. 27, pp. 66-72, 2018.  
[14] P.M. Emeka, M. Al-Omar and T.M. Khan, "Public Attitude and Justification to Purchase Antibiotics in the Eastern Region Al Ahsa of Saudi Arabia," *Saudi Pharm J*, vol. 22, pp. 550-554, 2014.  
[15] A. Rodriguez-Nunez, R. Cisneros-Cabello, E. Velasco-Ortega, J.M. Llamas-Carreras, D. Torres-Lagares and J.J. Segura-Egea, "Antibiotic Use by Members of the Spanish Endodontic Society," *J Endod*, vol. 35, pp. 1198-1203, 2009.  
[16] N. Sku č ait è, V. Pe č iulien è, R. Manelien è and V. Ma č iulskien è, "Antibiotic Prescription for the Treatment of Endodontic Pathology: A Survey Among Lithuanian Dentists," *Medicina (Kaunas)*, vol. 46, pp. 806-813, 2010.  
[17] J.J. Segura-Egea, J. Martin-Gonzalez, MdC. Jimenez-Sanchez, I. Crespo-Gallardo, J.J. Saucó-Marquez and E. Velasco-Ortega, "Worldwide Pattern of Antibiotic Prescription in Endodontic Infections," *Int Dent J*, vol. 17, 2017, doi:10.1111/idj.12287.  
[18] K.J. Suda, G.S. Calip, J. Zhou, S. Rowan, A.E. Gross, R.C. Hershov, R.I. Perez, J.C. McGregor and C.T. Evans, "Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures 2011 to 2015," *JAMA Netw Open*, vol. 2, no. 5, 193909, 2019.  
[19] R. Poveda-Roda, J.V. Bagán, J.M. Sanchis-Bielsa and E. Carbonell-Pastor, "Antibiotic Use in Dental Practice: A Review," *Med Oral Patol Oral Cir Bucal*, vol. 12, no. 186-192, 2007.  
[20] T. Belkina, A. Al Warafi, E. Hussein Eltom, N. Tadjieva, A. Kubena and J. Vlcek, "Antibiotic Use and Knowledge in the Community of Yemen, Saudi Arabia, and Uzbekistan," *J Infect Dev Ctries*, vol. 8, pp. 424-429, 2014.  
[21] J.A. Moreno-Drada and H.A. García-Perdomo, "Effectiveness of Antimicrobial Prophylaxis in Preventing the Spread of Infection as a Result of Oral Procedures: A Systematic Review and Meta-analysis," *J Oral Maxillofac Surg*, vol. 74, pp. 1313-1321, 2016.

- [22] K.B. Marcussen, A.S. Laulund, H.L. Jørgensen and E.M. Pinholt, "A Systematic Review on Effect of Single-Dose Preoperative Antibiotics at Surgical Osteotomy Extraction of Lower Third Molars," *J Oral Maxillofac Surg*, vol. 74, pp. 693-703, 2016.
- [23] A.J. MacGregor, "Reduction in Morbidity in the Surgery of the Third Molar Removal," *Dent Update*, vol. 17, pp. 411-414, 1990.
- [24] T. Sands, B.R. Pynn and S. Nenniger, "Third Molar Surgery: Current Concepts and Controversies Part 1," *Oral Health*, vol. 83, pp. 11-14, 1993.
- [25] W.C. Rodrigues, R. Okamoto, E.P. Pellizzer, A.C. dos Carrijo, R.S. de Almeida, W.M. de Melo, "Antibiotic Prophylaxis for Third Molar Extraction in Healthy Patients: Current Scientific Evidence," *Quintessence Int*, vol. 46 pp. 149-161, 2015.
- [26] A.M. Calvo, D.T. Brozoski, F.P. Giglio, P.Z. Gonçalves, E. Santana, T.J. Dionísio, J.R. Lauris and C.F. Santos, "Are Antibiotics Necessary after Lower Third Molar Removal," *Oral Surg Oral Med Oral Pathol Oral Radiol*, vol. 114, pp. 199-208, 2012.
- [27] A. Prajapati, A. Prajapati and S. Sathaye, "Benefits of Not Prescribing Prophylactic Antibiotics after Third Molar Surgery," *J Maxillofac Oral Surg*, vol. 15, pp. 217-220, 2016.
- [28] P. Xue, J. Wang, B. Wu, Y. Ma, F. Wu, R. Hou, "Efficacy of Antibiotic Prophylaxis on Postoperative Inflammatory Complications in Chinese Patients having Impacted Mandibular Third Molars Removed: A Split-Mouth, Double-Blind, Self-Controlled, Clinical Trial," *Br J Oral Maxillofac Surg*, vol. 53, pp. 416-420, 2015.
- [29] P.W. Poeschl, D. Eckel and E. Poeschl, "Postoperative Prophylactic Antibiotic Treatment in Third Molar Surgery – A Necessity," *J Oral Maxillofac Surg*, vol. 62, pp. 3-8, 2004.
- [30] S. Sidana, Y. Mistry, A. Gandevala and N. Motwani, "Evaluation of the Need for Antibiotic Prophylaxis during Routine Intra-Alveolar Dental Extractions in Healthy Patients: A Randomized Double-Blind Controlled Trial," *J Evid Based Dent Pract*, vol. 17, pp. 184-189, 2017.

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