



Antibiotic Prescription Patterns For Endodontic Procedures Among Dentists Of Gujarat, India: A Questionnaire Based Survey

¹Dr. Ruchika Nahar*, ²Dr. Kamal Bagda, ³Dr. Mihir Pandya,

⁴Dr. Akash Azad, ⁵Dr. Shraddha Gajjar, ⁶Dr. Het Ghodasara

²Head of Department, ³Professor, ⁴Associate Professor, ^{1,5,6}Post Graduate Student

Department of Conservative Dentistry and Endodontics, Goenka Research Institute Of Dental Science, Gandhinagar, India, Pin – 382610

***Corresponding Author:**

Dr. Ruchika Nahar

Department of Conservative Dentistry and Endodontics,
Goenka Research Institute of Dental Science, Gandhinagar, Gujarat, India

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Aim The use of antibiotics in dentistry is characterized by empirical prescription of medicines based on clinical infectious diseases, causing the use of antibiotics to become widespread in a short time. This situation leads to the development of antibiotic resistance in many diseases, making most antibiotics ineffective. However, when the disease spreads throughout the body, the dentist can make a difference by deciding the use of antibiotics (determining the right drug, its dose and necessary treatment. Dentists can make a difference by the judicious use of antimicrobials – prescribing the correct drug, at the standard dosage and appropriate regimen – only when systemic spread of infection is evident. There is a rising concern for antibiotic resistance worldwide, the primary cause of which is overuse and misuse. Hence, it is important to increase the awareness about all the aspects of antibiotics prescription. The objective of this study is **to evaluate the knowledge and awareness of Antibiotic prescription patterns for endodontic procedures among dentists**. The present study was done among the dental practitioners, post graduate students and interns in Gujarat. A questionnaire was made and given to the dentist to check their knowledge and awareness about antibiotics.

Materials and Methods: Around 111 dental professionals were interviewed through a questionnaire. Those interviewed included an equal number of dental interns, postgraduates, and practitioners.

Results and Discussion: Once resistance is formed, reversal of it is impossible, but we shall minimize the development of new resistant strains by proper use of antibiotics. Factors such as inappropriate dosing, duration, and prophylaxis may contribute to the development of resistant strains. The current study found antibiotic misuse to some extent by prescribing them for pain relief, reversible pulpitis, irreversible pulpitis, and endodontic flareups.

Conclusion: These surveys conclude that current knowledge on antibiotic resistance among dentists is still reduced. So, the overall perception of the general dentists towards antibiotic prescription pattern in Gujarat needs to be gauged.

Keywords: Dentists, Gujarat, Antibiotics, Survey, Questionnaires

Introduction

Antibiotics were introduced in the late 1920s. These life-saving medicines should be used appropriately, or they would result in the development of resistance. Unfortunately, antibiotic over-prescription has resulted in the development of newer strains of bacteria that are resistant to these antibiotics. A large number of antibiotics that were effective in the past are not prescribed nowadays because of the development of resistance.¹ Endodontic conditions, such as symptomatic reversible and irreversible pulpitis, pulpal necrosis, acute apical periodontitis, acute apical abscess with no systemic involvement, and chronic apical abscess, do not require antibiotic coverage.⁷ Despite these facts, there has been a tendency to prescribe antibiotics for this conditions.⁸ This survey was conducted to know about the awareness of intraoral scanners among dental practitioners, post-graduate students & interns of Gujarat.¹

Materials And Method:

Around 111 dental professionals were interviewed through a questionnaire. Those interviewed included an equal number of dental interns, postgraduates, and practitioners. They were interviewed on a google form. Knowledge was assessed on a two-point scale: Yes, No. The proforma comprised of two sections. The first section collected to demographic details of the participants like name, E-mail id, gender and category and the second part comprised 13 questions which are as follows:

- 1) How many patients on average do you handle in your daily practice?
- 2) Percentage of patients who are prescribed systemic antibiotics every day?
- 3) Which of the following antibiotics is the most commonly prescribed one?
 - Amoxicillin
 - Metronidazole
 - Doxycycline
 - Clindamycin
 - Azithromycin
 - Ciprofloxacin
- 4) Choose one among the following factors based on which you prescribe antibiotics.
 - Pain relief
 - Reversible pulpitis
 - Irreversible pulpitis
 - Endodontic flareups
 - Dentoalveolar abscess
 - Trauma (Replantation after avulsion)
- 5) Choose one among the following factors based on which you prescribe antibiotics.
 - To prevent flare-ups after root canal treatment
 - Size of the swelling
 - Based on radiological findings like periapical lesions
 - Systemic diseases
- 6) Do you prescribe antibiotics prior to surgery prophylactically?
 - Yes
 - No
- 7) Do you advise antibiotic culture tests for your patients?
Yes
No
- 8) Do any of your patients haven't responded to the antibiotics that you've prescribed?
 - Yes
 - No
- 9) If yes in the above question, what is the reason for not responding to antibiotics?
 - Not sensitive
 - May require a better anti-inflammatory to reduce clinical symptoms
 - The patient might have developed tolerance toward the drug
 - Systemic factors might have resulted in a need for increased dosage

10) Any combinations of antibiotics/local antibiotics you use for synergistic effects?

- Yes
- No

11) Do you prescribe the drugs based on the drug dosage formula, half-life, and weight of the patient?

- Yes
- No

12) Do you upgrade yourselves with the new guidelines or updates regarding antibiotic usage?

- Yes
- No

13) Have you attended or listened to any CDE programs with regard to antibiotic resistance?

- Yes
- No

The responses were compiled, computed and analysed for agreement or otherwise between and within the groups.

Results:

Of 111 dentists included, **26.1%** were males while **73.9%** were females.

Chart 1: shows Category of the participants

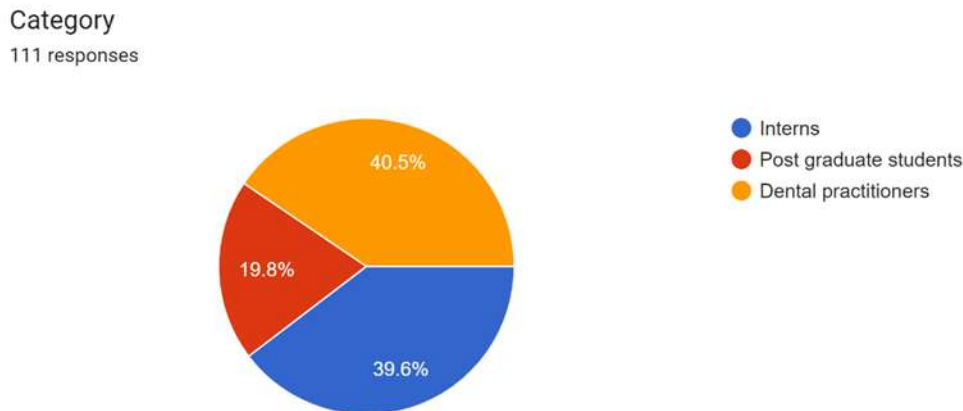


Chart 2: shows average number of patients handled by the participants daily

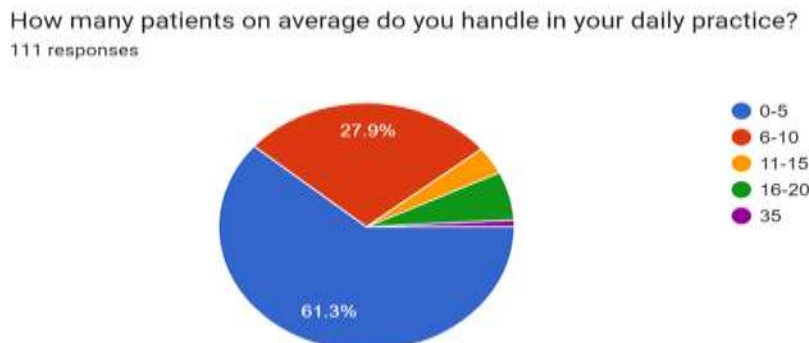
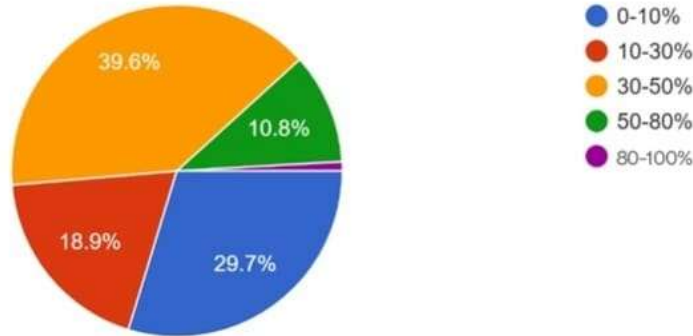


Chart 3: shows percentage of patients who are prescribed antibiotics every day

Percentage of patients who are prescribed systemic antibiotics every day.

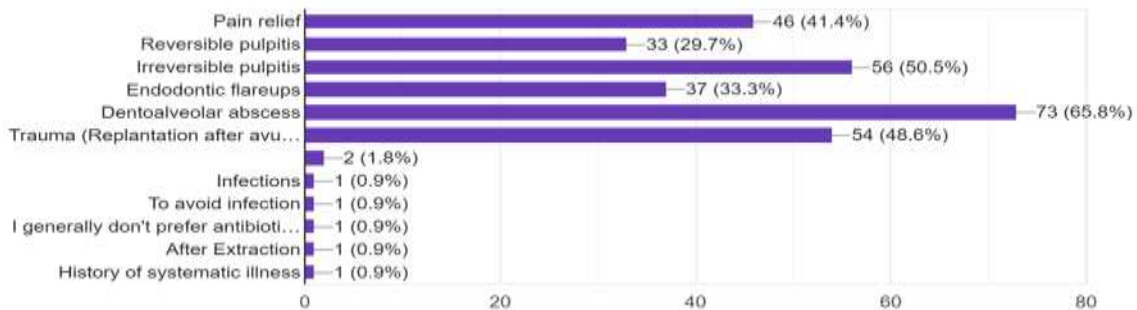
111 responses



Graph 1: shows conditions in which antibiotics are prescribed by the participants

What are the following conditions do you prefer to prescribe antibiotics?

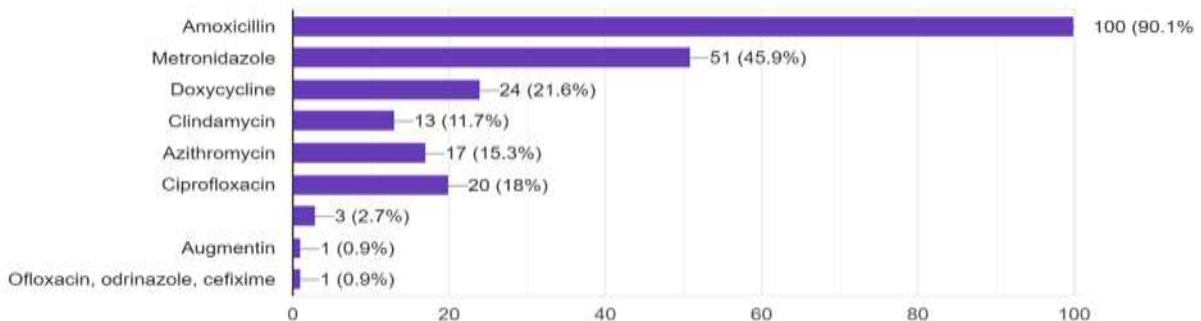
111 responses



Graph 2: shows most commonly prescribed antibiotics by the participants

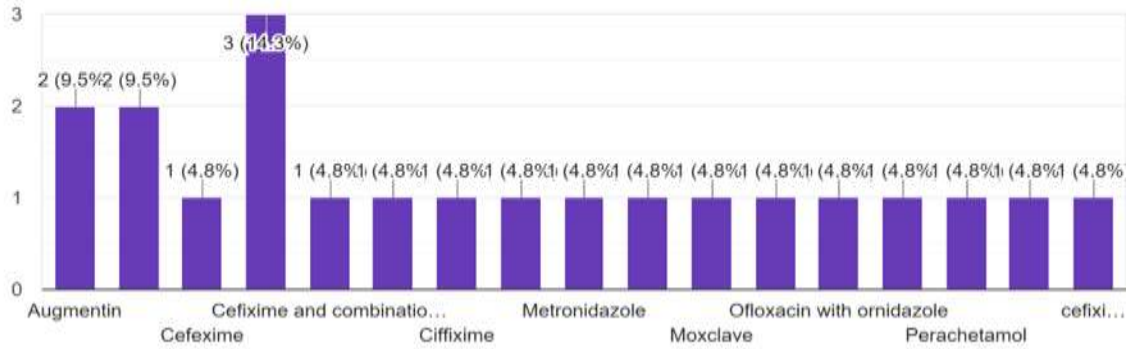
Which of the following antibiotics is the most commonly prescribed one?

111 responses



Graph 3: shows other prescribed antibiotics by the participants than in the Graph 2

If any other Antibiotics in the above question, write it's name
21 responses



Graph 4: shows factors based on which antibiotics are prescribed by the participants

Choose one among the following factors based on which you prescribe antibiotics.
111 responses

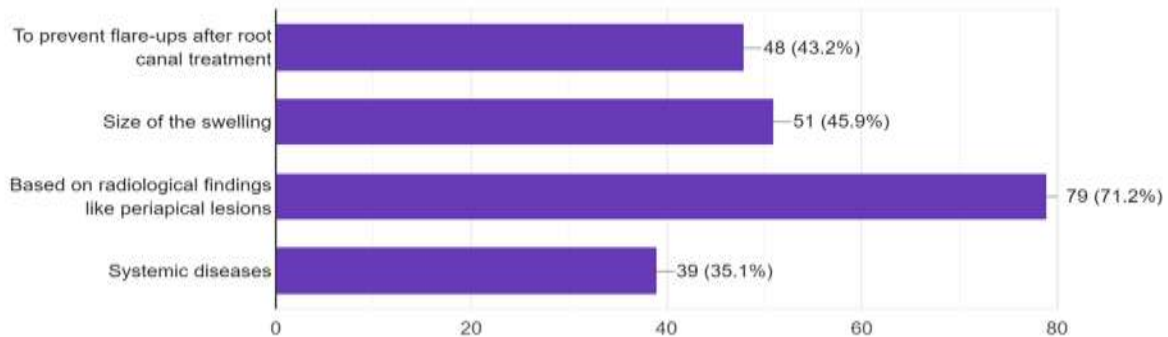


Chart 4 : shows percentage of participants who prescribe/ do not prescribe antibiotics to surgical conditions prophylactically

Do you prescribe antibiotics prior to surgery prophylactically?
111 responses

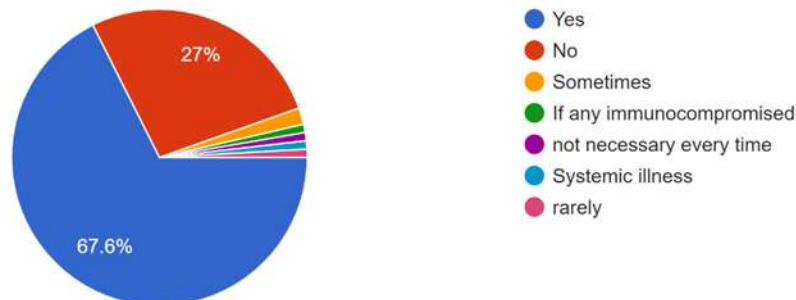


Chart 5: shows percentage of participants who advise antibiotic culture tests

Do you advise antibiotic culture tests for your patients?

111 responses

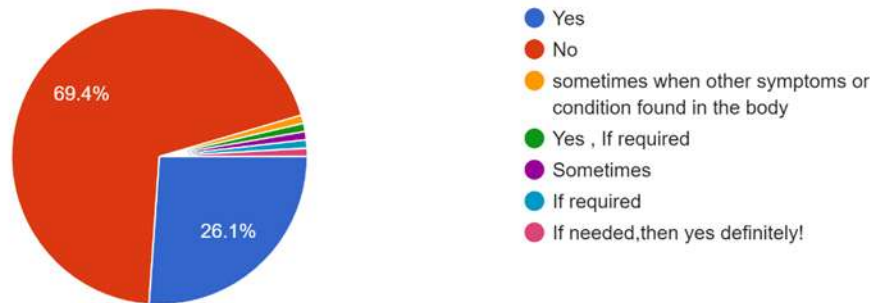


Chart 6: shows percentage of patients self-prescribing antibiotics

Have your patients ever self-prescribed antibiotics?

111 responses

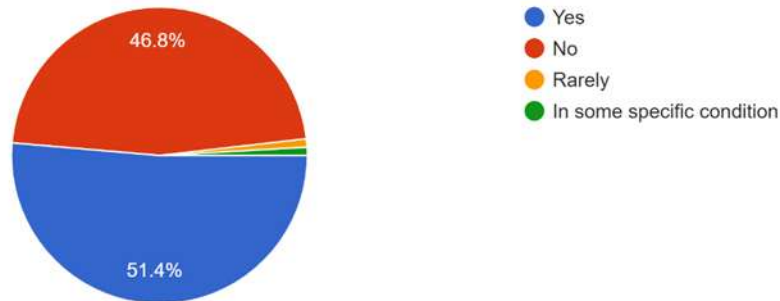
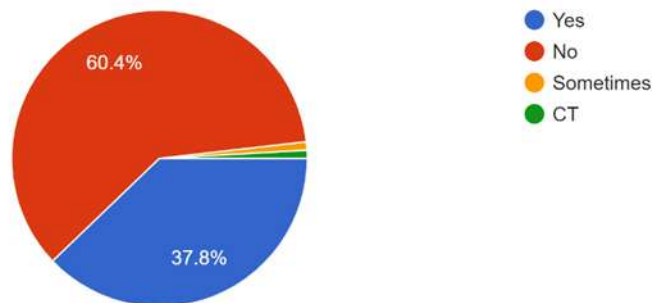


Chart 7: shows percentage of patients not responding to prescribed antibiotics by the participants

Do any of your patients haven't responded to the antibiotics that you've prescribed?

111 responses



Graph 5: shows reasons given by the participants for patients not responding to antibiotics

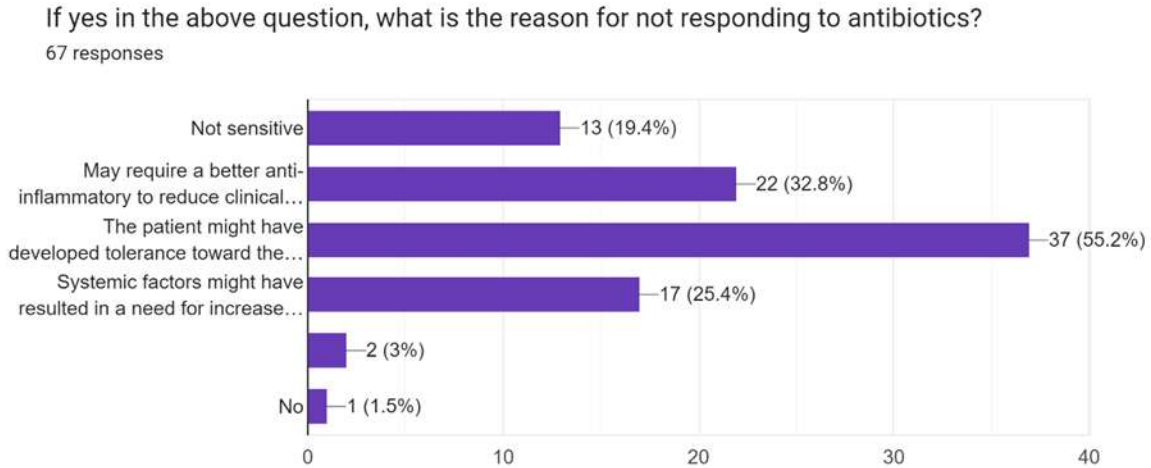


Chart 8: shows use of combinations of antibiotics by the participants for synergistic effects

Any combinations of antibiotics/local antibiotics you use for synergistic effects?
111 responses

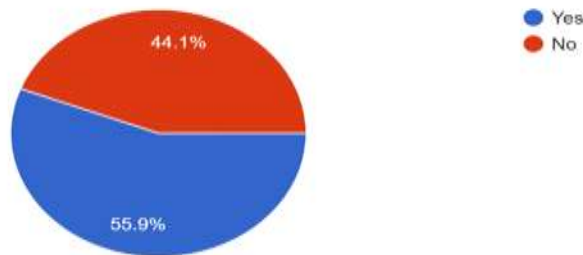


Chart 9: shows prescription based on drug dosage formula, half- life and weight of the patient

Do you prescribe the drugs based on the drug dosage formula, half-life, and weight of the patient?
111 responses

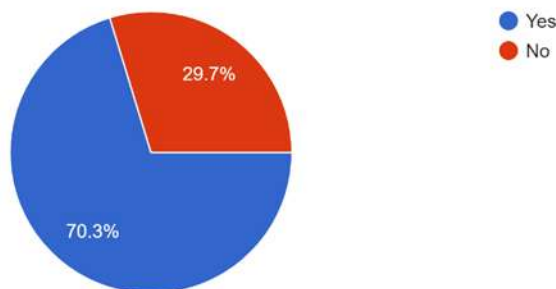


Chart 10: shows percentage of participants upgrading themselves with new guidelines regarding antibiotic usage

Do you upgrade yourselves with the new guidelines or updates regarding antibiotic usage?
111 responses

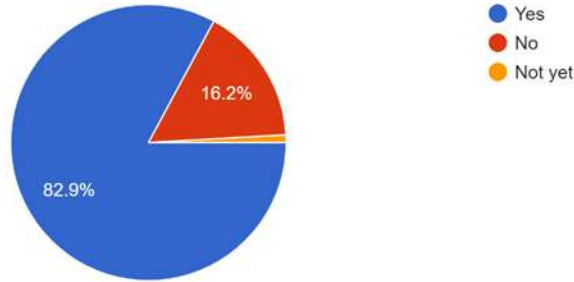
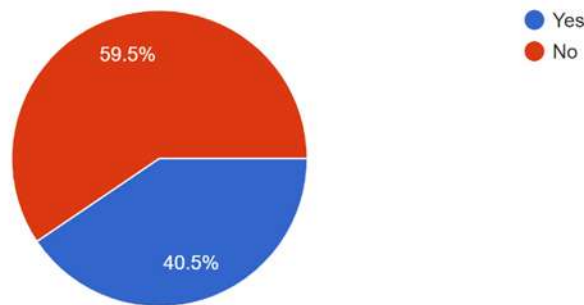


Chart 11: shows percentage of participants attended or listened to any CDE programs regarding antibiotic resistance

Have you attended or listened to any CDE programs with regard to antibiotic resistance?
111 responses



Limitations:

A critical limitation of this research is that this study is questionnaire predicated and knowledge and awareness of antibiotic prescription may not be neat charged by this method. The answers may exist subject to bias.

Discussion:

Studies have reported that about 10 million deaths would occur per year globally by 2050, which makes drug resistance a curse of the medical profession unless sustained actions are not taken.⁹ Various contributing factors for antimicrobial resistance include inappropriate antibiotic prescription by medical or dental practitioners.

Once resistance is formed, reversal of it is impossible, but we shall minimize the development of new resistant strains by proper use of antibiotics. Factors such as inappropriate dosing, duration, and prophylaxis may contribute to the development of resistant strains. According to a systematic review by James et al., antibiotics were not essential for irreversible pulpitis and pain relief.¹⁰ In line with this, the current study found antibiotic misuse to some extent by prescribing them for pain relief, reversible pulpitis, irreversible pulpitis, and endodontic flareups. The guidelines of the American Dental Association state that antibiotic usage for dental conditions must be limited to situations only when there is systemic involvement and immediate, definitive as well as conservative dental treatment should be performed in all cases.¹¹

About 90.1 % of participants chose Amoxicillin as the first line of drug, followed by metronidazole. This is consistent with the study done by Maslamani et al.¹² Amoxicillin, a synthetic improvement of the penicillin molecule, is readily absorbed when taken with food and is resistant to damage by stomach acid. However, amoxicillin has a broad spectrum of activity compared with penicillin.¹³ Metronidazole has been suggested to be taken with amoxicillin due to its very good activity against anaerobes.¹⁴

The 2017 AAE guidelines regarding antibiotic prophylaxis given recommend prescribing antibiotics for diabetic patients with poor glycemic control. The ESE position statement that was given on the use of antibiotics in endodontics recommends antibiotic prophylaxis in medically compromised patients with acute apical abscess and those cases with systemic involvement, progressive infections, replantation of avulsed teeth (permanent teeth), soft tissue trauma. The American Heart Association (AHA) 2007 guidelines, which were revised from earlier ones for cardiac conditions, state that antibiotic prophylaxis is essential only for patients with high-risk infective endocarditis, and this prophylaxis is essential for dental procedures that involve the handling of gingival tissues, oral mucosa, or periapical part of teeth. In addition, the AHA's recent 2021 scientific update recommends antibiotic prophylaxis in cases with prosthetic cardiac valve/material, congenital heart disease, and cardiac transplant recipients who develop cardiac valvulopathy.³

In addition, 59.5% of dentists have not regularly attended CDE programs with regard to antibiotic resistance.

The endodontic flareups shall be prevented by following the proper working length of the tooth being prepared, thereby preventing apical extrusion of debris.³

Future Directions:

A great challenge for the endodontic specialty in the near future is to use the outstanding knowledge of the biological aspects of endodontic diseases to find the best way to treat them.

Conclusion:

The current study reveals that the dental students and practitioners many dentists prescribed antibiotics for

pain control and in reversible/irreversible pulpitis. More education on appropriate antibiotic prescription is needed for college students. Patients

should be warned about the side effects of self-administered antibiotics. Furthermore, the importance of initiating awareness programs among the patients should not be overlooked.

Acknowledgments:

I would like to thank our Head of the Department, department of Conservative Dentistry and Endodontics, Dr. Kamal Bagda MDS, Dr. Mihir Pandya MDS and Professor, Dr. Akash Azad MDS and Associate Professor for helping me in completing this survey.

References:

1. Oberoi SS, Dhingra C, Sharma G, Sardana D. Antibiotics in dental practice: how justified are we. *Int Dent J*. 2015 Feb;65(1):4-10.
2. Garg AK, Agrawal N, Tewari RK, Kumar A, Chandra A. Antibiotic prescription pattern among Indian oral healthcare providers: a cross-sectional survey. *J Antimicrob Chemother*. 2014 Feb;69(2):526-8.
3. Vengidesh R, Kadandale S, Ramachandran A, Srinivasan S, Parthasarathy R, Thanikachalam Y, Kumar P. Antibiotic Prescription Patterns for Endodontic Procedures in India: A Knowledge, Attitude, and Practices (KAP) Survey. *Cureus*. 2023 Apr 18;15(4):e37804.
4. Havard, Drew B., and J. Michael Ray. "How can we as dentists minimize our contribution to the problem of antibiotic resistance?." *Oral and Maxillofacial Surgery Clinics* 23.4 (2011): 551-555.
5. Sweeney LC, Dave J, Chambers PA, Heritage J. Antibiotic resistance in general dental practice--a cause for concern? *J Antimicrob Chemother*. 2004 Apr;53(4):567-76.
6. Baumgartner JC, Xia T. Antibiotic susceptibility of bacteria associated with endodontic abscesses. *J Endod*. 2003 Jan;29(1):44-7.
7. Segura-Egea JJ, Gould K, Şen BH, Jonasson P, Cotti E, Mazzoni A, Sunay H, Tjäderhane L, Dummer PMH. Antibiotics in Endodontics: a

- review. *Int Endod J*. 2017 Dec;50(12):1169-1184.
8. Parekh, Amisha N., et al. "Antibiotics usage, how well we know it? KAP survey among the dentist population in Mumbai." *Int J Basic Clin Pharmacol* 9 (2020): 1713.
 9. No time to wait: securing the future from drug-resistant infections. Report to the secretary-general of the United Nations. 2019; 1:28.
 10. Current trends in prescription of antibiotics among dentists working in various dental colleges of Bengaluru City, India a cross sectional study. Naveen NG, Suhas PG, Vanishree N, Patnaik S, Bharath C, Prasad KS, Bullappa KS.
 11. Lockhart PB, Tampi MP, Abt E, Aminoshariae A, Durkin MJ, Fouad AF, Gopal P, Hatten BW, Kennedy E, Lang MS, Patton LL, Paumier T, Suda KJ, Pilcher L, Urquhart O, O'Brien KK, Carrasco-Labra A. Evidence-based clinical practice guideline on antibiotic use for the urgent management of pulpal- and periapical-related dental pain and intraoral swelling: A report from the American Dental Association. *J Am Dent Assoc*. 2019 Nov;150(11):906-921.e12.
 12. Maslamani M, Sedeqi F. Antibiotic and Analgesic Prescription Patterns among Dentists or Management of Dental Pain and Infection during Endodontic Treatment. *Med Princ Pract*. 2018;27(1):66-72.
 13. Slots J. Selection of antimicrobial agents in periodontal therapy. *J Periodontal Res*. 2002 Oct;37(5):389-98.
 14. Yingling NM, Byrne BE, Hartwell GR. Antibiotic use by members of the American Association of Endodontists in the year 2000: report of a national survey. *J Endod*. 2002 May;28(5):396-404.