



Original Research Article

Antibiotics prescription patterns among dentists in Amman city, Hashemite Kingdom of Jordan: A cross-sectional survey

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ABSTRACT

Background: The purpose of this study was to evaluate dental practitioners' knowledge and attitudes regarding therapeutics and prophylactic antibiotics prescription in Amman city, Jordan.

Materials and Methods : It was a descriptive cross-sectional survey based on the questionnaire. The questionnaire was converted to an electronic form using Google forms [Google Forms, a free web-based survey generator]. The questionnaire consists of two parts of a total of 20 questions of both multiple-choice and closed questions. The first part of the questionnaire included questions regarding demographic data, specialty, education level, years of experience, place of work, and average activity per week. The second part of the questionnaire investigated the dentist's usual prescription pattern of antibiotics and factors that influence their behavior, knowledge about antibiotic prophylaxis, pulpal and periradicular condition in which antibiotics are indicated, most commonly prescribed antibiotics and antibiotics therapy duration.

Results: A total of 253 dental practitioners participate in this study, dentists from the private sectors represented the largest number of participants about 73.5% followed by dentists from the ministry of health accounts for about 17%. Female respondents were [168] accounts for 66.14% and male [86] accounts for 33.86%. The majority of the participants were general dentists 68.9% while the remaining consists of participants from the different specialties. Most of the respondents 77.13% [195] choose amoxicillin as the first line to treat dental infections in patients not allergic to penicillin [alone 19, 76%, or associated with clavulanic acid 47.43%. If a patient was found to be allergic to penicillin, more than half the participants 66.4% choose clindamycin 300mg as the first choice of antibiotics to treat the dental infection. 83.4 % of the respondents answer correctly the need for antibiotics prophylaxis in the case of a prosthetic heart valve and 78.3% for previous infective endocarditis illness.

Conclusion: The results of this study suggest that dental practitioners in Amman city have prescribed antibiotics without a rational scientific clinical basis in endodontic cases not indicated for antibiotics therapy. This study highlighted the importance of continuous dental educations and the developments of national and local antibiotics guidelines to rationalize the use of antibiotics in Dental Practices.

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1. Introduction

Antibiotics and analgesics are the most commonly prescribed medicines by dental practitioners. Antibiotics are prescribed in dental practice for the treatment of acute and chronic infections of odontogenic and non-odontogenic origins, as a prophylactic treatment to prevent focal infection in patients at high risks such as infective

endocarditis, artificial prosthetics joint, and immune-compromised patients, besides, to prevent local infection and systemic spread among patients undergoing oral surgical or dental treatment.¹ Patients seeking dentists for treatment of endodontic infections often expect an antibiotics prescription and there is an increasing habit of antibiotics prescription which is inappropriate.² Antibiotics prescription may be associated with unfavorable adverse effects which include gastrointestinal disturbance, clostridium difficile infection, and overgrowth of resistant

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microorganisms, drug interaction, nausea, and fatal anaphylactic shock.^{3–5} Antibiotics resistance of bacteria nowadays has been a challenging issue for dentists because these bacteria are resistant to all types of antimicrobial agents since these introduced in the market.^{6,7} The increasing resistance problem developed is related to over or misuse of broad-spectrum antibiotics. Resistance is often developed when the dentist prescribes antibiotics inappropriately by wrong administration route, dosage, and time duration.^{8,9} For this reason, it is an urgent necessity for countries in the world especially in our countries in the Middle East to develop a national and local antibiotics stewardship that will provide regular updates on antibiotics prescription, bacterial resistance to antibiotics, and the most common pathogens in the facility.

Endodontic treatment aims to remove the infection and to prevent the bacteria from infection or reinfection of the root canal space and periradicular area. Despite the effectiveness of antibiotics, treatment of endodontic infections can be achieved by mechanical instrumentation and chemical cleaning of the root canal, so understanding the microbiology of the root canal infection is the basis for the success of the root canal treatments and retreatment. Odontogenic infections, including endodontic infections have a polymicrobial nature, with obligate anaerobic dominating the microbial agents in primary infection.¹⁰ The endodontic microorganisms that caused the primary intra-radicular infection are black pigmented gram-negative anaerobic rods, obligate anaerobic gram-negative coccobacillus, gram-positive anaerobic rods, and gram-positive cocci.¹⁰ Therefore, antibiotics are indicated in restricted cases where there is a rapidly spreading infection with signs and symptoms of systemic involvement.

Antibiotics selection for treatment of endodontic infection is empirical without sensitivity tests is based on knowledge of the microorganisms usually involved in the infections.¹¹ Therefore they can be used as an adjuvant in the treatment of apical periodontitis to prevent the spread of the infection only in acute apical abscesses with severe signs and symptoms which include fever >38, malaise, cellulitis, unexplained trismus, lymphadenopathy and swelling beyond a simple localized mucosal enlargement,¹¹ and in the progressive and persistent infection.¹² Other pulpal and periodontal diagnostic cases like symptomatic irreversible pulpitis with symptomatic apical periodontics, necrotic pulp with asymptomatic apical periodontics, necrotic pulp with chronic apical abscess and a localized fluctuant swelling do not require adjuvant antibiotics therapy. Segura-Egea et al¹³ in their study worldwide pattern of antibiotic prescription in endodontic infections founded that Amoxicillin was the drug of choice for the treatment of endodontic infections in most countries, and clindamycin and erythromycin were the drug of choice in patients allergic to penicillin. They also concluded

that dentists' worldwide prescribed antibiotics for non-indicated conditions, such as pulpitis and antibiotics were overprescribed for the management of endodontic infections.

Infective endocarditis (IE) is a serious medical condition that can be fatal which results from stormy blood flow created by definite types of congenital or acquired cardiac diseases, such as flow from a high to a low-pressure chamber or across a narrowed orifice, injuring the endothelium.¹⁴ This produces a tendency towards the deposition of platelets and fibrin on the surface of the endothelium, leading to the nonbacterial thrombotic endocarditis (NBTE).¹⁴ Invasion of the bloodstream with a microbial species that has the pathogenic potential to colonize this site, then adherence of the bacteria in the bloodstream to NBTE, and proliferation of bacteria within a vegetation can then result in IE.¹⁴ Several international guidelines regarding prophylaxis of infective endocarditis are available many years ago. The American heart association guidelines 2007¹⁴ has revised the guidelines for the cardiac conditions that needed antibiotic prophylaxis to prevent Infective endocarditis (IE) and recommended that infective endocarditis prophylaxis for dental procedures is reasonable only for patients with underlying cardiac conditions associated with the highest risk of adverse outcome from infective endocarditis. Patients with these underlying cardiac conditions, prophylaxis is reasonable for all dental procedures that involve manipulation of gingival tissue or the periapical region of teeth or perforation of the oral mucosa.¹⁴ The British Society for antimicrobial chemotherapy guideline 2006,¹⁵ and the national institute for health and clinical excellence guidelines [NICE] 2008,¹⁶ also recommended a restrictive use of antibiotics prophylaxis to prevent infective endocarditis illness either by reducing the number of a cardiac conditions or by reducing the dose and frequency of antibiotics.

Several studies worldwide have been evaluated antibiotic knowledge and dental practitioner's attitudes towards antibiotics prescription to treat pulpal and periradicular infection. In Jordan, three studies were conducted before this study, one conducted by Abu Karaky et al¹⁷ that investigated antibiotics prescription in oral implantology and the others done by Dar-Odeh et al^{18,19} which evaluated antibiotics prescription by dental practitioners at Jordan university. This study aimed to assess dental practitioners' knowledge and attitudes regarding therapeutics and prophylactic antibiotics prescription in Amman city, Jordan.

2. Materials and Methods

It is a cross-sectional survey which received ethical approval from the institutional review board (IRB) at Prince Hamzeh hospital. The questionnaire was anonymous so the privacy of the participant is maintained. A web form of the questionnaire was sent to the dentists in Amman city

and who agree to participate in the study answered the questionnaire and resent it again so no written consent form is needed. The purpose of the study was explained to the participants at the beginning of the questionnaire which was to evaluate dental practitioner's knowledge and attitudes regarding antibiotics prescription in Amman city during January, 2020.

A standard form of the questioners was designed in English then it was piloted by 10 dentists to assess its clarity, consistency, validity, and correlation of the questions by asking the dentists if they found any difficulty in answering the questions and if they wanted to omit or add any question. The questionnaire consists of two parts of a total of 20 questions of both multiple-choice and closed-ended questions. The first part of the questionnaire contained 8 questions regarding demographic data, specialty, level of education, graduation place, years of experience, place of work, and the number of patients they treated per week. The second part contained 12 questions that evaluated the dentist's attitudes and knowledge about antibiotics prescription patterns. Dentists were asked detailed questions about (1) source of information regarding antibiotics prescription, (2) first choice antibiotics to treat dental infections in patients not allergic to penicillin, (3) first choice antibiotics in patients allergic to penicillin, (4) duration of the antibiotic regimen, (5) how often they write antibiotics, (6) influencing factors that affect antibiotics prescription, (7) attitudes towards patients who already on antibiotics' regimen,⁸ pulpal and periodontal diagnosis in which antibiotics are indicated which was adopted from previous studies done by Yingling et al,²⁰ Rodriguez -Nunez et al²¹ and segura-egesa et al²² in USA and Spain,⁹ cardiac condition in which antibiotic prophylaxis are indicated and the last three questions were about awareness of antibiotics resistance.

An electronic version of the questionnaire by using Google forms (a free web-based survey generator) was prepared and adopted in this study. The same questions and answering options on the paper format were converted to the electronic form. An electronic link of the questionnaire was generated and distributed through social media platforms (WhatsApp, messengers, and Facebook) to dentists groups in Amman city. One month's periods were given to the dentist to retain the answered questioners. The study questionnaire detailed the purpose of the study so written informed signed consent was not required and participation was voluntary. All data were entered in an excell sheet and then descriptive statistics using frequencies and percentages were used to describe the results. Tables and figures were used to display the results.

3. Results

A total number of 253 dental practitioners participated in this study; all demographic data and practice information

are displayed in Table 1. Dentists from the private sectors represented the largest number of participants about 73.5% followed by dentists from the ministry of health accounts for about 17%. Female respondents were (168) accounts for 66.14% and male (86) accounts for 33.86%. Regarding the age of the respondents, 62.5% (158) were younger (less than 40 years). The majority of the participants were general dentists (68.9%) while the remaining consists of participants from a different specialty. Most of the respondents graduated from Jordan universities (73.1%), (12.3%) graduated from Arab countries and the remaining graduated from other places in the world. The main source of updated information regarding the use of antibiotics was found to be textbooks (62.8%) (Figure 1). Most of the respondents 77.13% (195) choose amoxicillin as the first line of antibiotics in patients not allergic to penicillin (alone (19, 76%) or associated with clavulanic acid (47.43%), and with metronidazole (9.9%). A small number of the participants choose clindamycin 12% and 4% for metronidazole with spiramycin, Table 2 .

If the patient was found to be allergic to penicillin, more than half of the participants (66.4%) choose clindamycin 300mg as the first choice of antibiotics to treat dental infection followed by erythromycin (17.8%) (Table 3). The maximum duration of antibiotics therapy was 5 days for the majority of the participants (64%), while a considerable number of the participants prescribed antibiotics for a maximum of 7 days (23%) (Figure 2). Regarding the attitude of the dentists in writing antibiotics, (43.9%) get used to write antibiotics every week, while a considerable number (30%) prescribed antibiotics to treat dental infection in a daily basis (Figure 3). Evidence-based effectiveness of the brand was primarily considered when prescribing antibiotics which accounts for (74%), followed by the cost of the brand (38.7%), availability of the brand (36.4), and previous experience of the patients account for (27.3%) (Figure 4). Regarding the attitudes of the dentists towards patients whom already on antibiotics before the dental clinic visit, action depend on the antibiotics was chosen by (48.6% (123) of the respondents, 41.9 % (106) answered that action depend on the time antibiotics is taken, followed by continuing the antibiotics course (39.9% (99) while only 7.5% (19) of the dentists reported changing the antibiotic.

Regarding antibiotics prescription in the 7 pulpal and periradicular diagnostic conditions, the percentage of dentists who prescribe antibiotics for each condition are listed in (Figure 5). Four percent (10) of the participants would prescribe antibiotics in patients diagnosed with reversible pulpitis with moderate pain on cold. In the second clinical condition (irreversible pulpitis), 9.1% (23) of the participants would prescribe antibiotics in patients having moderate or severe symptoms preoperatively and 21.7% (55) would prescribe antibiotics if the patients having symptomatic apical periodontitis in addition to moderate

or severe pain preoperatively. In the third clinical situation (necrotic pulp), the attitudes of the respondents were as follow: only 10.7% (27) of the respondents would have prescribed antibiotics in case of asymptomatic apical periodontitis, no swelling and no or mild symptoms; 32% (83) if it is associated with symptomatic apical periodontitis, moderate or severe symptoms but with no swelling; 28% (72) in case of asymptomatic apical periodontitis associated with sinus tract (chronic abscess) and 93% (236) of the respondents would prescribe appropriate antibiotics in case of symptomatic apical periodontitis, diffused facial swelling with severe systemic manifestation.

In case of antibiotics prophylaxis for a common cardiac condition that may face the dental practitioners in their clinic, 83.4% answered correctly the need for antibiotics prophylaxis in case of a prosthetic heart valve, only 37.2% answered correctly the need for antibiotics prophylaxis in case of unrepaired cyanotic congenital heart disease and 78.3% for previous infective endocarditis illness as illustrated in Table 4. Very sadly, 36% of the participants would prescribe inappropriate in the case of a previous coronary bypass graft, 49% in case of myocardial infarction in the past 6 months, and 32% in the case of an intravascular pacemaker. Nearly all the study samples were aware of the term antibiotics resistance (98%) and (94.5) were agreed that self-medication by antibiotics to treat dental pain responsible for antibiotics resistance and (97.6%) believed that antibiotics resistance is of growing concern.

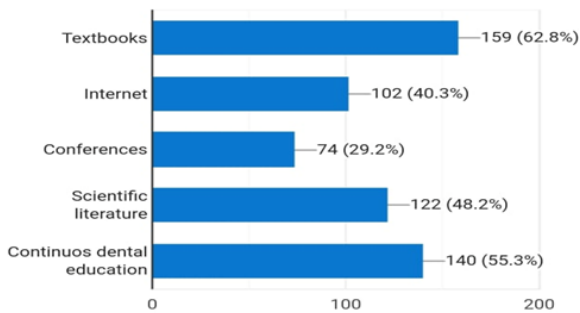


Fig. 1: Number of dentists regarding source of information of antibiotic prescription

4. Discussion

Most of the dental infection presented in the form of pulpitis and apical periodontitis and antibiotics therapy is indicated only in those situations where pulpal infection is persistent or having systemic manifestations like fever, swelling lymphadenopathy in healthy patients.²⁰ Therefore, antibiotics must be used as adjuvants treatment only in those cases where indicated and not a substitute for procedures

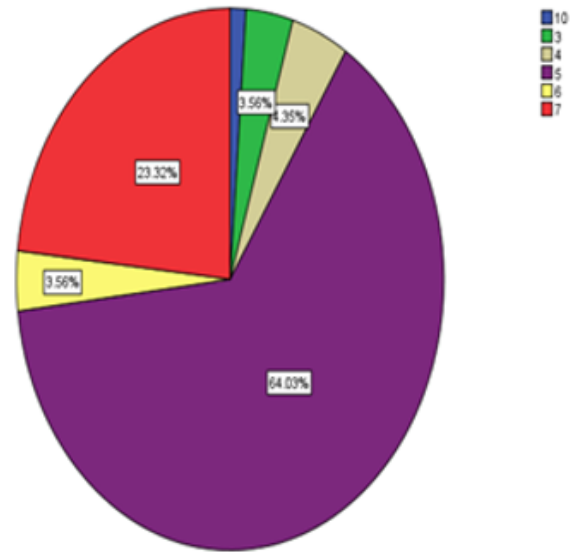


Fig. 2: For how long would you prescribe antibiotics: (Days)

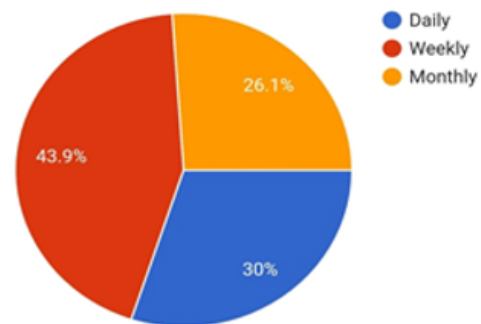


Fig. 3: How often you write antibiotic prescriptions for treatment of dental infections?

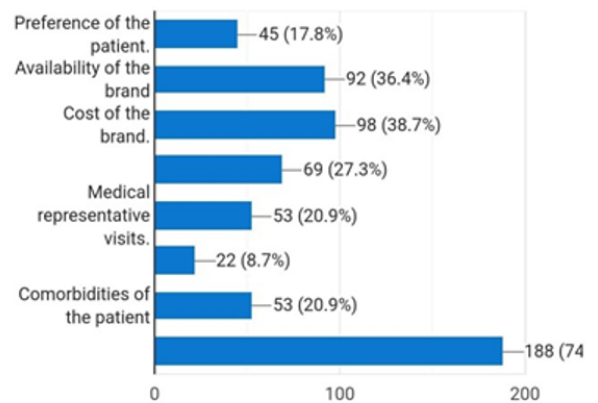


Fig. 4: Factors the dentists consider primarily when they prescribe antibiotics.

Table 1: Demographics and practice Information

Variable	Number of Dentists	Percentage (%)
Gender		
Men	86	(33.86)
Women	168	(66.14)
Age		
<30	72	(28.5)
31-40	86	(34)
41-50	75	(29.6)
>50	20	(7.9)
Experience after graduation		
>5 years	66	(26.1)
5-10 years	90	(35.6)
20-25 years	66	(26.1)
25	31	(12.3)
Specialty		
General Dentist	173	(68.4)
Paedodontist	10	(4.0)
Periodontist	6	(2.4)
Endodontist	30	(11.9)
Prosthodontist	9	(3.6)
Oral Surgeon	6	(2.4)
Orthodontist	12	(4.7)
Others	7	(2.8)
Level of education		
Bachelor	171	(67.6)
Masters	37	(14.6)
PHD	8	(3.2)
Jordanian board	37	(14.6)
Graduation place		
Jordan	185	(73.1)
Arab countries	31	(12.3)
WestemEurope	10	(4)
Asia	7	(2.8)
EastemEurope	4	(1.6)
USA	1	(0.4)
Africa	3	(12)
Ausiralia	1	(0.4)
Russia	11	(43)
Place of work		
Private sector	186	(73.5)
Academic institution	15	(5.9)
Ministry of health	43	(17.0)
Royal medical service	9	(3.6)
Number of patients you treat per week		
0-50	189	(74.7)
51-100	48	(19.0)
>100	16	(6.3)

Table 2: Antibiotics prescription to treat dental infection in patients not allergic to penicillin.

Ripe of antibiotics	Dose	Number of dentist	Percentage of dentist
Amoxicillin	500 mg	50	19S
Amoxicillin	750 mg	2	OS
Amoxicillin	1 g	9	3.6
Amoxicillin with clavulanic acid	375 mg	10	3.9
Amoxicillin with clavulanic acid	625 mg	SO	31.6
Amoxicillin with clavulanic acid	1 g	30	11.9
Clindamyc in	150 mg	10	4.0
clindamyc in	300 mg	20	7.9
XI etronidazole with spiramycin		10	4.0
Amoxicillin and metronidazole		25	9.9
Azidwomycin	250 mg	1	0.4
Azidwomycin	500 mg	1	0.4
Lineomycin	500 mg	5	2.0
Average		253	100

Table 3: Antibiotics prescription patterns to treat dental infection in patients allergic to penicillin.

Type of antibiotics	Dose	Number of dentist	Percentage of dentist
Azithromycin	250mg	14	5.5
Clindamycin:	300	168	66.4
Erythromycin	400	45	17.8
Line omycin:	500	11	43
Nletronidazole +spiramycin:		15	5.9
Total		353	100

Table 4: Attitudes of dentist towards prophylactic antibiotics

prescription in different Cardiac conditions	Frequency	Percentages %
Cardiac conditions		
Intra vascula r cardiac pacemaker	31	32
Mitral valve prolapses iv ith valvular regurtations.	92	36.4
Myocardial infarction in the past 6 months	124	49
Physiological heart murmurs	19	73
Previous coronary bypass graft	91	36
Previous infective endocarditis illness	193	73.3
Prosthetic cardiac valves.	211	33.4
Unrepaired cyanotic congenital heart disease	94	37.2
Hype● trophic cardiomyopathy	22	3.7
Patent ductus arte● iosus.	41	16.2
Mitral valves prolapse without valvular regurtations.	92	37.2

or interventions to remove the source of the infections. In special cases when the infection is too diffuse or disseminated to identify a nidus for incision, or the clinical situation does not allow for immediate curative treatment, the dentist can choose to place the patient on appropriate antibiotics until the time the curative treatment can be implemented.²³ So patients on antibiotics therapy must be evaluated daily and when the clinical situation revealed that the patient's host has regained control of the infection and the infection is resolving, the antibiotics should be terminated.²³

Most of the Endodontic infections typically have a rapid onset and resolved in a short period of 2 to 7 days,

particularly if they are treated properly and the causative factors are eliminated.²⁴ In this survey, the maximum duration of antibiotics prescription was 5 days for the majority of the respondents which was in line of other studies.^{25–27} On the contrary, other similar studies,^{21,22,28,29} the participants in these studies prescribed for a longer period, more than 5 days duration. A prolonged antibiotics therapy destroy the normal flora in the oral cavity and other parts of the body like the gut, so terminate colonization resistance and give a chance for the opportunistic infectious agents to colonized and cause serious infection.

Penicillin as antibiotics agent have been utilized as the first-line treatment for the numerous of odontogenic

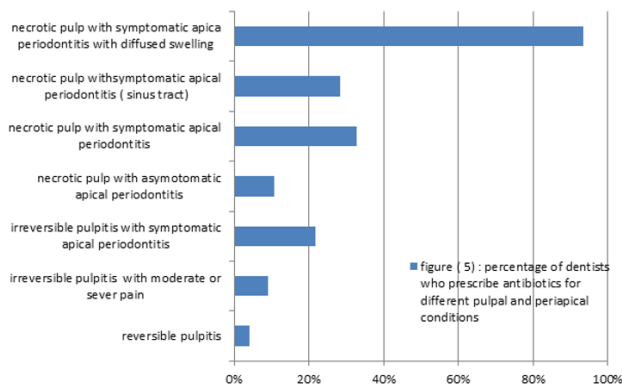


Fig. 5: Percentage of dentist who prescribe antibiotics for different pulpal and periapical conditions

infections.²² In this survey, amoxicillin alone or in combination with clavulanic acid was the commonly prescribed antibiotic for the patients not allergic to penicillin. The same result has been encountered from the previous study in Jordan where Amoxicillin and metronidazole were the most commonly prescribed antibiotics with 60% of the prescriptions containing amoxicillin and 39.4% containing metronidazole.¹⁹ It has been concluded from all the surveys done in Europe that amoxicillin, individually or combined with clavulanic acid the most preferable antibiotics for dental practitioners to treat an endodontic infection.^{21,22,28,29} The combination of penicillin's antibiotic such as amoxicillin with clavulanic acid has been deliberated by many authors to treat unresolved infection and in immune-compromised patients. In this study, amoxicillin in combination with clavulanic acid was prescribed by 47.4% of participants which was in the line of many studies^{22,30,31} yet different from other studies done in Europe^{21,29,32} where amoxicillin was considered as the preferred antibiotic in patients free from an allergy to penicillin, followed by amoxicillin combined with clavulanic acid. The same result has been found in other countries in the world^{25,27,33–35} where amoxicillin is the preferred antibiotics by the dentist followed by amoxicillin with clavulanic acid.

If the patients were allergic to penicillin, the first-line antibiotics of choice were clindamycin which was in line with data from other countries in the world like that in Europe, United Arab Emirates, England and Iran respectively^{21,22,36–38} but different from data reported from Lebanon and Belgium where macrolides were used as the first line.^{29,39} Clindamycin antibiotics is effective against most gram-positive aerobes and both gram-positive and gram-negative facultative bacteria and anaerobes¹² and it is well distributed throughout most body tissues and reached a concentration in the bone similar to that in serum.

The first pulpal condition investigated in this study was reversible pulpitis, in this case, the pain encountered is caused by faulty or broken restoration, caries, and exposed dentin so antibiotics are not indicated for the treatment of reversible pulpitis and the pulp return to normal following appropriate management of the causative factors. However, in this study, 4% of the respondents prescribed inappropriate antibiotics in such conditions. Unfortunately, the result founded in a study done by Mohan et al²⁶ in India that revealed 77.92% of undergraduate participants and 64.81% of post-graduated participants prescribed antibiotics for cases of reversible pulpitis. The second and third pulpal and periodontal diagnoses were symptomatic irreversible pulpitis with and without symptomatic apical periodontitis. In these situation, 9.1% and 21.7% of the participants prescribed inappropriately antibiotics, respectively. In such cases, the pulp is still vital but become inflamed and unable to heal. For this reason, antibiotics are not indicated in both cases and treatment can range from vital pulp therapy to nonsurgical root canal treatment with analgesic prescription. A Study done by palmar et al⁴⁰ showed that 12.5% of the respondents prescribed antibiotics for the same clinical conditions. Another study done by Miguel Silva et al⁴¹ reported 16% and 44% of the participants prescribed antibiotics. Similarly, Segura Egea et al²² reported that 86% of respondents Spanish dentists prescribed antibiotics for these two cases.

In the fourth case scenario, the pulp is necrotic with chronic apical periodontitis in a healthy patient, antibiotics therapy are not indicated. In this case debridement of the root canal is enough with adequate root canal treatment. However, in this study, 10.7% of the participants prescribed antibiotics without any indication. Other studies,^{42,43} had founded prescription percentages lower than 5% in such conditions; on the contrary higher than 10% have been reported in similar studies.^{20–22,27,44} The fifth endodontic condition is necrotic pulp, acute apical periodontitis with no swelling; our sample revealed a higher prescription rate whereas the proper treatment is cleaning and shaping of the root canal, intra-canal medicaments, and analgesics. Interestingly, several other studies worldwide,^{20–22,27,30,44} also reported higher percentages of antibiotic overuse in this situation. In cases of necrotic pulp with chronic apical periodontitis and sinus tracts present, the proper treatment is complete debridement of the root canal space and drainage of the abscess with no antibiotics prescription unless the patient is medically compromised and the sinus tract does not resolve within a few weeks, or the patient experiences acute exacerbation with systemic involvement, then antibiotics would be indicated.^{20,21} several studies^{27,30} revealed higher prescription percentages more than our study. More inspiring results were obtained by other studies,^{20,21,40,43} with percentages below 28%. In the seventh pulpal diagnosis of necrotic pulp, acute

apical periodontitis [abscess], diffused facial swelling, and moderate to severe symptoms of an infection, it is a true case where antibiotics therapy is indicated as adjuvants treatment to help the body to control the infection. In addition to an appropriate treatment plan which includes: incision and drainage of the facial swelling when it is possible and debridement of the root canal space. Most of the studies described an appropriate antibiotic at a higher rate more than 90%.^{20,21,27,35,43} The results of our study were comparable to the previous studies at 93.3%.

Regarding the attitudes of dental practitioners towards prescribing antibiotics prophylaxis to prevent infective endocarditis, the cardiac conditions which are at high risk of developing adverse events were associated with the highest percentage of correct responses. The highest percentage of correct responses were founded for patients with prosthetic heart valves and for previous infective endocarditis illness which were in agreement with other studies in the world^{45,46} and in the Arab countries (Lebanon and Saudi Arabia).^{39,47} Al Fouzan et al⁴⁷ in their study reported that 92.6% % of dentists would prescribe antibiotics for patients with a prosthetic heart valve and 87.5% for patients with previous infective endocarditis illness. Mansour et al³⁹ found that the highest knowledge was for prosthetic cardiac valves [96.4%], followed by previous infective endocarditis [80.3%]. According to the above-mentioned guidelines, only patients at high risk for developing IE should receive short term prophylaxis antibiotics before dental procedures.

5. Conclusions

The results of this study suggest that dental practitioners in Amman city have prescribed antibiotics without a rational scientific clinical basis in endodontic cases not indicated for antibiotics therapy. This study highlighted the importance of continuous dental educations and the developments of national and local antibiotics guidelines to rationalize the use of antibiotics in Dental Practices. Appropriate and correct use of antibiotics is essential to ensure safe and effective treatment. To improve standards of care and prevention of microbial resistance dentists should have a greater understanding of the disease process, an enhanced awareness of antibiotics in clinical situations. Finally, dental antibiotic stewardships becoming a critical need to audit the trend of antibiotics consumption and the antimicrobial susceptibility of endodontic pathogens that should be monitored periodically.

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