

# KNOWLEDGE, AWARENESS AND PRACTICE AMONG UNDERGRADUATE DENTAL STUDENTS ON USAGE OF ANTIBIOTICS FOR ENDODONTIC TREATMENTS

<sup>1</sup>V.A Muralidharan, <sup>2</sup>Sindhu Ramesh, <sup>3</sup>Dr.Gheena.S

<sup>1</sup>Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India

<sup>2</sup>Professor, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and technical Sciences, Saveetha University, Chennai, India

<sup>3</sup>Associate Professor, Department of Oral Pathology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and technical Sciences, Saveetha University

[151901017.sdc@saveetha.com](mailto:151901017.sdc@saveetha.com)

[sindhuramesh@saveetha.com](mailto:sindhuramesh@saveetha.com)

[gheena@saveetha.com](mailto:gheena@saveetha.com)

## ABSTRACT

Endodontic infection is the infection of the root canal system and the microorganisms play a tremendous role in pulpal and periapical disease. The primary aim of endodontic treatment is to remove as many bacteria as possible from the root canal system. This can be achieved by a combination of local and systemic use of antibiotics. The use of antibiotics in dentistry especially in endodontics has become a practice towards inappropriate prescription and overdose leads to adverse side effects and bacterial resistance. An undergraduate student will have only limited knowledge in this regard. The aim of this study was to determine the knowledge, attitude and perception on usage of antibiotics among undergraduate students for endodontic therapy. This present study is a cross-sectional, descriptive questionnaire study conducted among dental undergraduate students in Chennai, India. The study was conducted from March to April 2020. A descriptive questionnaire study was conducted among 320 dental students in the city. A structured questionnaire was prepared focussing on antibiotics indication in dentistry particularly in endodontic treatment. Assessment of subjects awareness and attitude towards use of antibiotics for patients after endodontics procedures included in the questions relating to the knowledge of the basic antibiotics regime and its course. The subjects were requested to respond to each item in the specific format given. All the participants were allowed to choose one of the given three to four choices for each item in the questionnaire. A large population of students of 320 were familiar with this antibiotic resistance. Compared with the juniors, the senior students have a wider knowledge for prescribing antibiotics for various endodontic procedures. Most of the students prescribed Amoxicillin (30.82%) for any endodontic treatment for a duration of three days (26.42%) compared to other antibiotics. This study concludes that undergraduate dental students may prescribe antibiotics inappropriately and hence a proper and extensive guideline must be given to them to be followed. A thorough knowledge and awareness must be there on the antibiotic regime and its usage to all students before entering their clinics.

**Keywords:** Knowledge, awareness, endodontic, Kap survey, antibiotic resistance.

## INTRODUCTION

More than 700 species of microorganisms with 11 divisions have been identified in a human oral cavity. (Ramaprabha and Dr., 2020) Antibiotics have revolutionized, since the discovery of penicillin in 1928 by

Fleming. For many decades, antibiotics are prescribed in numerous dental procedures.(Abbott, 2000) During endodontic treatment, antibiotics may be given systemically or regionally [i.e., intra-dental use]. Systemic antibiotics should be used to treat dental infections on the basis of a defined indication.(Miles and Michael Huberman, 1984)

Antibiotics are an important class of drugs. Clearly, the benefits of correct use of antibiotics include the resolution of infection, prevention of the spread of disease and minimization of serious complications of disease. Up to 50% of all antibiotics are prescribed or used incorrectly. Risks associated with the use of antibiotics include nausea, vomiting, diarrhea and stomach cramps because of the disturbances of the gut microflora. Antibiotic resistance is the most globally faced issue and menacingly spreading its tentacles day by day. It has reached an alarming portion in developing countries. (Vila-Farrés, Giralt and Vila, 2012) Antibiotic resistance occurs when bacteria change in response to the use of these medicines.

The world urgently needs to change the way it prescribes and uses antibiotics. Even if new medicines are developed, without behaviour change, antibiotic resistance will remain a major threat. Antibiotics have been extremely valuable in addition to the armamentarium (Ramanathan and Solete, 2015) available to the health practitioners for the management of bacterial infections. (Bansal, Gupta and Nehra, 2018) But in recent times it has been reported that 50 percent of the antibiotics are indiscriminately misused. (Ulldemolins *et al.*, 2010)(Siddique *et al.*, 2019) It is not always prescribed, there are certain usage guidelines for the usage of antibiotics (Manohar and Sharma, 2018), particularly in Endodontic treatment (R, Rajakeerthi and Ms, 2019) known as AAE guideline format. Antibiotics can be used as an adjunct to endodontic treatment in a number of ways — locally, systemically and prophylactically. The local or intra- canal use of antibiotics in the form of medicaments is common. However, the commercially available agents for this purpose may not be the ideal mixtures. Prophylactic use of antibiotics has been recommended for patients ‘at risk’ of infective endocarditis, in some pre- surgical situations and following avulsion and replantation of teeth. The tendency towards indiscriminate antibiotic use should be discouraged. The use of broad spectrum drugs should be restricted so that these medications remain effective in serious situations. Previous survey conducted by (Punj *et al.*, 2016; Kaul *et al.*, 2018) reveals that there is a practice of over prescription of antibiotics for routine purposes as the undergraduates mostly have a limited knowledge (Rajendran *et al.*, 2019) this survey is conducted to analyse this specifically asked by a questionnaire. The unnecessary usage of antibiotics should be condemned. It must be only used for specific treatments rather than for routine practices.(Hussainy *et al.*, 2018; Rajendran *et al.*, 2019) The proper usage of antibiotics must be highlighted and should create an awareness and practice among the undergraduates for specific endodontic treatments.(Noor, S Syed Shihaab and Pradeep, 2016). This study was conducted to determine the knowledge, awareness and perception on usage of antibiotics among undergraduate students for endodontic therapy.

## **MATERIALS AND METHODS**

An online survey was done with the structured questionnaire based on knowledge, awareness, practice among undergraduate students doing endodontic treatment and prescribing antibiotics to patients . A snowball sampling was followed for this study. The questionnaires were distributed via electronic media and responses were collected. All the participants were allowed to choose one of the given three to four choices for each item in the questionnaire. It is a self structured questionnaire of minimum 15 questions with a sample size of 320 dental students as participants.The questionnaire consists of questions that help in providing awareness among the students and also helps in easy collection of data and is really cost effective. (Kumar and Delphine Priscilla Antony, 2018). But the disadvantage of online surveys is that there might be repeatable answering and also surgery topics would be mostly opinion based rather than evidence based.

### **Ethical Approval**

Ethical permission and approval for the project was obtained from the Institutional Review Board of Saveetha Institute of Medical and Technical Sciences, Chennai, India Date on: 25/04/2020.

### **Eligibility Criteria**

Dental undergraduate students attending clinics [ third years, final years and interns].

### **Data Collection**

This cross sectional survey was conducted during April to May 2020 including undergraduate dental students. The questionnaire was shared online. Response was obtained from 318 participants. It is a self structured questionnaire of minimum 15 questions.

### **Sample Size**

Total number of questionnaires shared was 320. Out of which 2 were incomplete forms which were excluded from the study .Hence, the total number of participants were 318.

### **STATISTICAL ANALYSIS**

After entries of data in Microsoft Excel, the IBM Statistical Package for the Social Sciences [SPSS] software version 21.0 was used to analyze the data. The descriptive statistics were used to determine the frequencies and percentage of the responses given by the study participants. Correlation analysis was performed to find association between KAP and their use in endodontic procedures and Chisquare test was performed to determine the association between the use of various antibiotics and appropriate prescription of them by the study participants. The results are represented in the form of pie charts.

### **RESULTS AND DISCUSSION**

Among the output data, different parameters were assessed. Among the 318 respondents the questionnaire took data of age, gender, year of study and various antibiotics prescription for endodontics treatment . The results of the survey are presented in the following charts. Majority of respondents were female respondents (51.57% ), followed by male respondents (48.11 %). The respondents were interns (45.6%) and their mean percentage was higher, followed by third years (38.3%) and final years (16.1%). Majority of respondents proved that the interns(16.67%) frequently prescribe antibiotics followed by third years and final years . Majority of the respondents proved that the interns commonly prescribe amoxicillin for endodontic infections (17.58%) followed by third years and final years. Majority of the respondents proved that the commonest route of antibiotics preferred by the interns is intravenous , followed by the third years and final years. Majority of the respondents proved that the use of antibiotics effectively reduces infection (21.21%). Majority of the respondents proved that awareness about local drug delivery is more in interns(18.29%). Majority of the respondents proved that most of the interns (36.67%) prefer the usage of triple antibiotic paste for intracanal medication then the final years and third years. Majority of the respondents proved that the antibiotics mostly used by the interns for acute pulpitis is pulpomixine followed by the third years and final years. Majority of the respondents proved that the interns have more knowledge on the prescription of antibiotics (32.42%) followed by third years and final years. Majority of the respondents proved that the interns (17.47%) properly prescribe antibiotics for endodontic infections than third years and final years. Majority of the respondents proved that majority of the interns prescribe antibiotics for managing pain followed by third years and final years.(13.94%). Majority of the respondents proved that all the participants took medical history of patients before prescribing antibiotics(36.97%). Majority of the respondents proved that interns were aware of the recommended

antibiotic duration protocol(30.01%).Majority of the respondents proved that interns frequently call patients for review visits after endodontic treatments than the third years and final years(28.79%). Majority of the respondents proved that the interns were interested in attending CDE programs more than third years and final years.(24.24%).The study was done with the objectives of assessing knowledge, awareness and practice of dental undergraduate students towards rational use of antibiotics in Endodontic treatment.Antibiotics are widely used in the field of dentistry particularly in endodontic treatments such as the root canal treatment ,etc.The proper prescription of antibiotics to the patients is of utmost important ,as improper prescription of antibiotics may lead to antibiotic resistance. Antibiotic resistance is a phenomenon in which there is a change in response to the use of certain medication.A previous study on usage of intracanal medicaments among general dental practitioners and non endodontic specialists were taken into account.Root canal infection are caused both by aerobic and anaerobic bacteria and so a combination medicament would be required for effective sterilization of the canal.The most commonly used medicament is a combination commercially available as 3-MIX MT. This combination contains metronidazole ciprofloxacin and minocycline. Metronidazole which is a nitroimidazole compound is a drug used for treating anaerobic infection.Minocycline is a bacteriostatic compound which inhibits collagenases matrix metalloproteinases and increases the level of interleukin/10.Ciprofloxazin, which is a synthetic fluoroquinolone has rapid bactericidal action.Anaerobic bacteria are resistant to this drug .Hence, ciprofloxacin and metronidazole are often combined in treating mixed infection.Another study about antibiotic abuse and its connection to obesity is taken here.Bacteria present in the gut such as *Enterococcus faecalis* cause dental problem associated with infections. Due to abuse of broad spectrum antibiotics such as cephalosporin and penicillin, cause major infection due to alteration induced into normal flora.As a result of this there is infection of gut which affects other microbial floras.The other microbial floras are present all over the human body such as skin, oral cavity and sinuses ,oesophagus,gastro intestinal tract, urogenital tract and external ear canal and eye.The primary pathway through which the bacteria achieve it metabolic function is the fermentation of substrate such as dietary carbohydrate and glycans . The end products of fermentation help the bacteria by inhabiting the colon and thus has a direct effect on the gut. In this study it is relevant that knowledge (Ravinthar and Jayalakshmi, 2018)

regarding different aspects of antibiotics is satisfactory but not excellent among dental students. Similar observations were (Ingale and Mahajan, 2018) (Ramesh, Teja and Priya, 2018) done on medical students who have a proper knowledge in prescribing antibiotics for their patients.In this study more than 65.41% answered correctly to the question that whether antibiotics are useful in pulpitis (Scheinfeld, Struach and Ross, 2002) (Janani, Palanivelu and Sandhya, 2020) which collaborates with the finding of some other studies on pharmaceuticals to assess their knowledge on antibiotics. Different stakeholders and health agencies are raising concerns that antibiotic resistance is global public health problem and potential threat to mankind and we need to fight out the menace.(Etana, Iticha and Fufa, 2017) (Teja and Ramesh, 2019) This study reveals that 65% of students have this view which is in accordance to the study of mothanna et al, 2013 among undergraduate medical students. Also self medication (Janani, Palanivelu and Sandhya, 2020; Jose, P. and Subbaiyan, 2020) holds the key to the development of antibiotic resistance (Gowri and Muthiah, 2017). Large number of participants in the study have practiced self medication which is in accordance with the study done by (R *et al.*, 2013). Where most of the para medical students have the practice of self medication.The study shows that the attitude towards the rational use of antibiotics is mixed. Majority of the participants prescribe antibiotics daily as oral administration for the patients undergoing endodontic treatments of percentage nearly 37.11%.There should be a mandatory guidelines (Czaja, 2017; Nasim and Nandakumar, 2018) that for only certain endodontic procedure antibiotic should be administered also before prescription antibiotic history of the patients must be taken to check whether they have encountered any allergy to the drug.

## CONCLUSION

The present study concludes that undergraduate dental students have moderate knowledge and misconception about antibiotics. Practice of medical prescription was found adequate but they were not following specific guidelines. Hence, awareness and thorough knowledge about the prescription of antibiotics regime and its usage should be mandatory to all students before entering clinics.

## Study Limitation and Future Scope

This study included lesser sample size and were very limited drugs. A wider aspect of use of drugs after dental procedures can be taken into consideration. And also more participants can be included to get a broader perspective regarding the usage of antibiotics in endodontic treatment procedures among undergraduate dental students.

## Author Contributions

Writing - Original Draft Preparation; S.R-Review and Editing;

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Nil

## Conflicts of Interest

There are no conflicts of interest.

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| <b>DemoFigureic Variables</b> | <b>Categories</b> | <b>No of Respondents</b> | <b>Percentage</b> |
|-------------------------------|-------------------|--------------------------|-------------------|
| <b>Gender</b>                 | Female            | 165                      | 51.57%            |
|                               | Male              | 153                      | 48.11%            |
| <b>Year of Study</b>          | Third Years       | 121                      | 36.67%            |
|                               | Final Years       | 57                       | 17.27%            |
|                               | Interns           | 152                      | 46.06%            |

**Table 1:** Showing distribution of cases which were included for the study based on Gender and year of study . Maximum number of respondents were Interns .Out of 318 cases, 51.57% were female and 48.11% were male.

| <b>Gender</b> | <b>How often do you write prescriptions for antibiotics for endodontic infections?</b> |               |                |                    | <b>P value</b> |
|---------------|--|---------------|----------------|--------------------|----------------|
|               | <b>Daily</b>   | <b>Weekly</b> | <b>Monthly</b> | <b>Hardly ever</b> |                |
| <b>Male</b>   | 34   | 51            | 55             | 16                 | 0.01           |
| <b>Female</b> | 66   | 63            | 29             | 15                 |                |
| <b>Total</b>  | 100  | 114           | 84             | 31                 |                |

**Table 2 :** Shows the distribution of responses of participants on the frequency of antibiotic prescription for endodontic infections,showing statistically significant difference between the variables.[p< 0.05].

| <b>Gender</b> | <b>What is the most common antibiotic prescribed by you?</b> |                   |                    |                   | <b>P value</b> |
|---------------|--|-------------------|--------------------|-------------------|----------------|
|               | <b>Amoxicillin</b>   | <b>Cephalexin</b> | <b>Clindamycin</b> | <b>Penicillin</b> |                |
| <b>Male</b>   | 44   | 21                | 57                 | 32                | 0.16           |
| <b>Female</b> | 50   | 13                | 41                 | 60                |                |
| <b>Total</b>  | 94   | 34                | 98                 | 92                |                |

**Table 3 :** Shows the distribution of responses of participants on the most commonly prescribed antibiotic by them, showing statistically no significant difference between the variables.There is no significant difference among the groups in Chi square test value is 15.608 and p value is 0.16 [ >0.05].

| Gender | What is the most common route of antibiotic administration? |             |      | P value |
|--------|---|-------------|------|---------|
|        | Intramuscular   | Intravenous | Oral |         |
| Male   | 33  | 74          | 47   | 0.009   |
| Female | 14  | 79          | 71   |         |
| Total  | 47  | 153         | 118  |         |

**Table 4 :** Shows the distribution of responses of participants on the most common route of antibiotic administration, showing statistically significant difference between the variables. There is a significant difference among the groups in Chi square test value is 13.553 and p value is 0.009 [ <0.05].

| Gender | Does the use of antibiotics effectively reduce infection |    |            |     | P value |
|--------|--|----|------------|-----|---------|
|        | Mostly   | No | Not always | Yes |         |
| Male   | 52   | 41 | 20         | 41  | 0.141   |
| Female | 43   | 43 | 13         | 65  |         |
| Total  | 95   | 84 | 33         | 106 |         |

**Table 5:** Shows the distribution of responses of participants on what they think, whether the use of antibiotics effectively reduces infection, showing statistically no significant difference between the variables. There is no significant difference among the groups in Chi square test value is 9.638 and p value is 0.141 [ >0.05].

| Gender | Is local drug delivery possible with antibiotics? |    | P value |
|--------|---|----|---------|
|        | Yes   | No |         |
| Male   | 100   | 54 | 0.138   |
| Female | 122   | 42 |         |

|              |     |    |  |
|--------------|-----|----|--|
| <b>Total</b> | 222 | 96 |  |
|--------------|-----|----|--|

**Table 6 :** Shows the distribution of responses of participants on what they think on the local drug delivery system, showing statistically no significant difference between the variables. There is no significant difference among the groups in Chi square test value is 3.956 and p value is 0.138 [ >0.05].

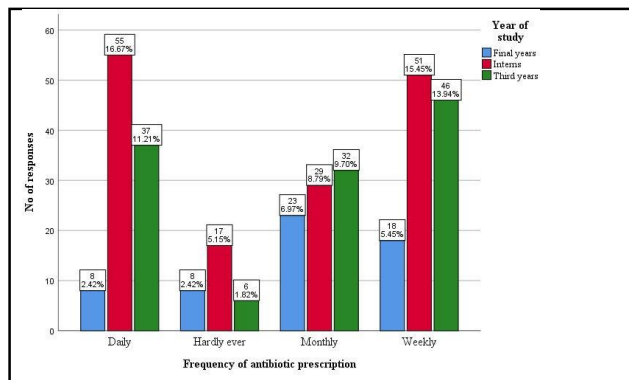
| <b>Gender</b> | <b>Do you use triple antibiotic paste for treating endodontic infections and for what?</b> |                                 |                     | <b>P value</b> |
|---------------|--|---------------------------------|---------------------|----------------|
|               | <b>Intracanal Medication</b>   | <b>Regenerative Endodontics</b> | <b>Both A&amp;B</b> |                |
| <b>Male</b>   | 41   | 78                              | 35                  | 0.001          |
| <b>Female</b> | 78   | 61                              | 25                  |                |
| <b>Total</b>  | 119  | 139                             | 60                  |                |

**Table 7:** Shows the distribution of responses of participants on what they think on the use of triple antibiotic paste for treating endodontic infections, showing statistically significant difference between the variables. [p<0.05] There is a significant difference among the groups in Chi square test value is 18.917 and p value is 0.001 [ <0.05].

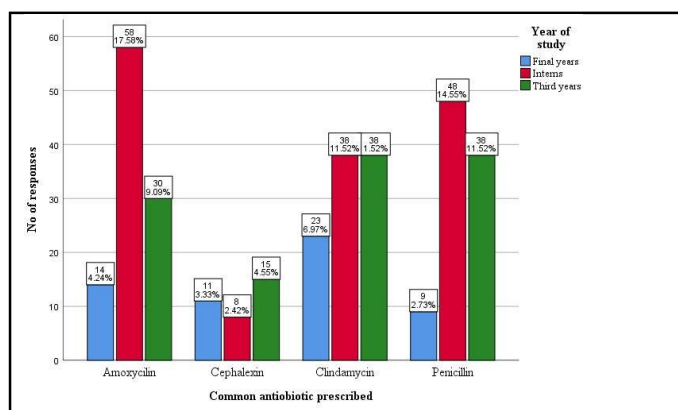
| <b>Gender</b> | <b>What antibiotic you mostly use for acute pulpitis</b> |                    | <b>P value</b> |
|---------------|--|--------------------|----------------|
|               | <b>Amoxicillin</b>                                       | <b>Pulpomixine</b> |                |
| <b>Male</b>   | 65   | 89                 | 0.10           |
| <b>Female</b> | 45   | 119                |                |
| <b>Total</b>  | 110  | 208                |                |

**Table 8:** Shows the distribution of responses of participants on what they think on the antibiotic used for acute pulpitis, showing statistically no significant difference between the variables. There is no significant difference among the groups in Chi square test value is 9.142 and p value is 0.10 [ >0.05].

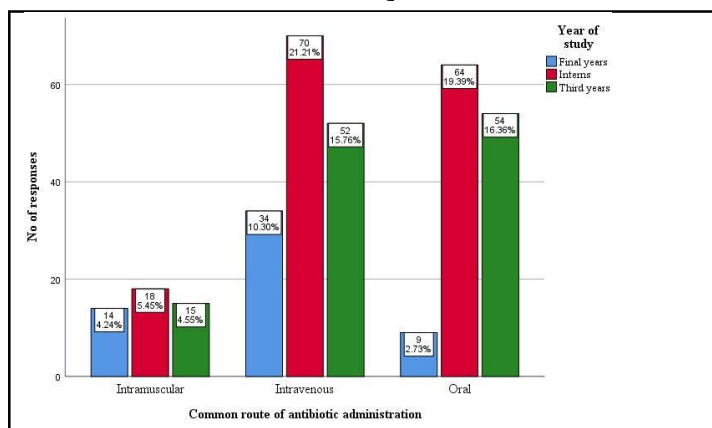
### Graphs



**Figure 1 :** Bar chart represents the association between year of study and frequency of antibiotic prescription . X axis represents the frequency of antibiotics prescription whereas Y axis shows the number of responses in each category. Majority of respondents proved that the interns frequently prescribe antibiotics followed by third years (Green) and final years (Blue). Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 19.115, p value- 0.004 [ $< 0.05$ ].

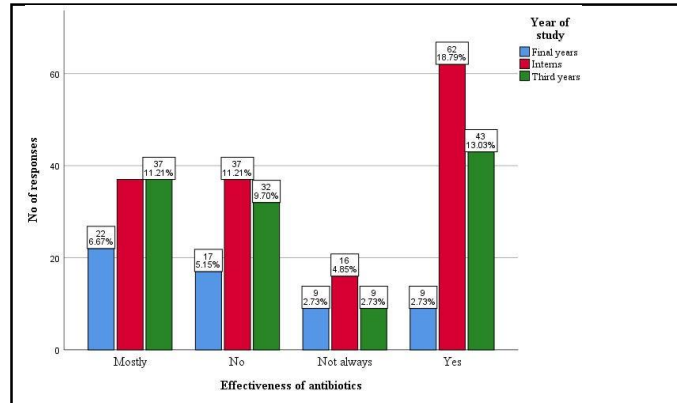


**Figure 2 :** Bar chart represents the association between year of study and the common antibiotic prescribed . X axis represents the commonly prescribed antibiotic whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the interns commonly prescribe amoxicillin for endodontic infections followed by third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 20.956, p value- 0.002 [ $< 0.05$ ].

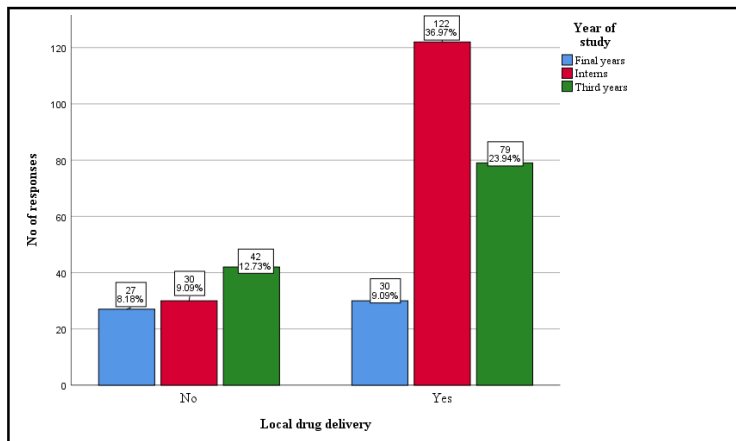


**Figure 3 :** Bar chart represents the association between year of study and common route of antibiotic administration. X axis represents the common route of antibiotic administration whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the commonest route of antibiotics preferred by the interns is intravenous , followed by the third years and final years. Chi square

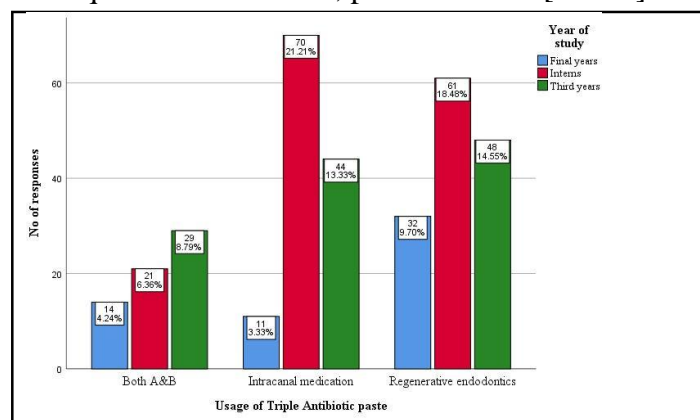
test was done and association was found to be statistically significant. Pearson's Chi square value :16.866, p value-0.002 [ $< 0.05$ ].



**Figure 4 :** Bar chart represents the association between year of study and the effectiveness of antibiotic usage. X axis represents the effectiveness of antibiotics whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the use of antibiotics effectively reduces infection. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value :13.721, p value- 0.033 [ $< 0.05$ ].

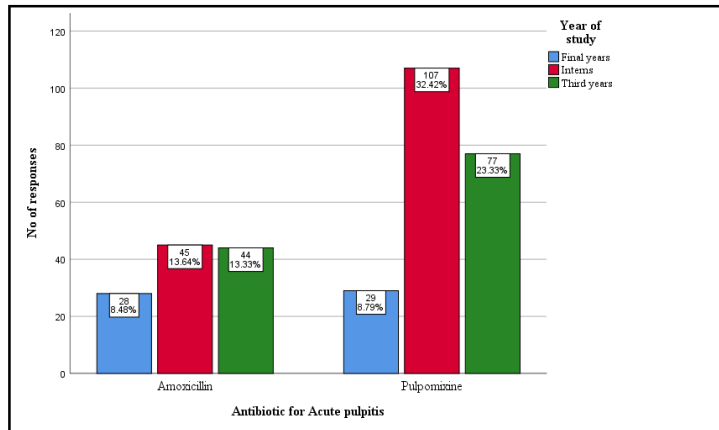


**Figure 5 :** Bar chart represents the association between year of study and local drug delivery. X axis represents the local drug delivery whereas Y axis shows the number of responses in each category. Majority of the respondents proved that awareness about local drug delivery is more in interns. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value :17.091, p value- 0.001 [ $< 0.05$ ].

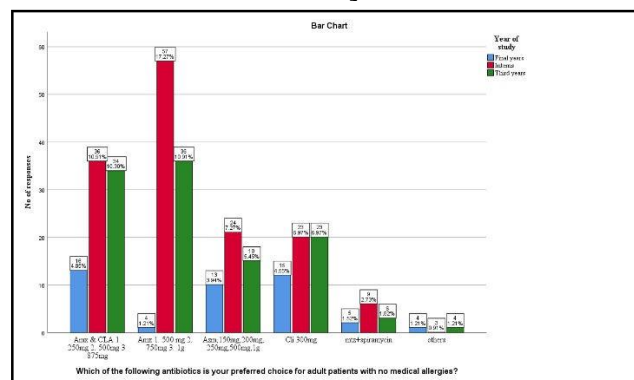


**Figure 6 :** Bar chart represents the association between year of study and the usage of triple antibiotic paste . X axis represents the usage of triple antibiotic paste whereas Y axis shows the number of responses in each category. Majority of the respondents proved that most of the interns prefer the usage of triple antibiotic paste for intracanal medication then the final years and third years. Chi square test was done and

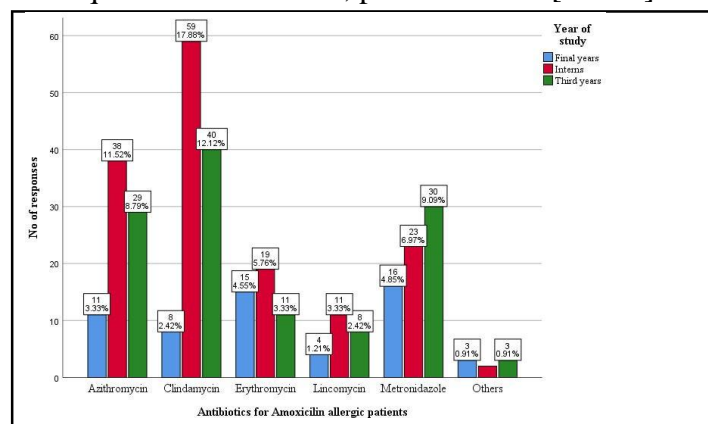
association was found to be statistically significant. Pearson's Chi square value : 15.382, p value-0.004 [ $< 0.05$ ].



**Figure 7 :** Bar chart represents the association between year of study and antibiotic for acute pulpitis . X axis represents the antibiotic used for acute pulpitis whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the antibiotics mostly used by the interns for acute pulpitis is pulpomixine followed by the third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 6.970 , p value- 0.031 [ $< 0.05$ ].

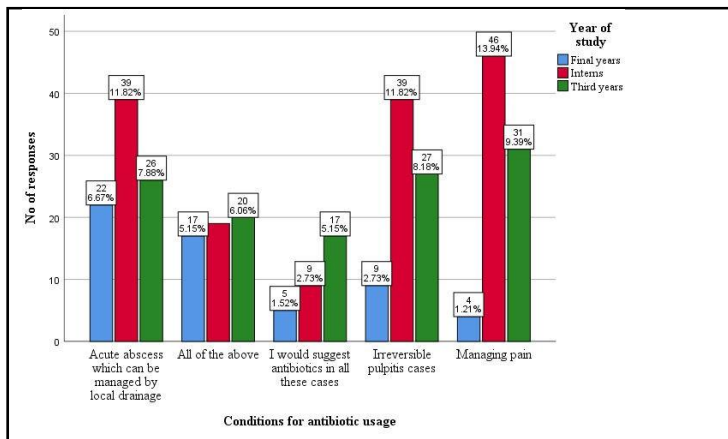


**Figure 8 :** Bar chart represents the association between year of study and choice of different antibiotics for no medical allergies. X axis represents the choice of different antibiotics for no medical allergies whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the interns have more knowledge on the prescription of antibiotics followed by third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 22.252 , p value- 0.014 [ $< 0.05$ ].

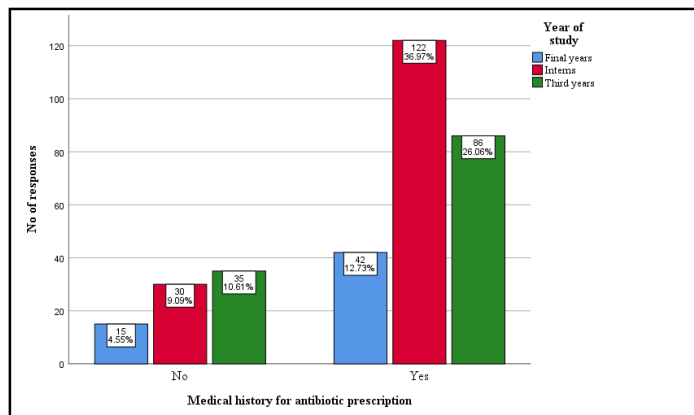


**Figure 9 :** Bar chart represents the association between year of study and antibiotics for amoxicillin allergic patients . X axis represents the antibiotics for amoxicillin allergic patients whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the interns properly prescribe antibiotics for endodontic infections than third years and final years. Chi square test was done

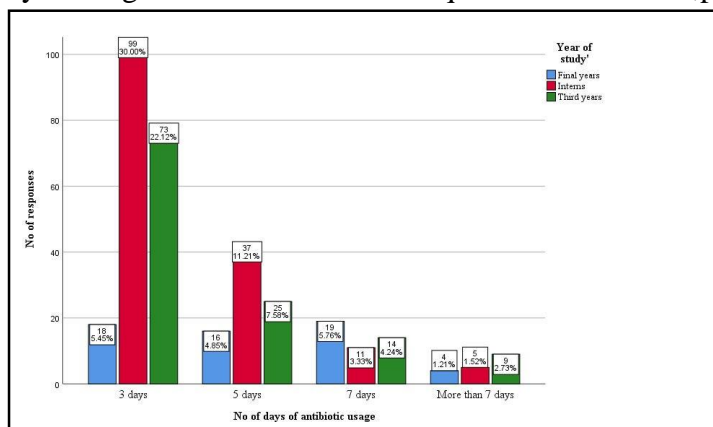
and association was found to be statistically significant. Pearson's Chi square value : 24.554 p value-0.004 [ $< 0.05$ ].



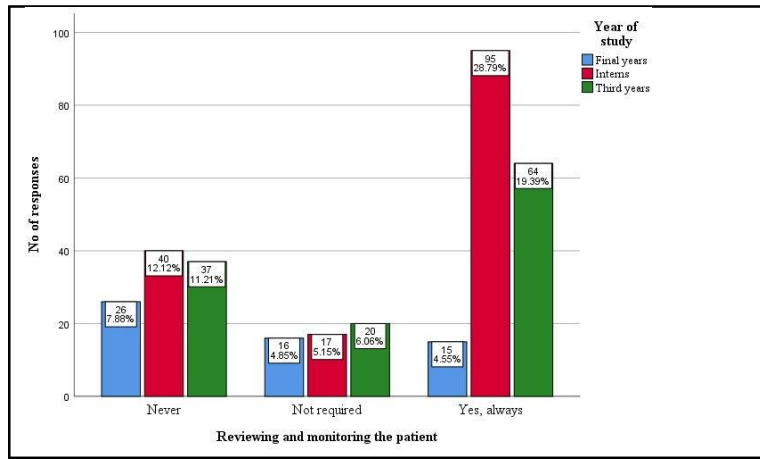
**Figure 10 :** Bar chart represents the association between year of study and conditions for antibiotic usage. X axis represents the conditions for antibiotics usage whereas Y axis shows the number of responses in each category. Majority of the respondents proved that majority of the interns prescribe antibiotics for managing pain followed by third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 27.483, p value-0.001 [ $< 0.05$ ]



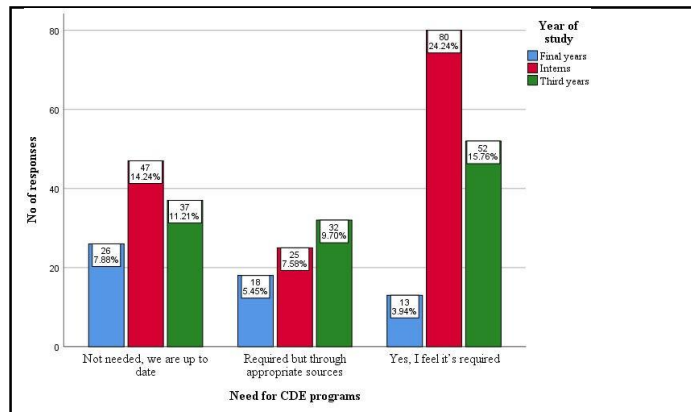
**Figure 11 :** Bar chart represents the association between year of study and medical history for antibiotic prescription . X axis represents the medical history for antibiotic prescription whereas Y axis shows the number of responses in each category. Majority of the respondents proved that all the participants took medical history of patients before prescribing antibiotics. Chi square test was done and association was found to be statistically non significant. Pearson's Chi square value : 3.259 ,p value-0.196 [ $> 0.05$ ].



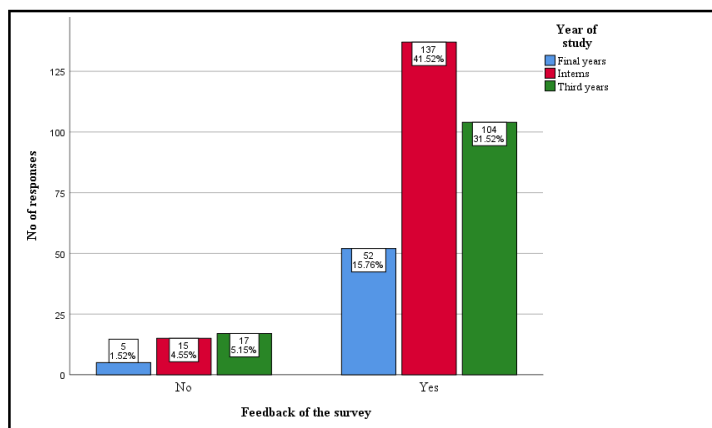
**Figure 12 :** Bar chart represents the association between year of study and number of days of antibiotic usage . X axis represents the number days of antibiotic usage to patients whereas Y axis shows the number of responses in each category. Majority of the respondents proved that interns were aware of the recommended antibiotic duration protocol. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 34.768 ,p value-0.001 [ $< 0.05$ ].



**Figure 13 :** Bar chart represents the association between year of study and reviewing and monitoring the patient . X axis represents the reviewing and monitoring the patient whereas Y axis shows the number of responses in each category. Majority of the respondents proved that interns frequently call patients for review visits after endodontic treatments than the third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 22.652, p value-0.002 [ $< 0.05$ ].



**Figure 14 :** Bar chart represents the association between year of study and the need for CDE programs. X axis represents the need for CDE programs whereas Y axis shows the number of responses in each category. Majority of the respondents proved that the interns were interested in attending CDE programs more than third years and final years. Chi square test was done and association was found to be statistically significant. Pearson's Chi square value : 16.891, p value- 0.002 [ $< 0.05$ ].



**Figure 15 :** Bar chart represents the association between year of study and feedback of survey . X axis represents the feedback of the survey whereas Y axis shows the number of responses in each category. The majority of the respondents felt the survey was useful for them. Chi square test was done and association was found to be statistically non significant. Pearson's Chi square value 1.595, p value- 0.450.



