DEPARTMENT OF DENTISTRY
NAPATA COLLEGE

كلية نبتة
NAPATA COLLEGE

KNOWLEDGE AND ATTITUDE ABOUT ANTIBIOTIC USES AND SIDE EFFECTS AMONG FINAL YEAR DENTAL STUDENTS AT NAPATA COLLEGE IN 2024

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بسم الله الرحمن الرحيم

قال تعالى في محكم تنزيله:

و قل رب زدني " علما "

سورة طه ، الآية 114

DEDICATION

We dedicate this research to our parents, whose unwavering love, encouragement, and support throughout our lives have made this achievement possible.

ACKNOWLEDGEMENT

We are grateful to God for providing us with the guidance, strength, and perseverance to complete this research. We also extend our sincere appreciation to our colleagues and house officers for their invaluable cooperation throughout the study. We are particularly indebted to Dr. Dalia Ahmed Gassim for her precious time, insightful comments, and unwavering support throughout this project.

ABSTRACT:

Background: Any antibiotic has it's own use and side effects , the misuse of antibiotics may effect the health of patients Antibiotics play a crucial role in managing dental infections; however, inappropriate use can lead to antibiotic resistance, a significant public health concern. Dental professionals are stewards of antibiotic use, and their knowledge and attitudes regarding antibiotic therapy influence prescribing practices.

Objective: The primary objective of this study is to assess the knowledge and attitude about Antibiotic uses and side effects among dental students at Napata College.

Method Cross sectional: study faculty base, in Clinical dental students a in Napata collage in Sudan Study will be done in 55 dental students (all of them from 5th year) The date was collected using self-administered questionnaire, data was analyzed with aid of SPSS V 22

Result:The data reveals a population of 53, predominantly young adults (55% aged 18-25), dealing primarily with viral infections (53%) and preventive dental care (38%). Amoxicillin is the most common antibiotic (74%), though antifungal Clotrimazole is also prevalent (77%). Respondents demonstrate strong awareness of antibiotic resistance risks, but 91% admit to self-medicating. While 96% take medical history before prescribing, concerning practices like weekly antibiotic prescriptions (43%) persist.

Conclusion: The study shows that dental students, while knowledgeable about the importance of proper antibiotic use and antibiotic resistance, may benefit from further education on the detailed mechanisms of antibiotic resistance. This finding highlights a potential gap in their understanding despite an overall good knowledge base.

Table of content:

CHAPTER ONE: INTRODUCTION

Introduction:

Antibiotics have stood as a foundation in the continuous fight against bacterial infections ever since their groundbreaking discovery in the early 20th century. Their unparalleled ability to significantly reduce the morbidity and mortality rates associated with bacterial diseases has positioned them as one of the most pivotal advancements in the view of modern medicine. However, the concerning patterns of antibiotic misuse and overuse have triggered a global health crisis known as antibiotic resistance. This alarming phenomenon shows when bacteria evolve complex mechanisms to withstand the effects of antibiotics that were once successful, resulting in the failure of standard treatment protocols and the emergence of persistent infections, beside the dissemination of resilient bacterial strains. (1)

Napata College in Sudan has well known for its distinguished dental program, carefully designed to supply students with the knowledge and skills necessary to guide the different challenges essential in the field of dental practice. Throughout the strict training regimen, dental students frequently encounter scenarios that call for the prudent use of antibiotics, whether for self-medication or under the guidance of healthcare professionals. Exploring into the patterns of antibiotic utilization among these students, their depth of knowledge regarding these medications, and their attitudes towards antibiotic usage assumes primary importance. This comprehensive assessment not only offers insights into their readiness to responsibly guide antibiotic therapy in their future professional activities but also provides important views on their personal health management practices.

The specter of antibiotic resistance appears ominously, particularly in developing nations where regulations related to antibiotic prescription and distribution may lack Severity, and public awareness regarding the careful use of these medications remains limited. This Reinforces the urgent essential for the application of strong antibiotic management project, Requiring Effort to optimize the utilization of antimicrobial agents. Given their Critical role in prescribing antibiotics for oral health concerns, dental practitioners carry a weighty responsibility in this field. It is mandatory for these practitioners to possess a comprehensive understanding of the correct administration of antibiotics and the potential risks associated with their misuse. (2)

The rational and appropriate use of antibiotics holds huge significance not only for individual health but also for the broader goal of combatting antibiotic resistance on a global scale. The current study is balanced to examine into the knowledge base and attitudes of final year dental students at Napata College concerning their personal antibiotic use. Through the identification of knowledge gaps and the formulation of recommendations aimed at enhancing the educational plan, this research seeks to provide future dental professionals with the necessary skills to carefully manage antibiotic therapy, thereby making a substantial contribution towards advancing public health outcomes and enhancing the global fight against antibiotic resistance. (1)

Justification:

Final year dental students are key to the future of dental practice and healthcare. Their attitudes towards antibiotic use are crucial as they transition to clinical practice, impacting patient health and antibiotic resistance. Assessing their knowledge is vital for educational improvements. Napata College in Sudan is an

ideal setting for this study due to challenges in antibiotic use and resistance. This research at Napata College aims to understand the knowledge and attitudes of final year dental students in addressing these issues.

Problem Statement:

Previous research has identified gaps in dental professionals' knowledge and use of antibiotics. Dentists understand the importance of antibiotics but lack detailed knowledge on indications, dosages, and duration of therapy. Misconceptions exist about antibiotics' role in viral infections and prophylactic use during dental procedures. (3)

Objectives:

General Objective:

The primary objective of this study is to assess the knowledge and attitude about Antibiotic uses and side effects among dental students at Napata College.

Specific Objectives:

1. Evaluating knowledge: To determine the level of knowledge among final year dental students about appropriate antibiotic use, including the indications for use, types of antibiotics, and potential side effects.
2. Assessing attitudes: To evaluate the attitudes of these students towards self-medication with antibiotics, adherence to medical advice, and awareness of antibiotic resistance.
3. To Assess the Knowledge of Final-Year Dental Students about Antibiotic Side Effects.
4. To Evaluate the Attitudes of Final-Year Dental Students towards Managing Antibiotic Side Effects.

5. To Assess the General Attitudes of Final-Year Dental Students towards Antibiotic Stewardship and Continuing Education.

Literature Review:

In dentistry, a variety of antibiotics are used to combat bacterial infections and enhance oral health outcomes. Commonly prescribed antibiotics include penicillins like amoxicillin and penicillin V, effective against a wide range of oral pathogens, while macrolides such as erythromycin and azithromycin serve as alternatives for patients with penicillin allergies. Tetracyclines, like doxycycline, are favored for their anti-inflammatory properties in treating periodontal diseases, and metronidazole is often combined with other antibiotics to address anaerobic infections in the oral cavity. Antibiotics are vital in dentistry for managing conditions like periodontal disease, endodontic infections, peri-implantitis, and postoperative infections, aiding in bacterial eradication, inflammation reduction, and infection prevention. Additionally, they are crucial in prophylactic regimens to prevent bacterial endocarditis during invasive dental procedures. Understanding the diverse types and uses of antibiotics in dentistry is essential for dental practitioners to deliver effective treatment, ensure patient well-being, and uphold responsible antibiotic prescribing practices to combat antibiotic resistance. (4)

Literature Results:

-A study among dental students in India in 2013 by Vinood Kapoor et al found that knowledge about antibiotic use was adequate, but there were gaps in awareness regarding side effects and resistance development. (5)

- A cross-sectional study in Thailand in 2020 by PISARNTURAKIT, Pagaporn Pantuwadee et al revealed that while most respondents had a positive perception and awareness of the rational use of antibiotics, there were instances of antibiotic

use without proper indication and a lack of pharmacological knowledge. The study highlighted that a mobile application was considered the most preferable approach to managing knowledge for rational drug use. (6)

- A study among dental students in Riyadh, Saudi Arabia in 2018 by ABOALSAMH, Abdulrahman, et al. found that 71.7% were familiar with antibiotic resistance. There was no significant difference in antibiotic prescription frequency between junior and senior students for common conditions. Amoxicillin was the preferred choice for most students (88.4%), typically prescribed for 3–5 days (69.2%).(7)

- A study in Lahore, Pakistan in 2022 by BUTT, Hira, et al found that 86.7% of respondents had good knowledge of antibiotic prescription, and 93.3% demonstrated good practices. Most (87.3%) prescribed antibiotics for post-operative prophylaxis. Significant associations were found between knowledge and antibiotic prescription for various conditions, including fever, localized and diffused swelling, root canal treatment, tooth fracture, delayed treatment, and acute pulpitis.(8)

- A study in lebanon in 2018 by MANSOUR, Hicham, et al. found that antibiotics were prescribed in 17.51% of cases, mainly influenced by past use (81.3%). Macrolides were preferred for penicillin allergies (47.4%), and penicillins for pregnant/lactating women. Prophylactic practices varied widely, with low knowledge on antibiotic side effects. The study highlighted dentistry's impact on antibiotic resistance awareness, with 75.9% acknowledging its role and 94.7% aware of resistance causes. (9)

- A study in Jeddah, Saudi Arabia in 2020 by ZAIDI, Syed Faisal, et al. found students had moderate antibiotic knowledge, with 63% at a moderate level. While most recognized antibiotics treat bacteria, over a third mistakenly thought they treat viruses. Awareness of antibiotic resistance was low at 38.8%, and knowledge

of specific antibiotics was limited. Many students believed antibiotics help with colds, despite this being incorrect. The results reveal significant gaps in students' understanding of proper antibiotic use and resistance.(10)

- A study in Italy in 2015 by Scaioli G. et al. showed 20% believed antibiotics could treat viral infections, and 15% stopped antibiotics when feeling better. Females were 1.43 times more likely than males to follow antibiotic prescriptions (95% CI 1.04–1.98). Students with a health-related relative or recent antibiotic use were less likely to misuse antibiotics (OR = 0.69, 95% CI: 0.49–0.97 and OR = 0.38, 95% CI: 0.27–0.53, respectively).(11)

CHAPTER TWO: MATERIAL AND METHOD

Material And Method:

A-Study design: Cross sectional study faculty base

B-Study area and population:

Clinical dental students in 5th final year

C-Sampling technique and sample size: full coverage study.

Study will be done in 53 dental students (from 5th year)in Napata collage.

D-Study subject: the study will be done in clinical dental students excluding the preclinical students in dental faculty in Napata collage

E-Data collection and analysis:Valid Questionnaire will be distributed among study participants after receiving consent

Questionnaire SPSS V 22

Ethical Considerations: This study treated participants with respect, protected their privacy, and ensured their comfort. All information was acknowledged and reported accurately.

Privacy:the information was kept confidential. No one else will be able to identify the information was provided. The data will only be used for this study and then securely deleted.

Safety: This research was designed to be safe for students to participate in. The knowledge and opinions were respected, and weren't criticized or judged.

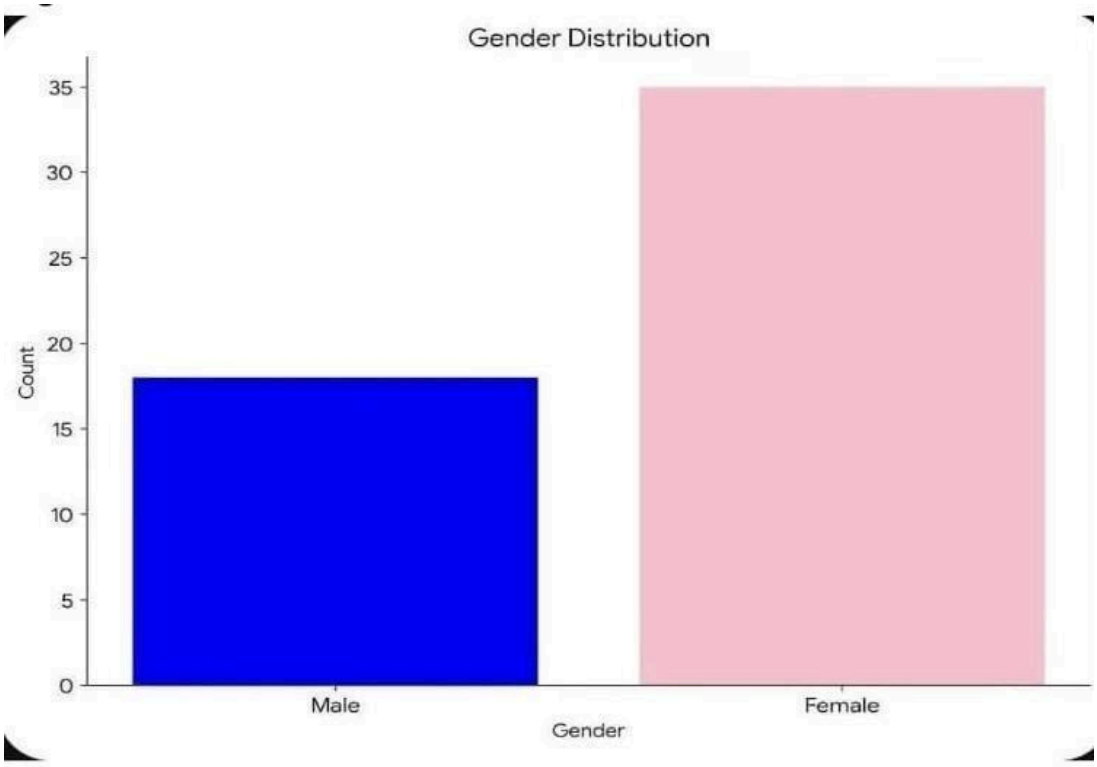
Respect: Students were treated with respect throughout the study and had the freedom to make your own choices.

Clear explanation: students were given a clear explanation of the study before you decided to participate.

Validity: This research aimed to get accurate and trustworthy results. It used multiple sources of information, including real-life experiences from participants,

to understand their perspectives. The questions were designed to be clear and unbiased.

CHAPTER THREE: RESULTS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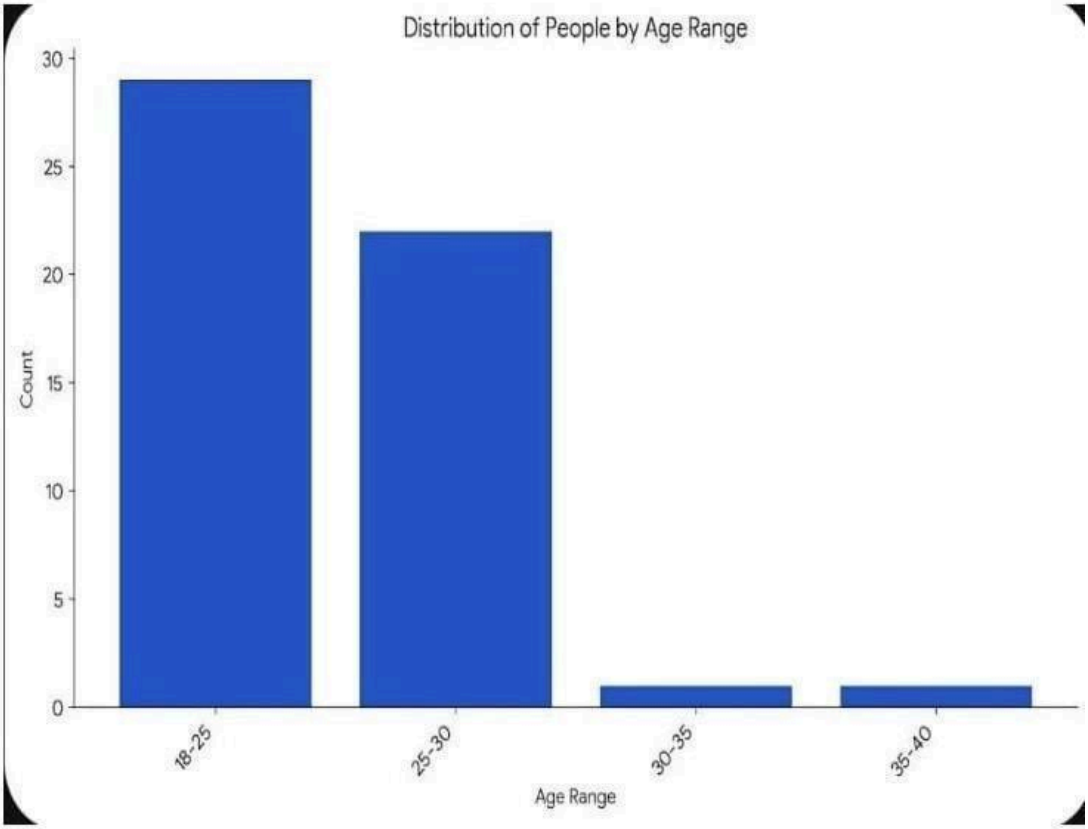
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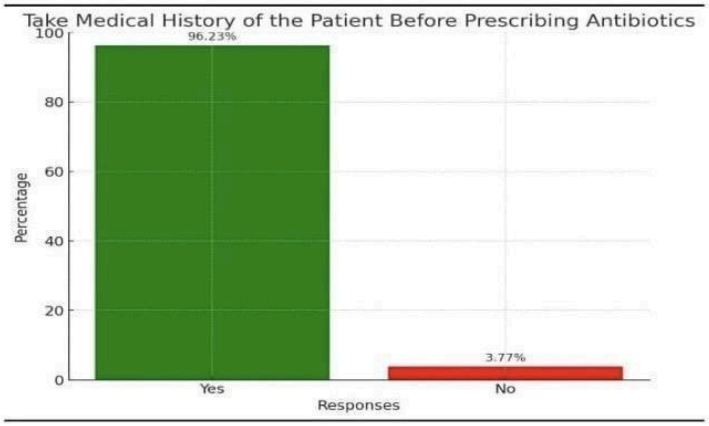
Figure3:11



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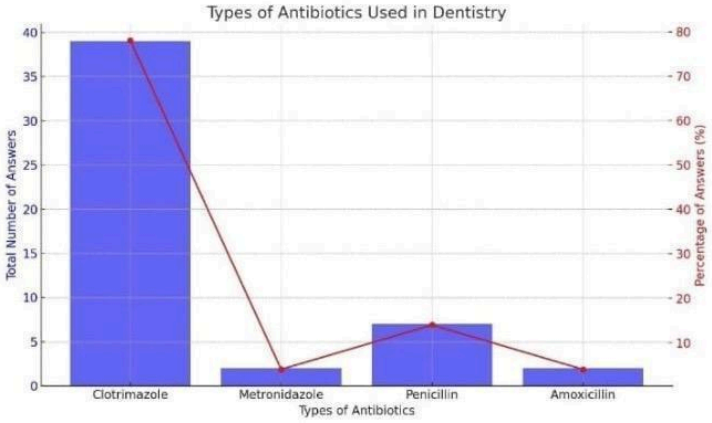


Figure3:8

Most common antibiotic prescribed

ANTIBIOTICS	Count	Percentage (%)
Amoxicillin	39	73.58%
Amoxicillin-Clavulanic Acid	12	22.64%
Penicillin	2	3.77%

Figure3:9

ANTIBIOTICS USE IN DENTISTRY

	Yes	No	Yes (%)	No(%)
Prescribe antibiotic for reversible pulpitis	13	40	24.53%	75.47%
Prescribe antibiotics prior to extraction	25	28	49.06%	50.94%
Prescribe antibiotics for pain	11	42	20.75%	79.25%

Figure3:10

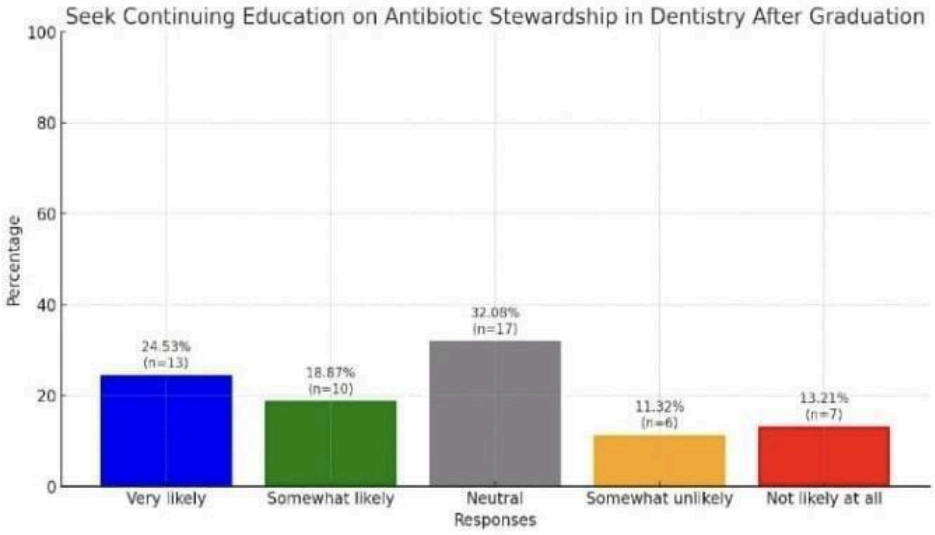
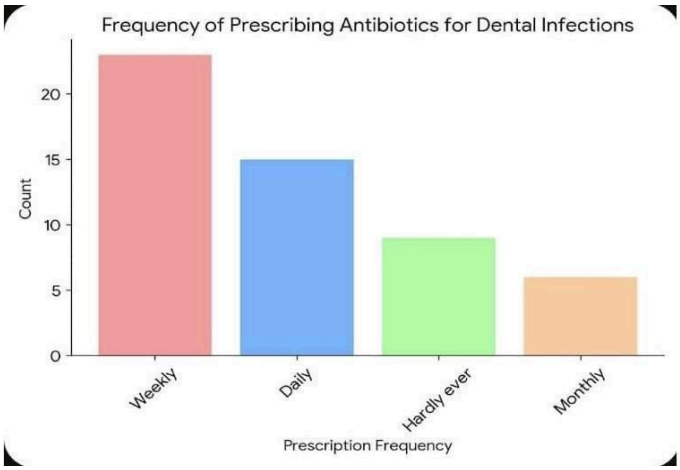


Figure3:7

Strategies	Percentage	Frequency
Raising Awareness of antibiotic Resistance Among Patients	81.25%	26
Increasing access to antibiotics	9.38%	3
Relying more on alternative pain management strategies	9.38%	3
Developing new antibiotics	0.00%	0



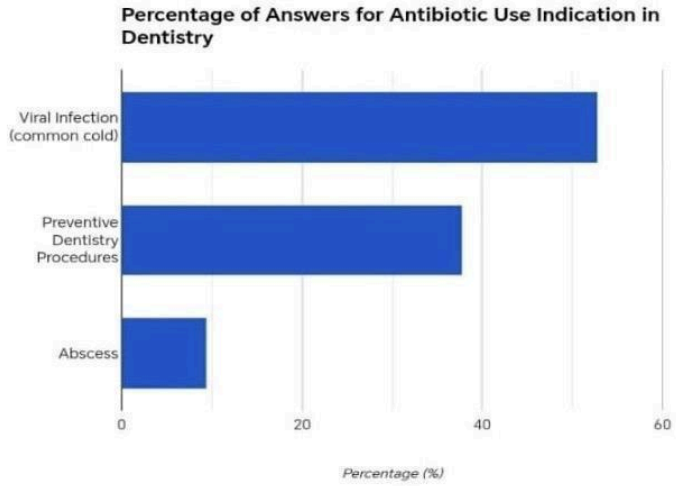


Figure3:5

Knowledge Statement	True (%)	True (Number)	False (%)	False (Number)	Uncertain (%)	Uncertain (Number)	Total
Antibiotics are effective for the treatment of viral infections.	57.14	30	7.14	4	35.71	19	53
Missing an antibiotic dose contributes to antibiotic resistance.	71.43	38	10.71	6	17.86	9	53
Consumption of antibiotics without physician's prescription can contribute to antibiotic resistance.	97.73	52	2.27	1	0.00	0	53

Side Effect	Percentage (%)	Frequency
Development of Antibiotic-resistant bacteria	82.0%	41 occurrences
Upset Stomach	14.0%	7 occurrences
Headache	4.0%	2 occurrences

RESULTS:

The total number of individuals is 53. The age breakdown shows that the majority, 55%, are in the 18-25 age group, followed by 42% in the 25-30 age group, and 2% each in the 30-35 and 35-40 age groups. Looking at the condition breakdown, the most common issue is viral infection (common cold) at 53%, followed by preventive dentistry procedures at 38%. There are also 6% with abscess, while severe periodontal disease is not present in any of the individuals. Finally, 4% did not provide an answer. Overall, the data indicates that the majority of the group is young adults dealing primarily with viral infections and dental preventive measures.

The condition that is not a typical indication is Abscess, which accounts for 6% of the cases. The medication that is not a common type is Clotrimazole (antifungal), comprising 77% of the options. The most concerning potential side effect is the development of antibiotic-resistant bacteria, with 72% of respondents identifying this as an issue. Regarding continuing education, 32% of the participants are neutral on the likelihood of seeking further education, while 25% are very likely to do so.

The single most important issue, in the opinion of the respondents, is raising awareness of antibiotic resistance, with 72% of the participants selecting this option.

Regarding the effectiveness of antibiotics for treating viral infections, 70% of respondents believe this to be false, while 21% think it is true and 9% are uncertain. When it comes to missing an antibiotic dose contributing to antibiotic resistance, 70% correctly identified this as true, 23% said it was false, and 8% were uncertain.

Most respondents, 91%, admitted to consuming antibiotics without a physician's prescription, which is a concerning practice that can lead to antibiotic resistance. In terms of prescription frequency, 43% of participants said their doctors write antibiotic prescriptions on a weekly basis, 28% daily, 17% hardly ever, and 11% monthly.

The most commonly prescribed antibiotic appears to be Amoxicillin, with 74% of respondents identifying it as the most common, followed by Amoxicillin-Calvulinic Acid at 23%. Penicillin was cited by only 4% of participants.

For patients with reversible pulmonary conditions, 75% of respondents said they would not prescribe antibiotics, while 25% said they would. Similarly, for pain management, 79% of respondents indicated they would not prescribe antibiotics, while 21% said they would.

The most common duration for antibiotic prescriptions is 5 days, as indicated by 58% of participants. The next most common durations are 7 days (23%) and 3 days (13%).

When it comes to taking a patient's medical history before prescribing antibiotics, an overwhelming 96% of respondents said they do so, while only 4% reported not taking a medical history.

CHAPTER FOUR: DISCUSSION

DISCUSSION:

Antibiotics have been used in the management and treatment of infectious diseases. It is, therefore, one of the most Commonly prescribed, used, and misuse drugs worldwide This use which could be indiscriminate has been viewed as a key factor for the emergence of antibiotic resistance ...Antibiotics are available without prescription and so individuals use it indiscriminately. General population should be instructed and educated and the health care providers should be told about antibiotic resistance and its dangerous consequences Adequate importance should be given to antimicrobial chemotherapy and the antimicrobial resistance (AMR) issues during undergraduate training. For successful and sustained intervention, knowledge, attitudes and practice (KAP) toward these aspects should be modified. The effects of antibiotics extend beyond just treating infections; They can also prevent the spread of disease and mitigate complications associated with bacterial infections. However, their use comes with challenges, such as the potential for side effects and the growing issue of antibiotic resistance. Misuse and overuse of antibiotics can lead to the development of bacterial resistance mechanisms, making infections more difficult to treat and posing a major threat to public health, especially oral health and diseases such as dental abscesses, mouth ulcers, and severe periodontitis.They are also used preventively in certain scenarios, such as before surgical procedures such as tooth extraction. Understanding the proper use of antibiotics is essential to maximize their benefits while minimizing risks, and ensuring they remain effective. Tools in our fight against bacterial diseases.

●Uses of antibiotics in dentistry:

As we mentioned the most commonly used antibiotic in dentistry was amoxcillin at a rate of 73.58%, penicillin at a rate of 3.77%, and amoxcillin clavulanic acid at a rate of 22.64%. The reason is the effectiveness and safety of the antibiotic.

A study among dental students in Riyadh, Saudi Arabia in 2018 by Abu Al-Samh, Abdul-Rahman, et al. It was found that 71.7% were aware of antibiotic resistance. There was no significant difference in antibiotic prescribing between students and common cases. Amoxicillin was the preferred choice for students (88.4%), and was prescribed for 3-5 days (69.2%).(7

Amoxicillin is commonly used in dentistry for several reasons:Broad Spectrum: It covers a wide range of bacteria commonly found in oral infections, including Streptococcus species and anaerobic bacteria.Effectiveness: Amoxicillin is effective against many dental infections, such as periodontitis (gum disease) and dental abscesses.Safety Profile: It is generally well-tolerated and has a low incidence of serious side effects when used appropriately.Accessibility: Amoxicillin is widely available and affordable, making it convenient for both patients and healthcare providers.Prophylaxis: It is also used as prophylaxis before certain dental procedures in patients at risk of bacterial endocarditis, following guidelines from organizations like the American Heart Association These results and indicators were available in amoxicillin and for these reasons we used it more than others These answers were based on approved studies such as American Dental Association (ADA): They provide guidelines and recommendations for antibiotic use in dentistry, including indications for amoxicillin.Centers for Disease Control and Prevention (CDC): They offer guidance on antibiotic stewardship and infection control practices, which are relevant to dental professionals.

●<u>The effect of antibiotics and awareness in dentistry:</u>

As we discussed in the research, the rate of 81.25% about the amount of awareness and guidance about antibiotics, the result was that the awareness rate in dentistry must increase and that we have instructions about inappropriate or incorrect use, and the rate of consumption of antibiotics without a prescription

was high at 97.73. %, so one must be aware of the risks. Antibiotics and their resistance

A study in Jeddah, Saudi Arabia in 2020, prepared by Al-Zaidi, Sayed Faisal, and others. It found that students had average knowledge of antibiotics, with 63% of them at an intermediate level. While most known antibiotics treat bacteria, more than a third mistakenly believe they treat viruses. Awareness of antibiotic resistance was low at 38.8%, and knowledge of specific antibiotics was limited. Many students believe that antibiotics help treat colds, although this is not true. The results reveal significant gaps in students'understanding of the proper use and resistance of antibiotics.

We, as dentists, must have sufficient attention and adequate information to protect against the harm of antibiotics so that they are not used with a lack of awareness.Because incorrect use of antibiotics leads to significant risks that must be taken into account, such as:

Antibiotic Resistance: Overuse or misuse can lead to bacteria becoming resistant, reducing the effectiveness of these drugs in treating infections.Allergic Reactions: Some patients may experience allergic reactions to antibiotics, ranging from mild rashes to severe anaphylaxis.Gastrointestinal Issues: Antibiotics can disrupt the balance of normal gut bacteria, potentially causing nausea, diarrhea, or other digestive problems.Superinfections: Disruption of normal flora can lead to secondary infections by opportunistic organisms, such as yeast infections.Drug Interactions: Antibiotics may interact with other medications a patient is taking, affecting their efficacy or causing adverse effects.Impact on Natural Microbiota: Long-term use can affect the balance of microorganisms in the mouth and gut, potentially leading to other health issues.Dentists must weigh these risks carefully and prescribe antibiotics only when truly necessary.Oral conditions that present to dental clinics are mostly inflammatory conditions which necessitate operative

interventions, rather than infectious processes that would benefit from antibiotics [20]. In dentistry, situations that require antibiotic therapy are limited to oral infections accompanied by fever, lymphadenopathy, and trismus [21]. Our study found that dental students in our sample would routinely prescribe antibiotics for conditions that, according to guidelines, do not require them, and which could be managed with operative measures alone [22]. For example, antibiotics were deemed necessary by students for periapical abscess (65.7%), dry socket (37.1%), and pulpitis (25.6%), all of which are conditions which are routinely treated without them Examples of conditions which have been found to benefit from treatment plans rather than antibiotics include pulpitis and necrotic pulp, for which root canal therapy is considered the standard of care. Antibiotics are frequently prescribed for such conditions although, according to guidelines, their benefit is unproven [17]. A similar situation exists for the commonly encountered situation of dry sockets (alveolar osteitis), which is essentially not an infection and is thus not expected to improve with antibiotics, yet they are frequently prescribed for it This study revealed a high percentage of dental students and internationals demonstrated knowledge about current guidelines for antibiotic prophylaxis and prescription. Previous similar studies in Saudi Arabia, however, have indicated a lack of adequate knowledge [13,15]. The majority of participants in the present study showed a good understanding of antibiotic resistance. This finding was also higher than that reported in another Saudi study [16]. Most oral conditions encountered in dental clinics are inflammatory in nature and typically require operative interventions rather than antibiotics. Despite guidelines suggesting that antibiotics are unnecessary for these conditions, they are often prescribed, although their actual benefit remains uncertain [20]. For reversible pulpitis, irreversible pulpitis, and dry sockets, the majority of participants reported not prescribing antibiotics, and this aligns with the recommended

approach. However, previous research has shown that antibiotics are frequently prescribed for these conditions Antibiotic resistance impacts dentists in several ways:Treatment Challenges: Dentists may face difficulties treating infections if common antibiotics are ineffective, requiring alternative or more aggressive treatments.Increased Risk of Complications: Resistant infections can lead to more severe complications, extending treatment time and increasing the risk of systemic spread.Need for More Diagnostic Work: Dentists might need to conduct more tests to identify the specific bacteria and choose an effective treatment, increasing the complexity and cost of care.Increased Costs: Treating resistant infections often requires more expensive antibiotics or advanced interventions, raising the overall cost of dental care.Patient Safety: The risk of treatment failure or prolonged infection can compromise patient safety, requiring careful monitoring and management.Addressing antibiotic resistance involves judicious use of antibiotics, patient education, and ongoing research to develop new treatments.

Distribution of periods of antibiotics prescribed for children. We had 5 prescribed number of days, so we must take caution due to increased doses or failure to regulate the periods of taking antibiotics

Using antibiotics in children, particularly in a dental setting, carries several risks:Allergic Reactions: Children may experience allergic reactions to antibiotics, which can range from mild rashes to severe anaphylaxis.Gastrointestinal Disturbances: Antibiotics can cause side effects like nausea, vomiting, or diarrhea, which can be more pronounced in children.Disruption of Normal Flora: Antibiotics can disturb the natural balance of bacteria in the body, leading to conditions like oral or gastrointestinal yeast infections.Antibiotic Resistance: Overuse or inappropriate use of antibiotics in children can contribute to antibiotic resistance, complicating future

treatments.Developmental Effects: Some antibiotics might affect the development of the child's gut microbiome, which is crucial for overall health.Drug Interactions: Children may be on other medications, and antibiotics can interact with these, potentially causing adverse effects or reducing efficacy.Careful consideration and appropriate use of antibiotics are essential to minimize these risks while addressing the child's dental needs

Conclusion:

Despite overall good knowledge, there could be areas where students need further education, such as the detailed mechanisms of antibiotic resistance Dental students generally have a good understanding of the basic principles of antibiotic use, including the need for appropriate prescriptions and awareness of antibiotic resistance

Recommendations:

1.Awareness and guidance among dental students must be increased

2.Do not overuse antibiotics for reasons of avoiding danger and its effects

3.Use safe and effective antibiotics

4.Factors like lack of knowledge, uncertain diagnosis,parental, and patient pressure have been considered leading to increased use of antibiotics

5.Clearer nationwide guidelines are required for effectiveunderstanding of the indications of antibiotic

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