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RESEARCH ARTICLE

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Knowledge, Attitude and Perspective on Management of Medical Emergencies Among Undergraduate Dental Students

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ABSTRACT

Any dental professional can encounter an emergency during the course of their treatment. Every dental specialist should have the knowledge to identify and manage a potentially life threatening situation. Dental professionals are expected to provide safe and painless dental procedures when they complete their education from dental college. The aim of the study was to observe the knowledge, attitude, and perspective on the management of medical emergencies among undergraduate dental students. This survey was taken in an online forum, survey planet. The questionnaire regarding the knowledge of dental students about medical emergencies was distributed. The results were statistically analyzed and presented using SPSS software. Hundred (100) students participated in this survey out of which 82% of the dental students confessed that before commencing any treatment they note the medical history and drug allergy history of patients. Around 66% of the dental students confessed that they check the vital signs of patients before the commencement of treatments, dental procedures in dental college follow up these protocols for patients only with any systemic disease and it is seen that it was not a part of many of dental colleges routine checkup. The majority of the participants (79%) confessed that they were aware of how to manage chest pain and anaphylaxis. 90% of the dental students have answered that they were aware of the medical emergency drugs used in dental clinics. A better knowledge of medical emergencies will ensure safer dental healthcare services for the population. The study showed deficiencies in the way that dentists are trained to deal with medical emergencies and identified a need for improvement.

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INTRODUCTION

Professional bodies usually have their own code of conduct for their members. The ethics for dentists in regards to patients was levelled up by the dental council of India. Treat the welfare of the patients as paramount to all the other considerations and shall conserve it to the utmost of his ability. The extent of treatment by the dentist requires preparation, prevention, and then management, as necessary [1]. Prevention is accomplished by conducting a thorough medical history before dental treatments, so as to avoid medical emergencies. Dental professionals are always expected to provide safe and painless dental procedures when they complete their education from dental college [2]. Undergraduate dental education's aim has been described as, to produce a caring, knowledgeable, competent and skillful dentist who is able to graduate and accept professional responsibility for the effective and safe care of patients who appreciate the need for continuing professional development. Medical emergencies are 5 - 8 times more likely to occur in dental offices than in medical offices [3]. Stressful environments that the patient has to go through, may be considered as the cause. It is ultimately the dentist's responsibility for providing effective management of an emergency situation in the dental office. Lack of training and an inability to cope with medical emergencies will cause tragic complications and severe consequences [4].

A medical condition demanding immediate treatment is an emergency. In the dental offices, medical emergencies do occur [5]. It is mandatory that every dental health professional should have the basic knowledge to manage potentially life threatening situations. The lack of training and inability to cope with medical emergencies can cause tragic consequences and sometimes legation action. Hence all healthcare professionals, dental care professionals must be well prepared to manage medical emergencies.

Ensuring that oxygenated blood is being delivered to these critical organs is one of the main management of medical emergencies. Dentists must be competent with basic cardiopulmonary resuscitation. The skills to manage most medical emergencies will begin with the assessment which follows the necessary treatment of airway, breathing, and circulation (the ABCs of CPR) accordingly. Usually, only after these ABCs are addressed should the dentist consider the use of emergency drugs [6].

Clinical learning in dentistry for an undergraduate is one of the most important phases of the learning process. More than being theoretically taught, additional practical training to handle the medical emergency situation in dental clinics will enable the student to gain confidence in them. Managing emergency situations will improve and increase the confidence level among new graduates [5].

Most of the circumstances in the dental office will provoke medical emergencies. Frequent causes of emergency situations such as syncope, hyperventilation, and cardiac arrest are some of the fear of surgical operations in many patients. Most of the dentists getting a detailed medical history of the patient are helpful in preventing or minimizing medical emergencies in the dental office. This information is useful during the patient examination. It is reported that three-quarters of all medical emergencies develop because dentists often fail to recognize a patient's anxiety. Previously our team had conducted numerous clinical trials and in vitro studies[7–26] over the past 5 years. Now we are focusing on the epidemiological surveys. The idea for this survey regarding medical emergencies among dental students stemmed from the current interest in our community.

Hence, the aim of the study was to observe the knowledge, attitude, and perspective on the management of medical emergencies among undergraduate dental students.

MATERIALS AND METHODS

This was a survey-based study and conducted in an online forum, survey planet. This survey was taken by hundred (100) dental graduates from private dental college. The questionnaire consisted of 13 questions. The questions were framed to evaluate the knowledge, attitude, and awareness on practical management of medical emergencies in dental clinics.

Data Collection

The collected answers from the questionnaire were tabulated in an excel sheet and using SPSS software the results were obtained.

Sampling

100 dental students who work in clinics regularlyA customized examination was used to collect data and a specific table for collected data records was prepared.

Ethical approval

The study protocol was approved by the institutional review board and ethical approval was obtained.

All data were analyzed by multiple logistics regression analysis using SPSS software version, inference of the study is given below.

FINDINGS AND DISCUSSION

Based on the tabulated results it was seen that the level of knowledge of dental students in managing

medical emergencies was good. Around 100 dental students participated in this survey, out of which the majority of the dental students participated are from the third year (Figure 1). The majority of the students (74%) enquire about medical history including medication and allergy before the commencement of the treatment (Figure 2). 62% of the students before commencement of the treatment obtained vital signs of patients (Figure 3) and around 71% of the dental students were aware of how to give CPR for emergencies (Figure 4). The majority of the participants (76%) confessed that they were aware of how to manage chest pain (Figure 5) and anaphylaxis (Figure 6). 90% of the dental students have answered that they were aware of the medical emergency drugs used in dental clinics (Figure 7). Around 46% of dental students answered that the position for syncope is supine position with legs elevated while 35% confessed upright and 19% supine (Figure 8). The majority of dental students (66%) were aware that the first line of drugs for anaphylaxis is Adrenaline (Figure 9). 68% of the dental students said that they knew how to give the intramuscular injection (Figure 10) and around 57% of the dental students said that they knew how to give the intravenous injection (Figure 11). Around 83% of the participants are positive in handling any medical emergencies in the clinic while the rest 17% of the participants have a lack of confidence in treating patients with medical emergencies (Figure 12). Correlation between the year of study and awareness among dental students about enquiring about the prolonged history of medication before the commencement of treatment was done and the P-value was found to be 0.784 > 0.05, which was not significant (Figure 13). Correlation between the year of study and knowing the students' knowledge regarding how to manage chest pain was done and the P-value was found to be 0.434 > 0.05, which was not significant (Figure 14). Correlation between the year of study and knowing the students' knowledge regarding how to manage anaphylaxis was done and the P-value was found to be 0.220 > 0.05, which was not significant (Figure 15). Correlation between the year of study and knowing the student's knowledge and awareness regarding the position of patients suffering from syncope was done and P-value was found to be 0.661 > 0.05, which is not significant (Figure 16). Correlation between the association between the year of study and knowing the student's knowledge and awareness regarding how to give the intravenous injection and P-value was found to be 0.007 < 0.05, which is significant (Figure 17).

Dentists are prone to face unpredictable medical emergency crises in their patients during dental practice. These seldom but usually occurring events require a diagnosis for safe and effective management [27]. Therefore, dental care professionals are required to be equipped with information and training on how to manage medical emergencies (MEs) including drug administration.

From the current study, it was seen that the majority of dental students are confident enough in handling medical emergency situations. Out of 100% of the participants, it was noted that 74% of the dental students enquired about the patient's medical history and allergy history before the commencement of any treatment, which correlated with the study done by sopkai et al.[1].

Allergies in dental clinics can be managed by giving the administration of a histamine blocker, such as diphenhydramine, via intramuscular or intravenous injection. The adult patient should be administered 50 mg, and the child patient should receive 25 mg. Oxygen is never wrong but often is not required in such cases. Oral administration of diphenhydramine may have too long an onset of action to be of any practical use during this type of medical emergency so parenteral administration of the diphenhydramine is preferred.

Around 62% of the dental students confessed that they check the vital signs of patients before the commencement of treatments, which contradicts with the study done by Sopkai et al., [1] dental procedures in dental college follow up these protocols for patients only with any systemic disease and it is seen that it is not a part of many of dental colleges routine checkup [28].

From the current survey, it was noted that around 71% of dental students have skills of giving CPR in an emergency situation, which correlates with the study done by Aveek Mukerji et al., [29], with a percentage of around 74%. Cardiopulmonary resuscitation (CPR) requires an immediate start of manual chest compression and defibrillation as soon as possible. During dental surgery, CPR could be started in the dental chair considering the difficulty to move the patient from the dental caries chair to the floor. CPR in dental clinics can be managed by making the patients lie in a supine position. Then following it, the steps Airway - Breathing - Circulation [30] need to be considered.

According to the current study it was noted that around 76% of the dental students displayed good knowledge regarding the management of chest pain in dental clinics, which correlated with the study done by Aveek Mukerji et al [29]. The patient's history is the key determinant to identify the cause of chest pain. Angina pectoris and acute myocardial infarction were the most common cardiac causes for chest pain that patients may experience in dental settings. Chest pain can be managed by comforting the patient and may reduce stress-induced increases in heart rate and

blood pressure. If pain persists, a single tablet of nitroglycerin (0.4 mg tablet) should be administered sublingually. Nitroglycerin dilates systemic veins and reduces venous return, ie, preload [31].

Most of the participants from this survey displayed good knowledge regarding the management of anaphylaxis. They were aware that Adrenaline is the first line of drug in case of anaphylaxis. Anaphylaxis cases are mild but any anaphylaxis case has the potential to become life threatening. Anaphylaxis can be managed firstly by positioning the patient and the following Airway - Breathing - Circulation - Definitive Treatment. Resuscitative drugs such as antihistamine, adrenaline, and corticosteroids should be kept along the side of the dental chair for emergency treatment [32].

From the survey, it was seen that around 90% of the dental students were aware of the medical emergency drugs which showed that theoretical knowledge among dental students was more to be appreciated. This study didn't correlate with the study done by Carvalho et al., [33]. The basic emergency drugs to be remembered by the dental students and kept in clinics are, Glyceryl trinitrate spray, Salbutamol aerosol spray, Adrenaline injection, Aspirin dispersible, Glucagon injection, Oral glucose solution, Midazolam oxygen. From this survey, it was noted that around 46% of the dental students answered that the position for the patients suffering from syncope was a prone position while around 35% of the participants confessed that it was an upright position.

When the question regarding the first line of drug in case of anaphylaxis was asked around, 66% of the students answered correctly that the drug of choice is Adrenaline, which positively correlates with the study done by Aveek Mukerji et al.,[29]. Epinephrine, the single most important drug when an anaphylactic reaction occurs, should ideally be available in a preloaded syringe.

From this survey, it was noted that the majority of the students were good enough in giving an intramuscular and intravenous injection to patients, which positively correlates for intramuscular injection with the study done by Ali et al. Most of the dental surgeons do not feel confident in realizing an urgent intravenous injection. Indeed this phrase needs an intensive phase of learning and regular practice to be performed in safety and effectively [34].

From the current study, it was noted that around 83% of the participants are positive in handling any medical emergencies in the clinic while the rest 20% of the participants have a lack of confidence in treating patients with medical emergencies [35].

Management of medical emergencies should be an integral part of the dental curriculum. Realistic simulation training should be provided in the management of medical emergencies at the undergraduate, postgraduate, and continuing education levels. In addition, medical emergency management training in teaching institutions should be standardized. There should be regularly updating and at least on an annual basis through continuing dental education programs.

CONCLUSION

Within the limitations of the study, the present study showed a much positive response from the majority of dental students indicating that they had good knowledge on managing medical emergencies on a dental chair . Yet, a better practice on handling the medical emergencies will ensure safer dental healthcare services for the population. Training and skills improvement through various training programs on medical emergencies will improve the quality of dental practice and it is beneficial to the patients. Effective management of an emergency situation in the dental office is ultimately the dentist's responsibility. Hence, more skills improvement among dental students will ensure better service to the patients.

AUTHOR CONTRIBUTION

The first author (Tasleem Abitha S) performed the analysis and interpretation and wrote the manuscript. The second author (Dr. Deepika Rajendran) contributed to the conception, data design, analysis, interpretation, and critically revised the manuscript. The third author (Dr. Geo Mani) participated in the study and revised the manuscript. All three authors have discussed the results and contributed to the final manuscript.

CONFLICT OF INTEREST

There is no conflict of interest

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Self.

ETHICAL CLEARANCE

It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number-SDC/SIHEC/2020/DIASDATA/0619-0320)

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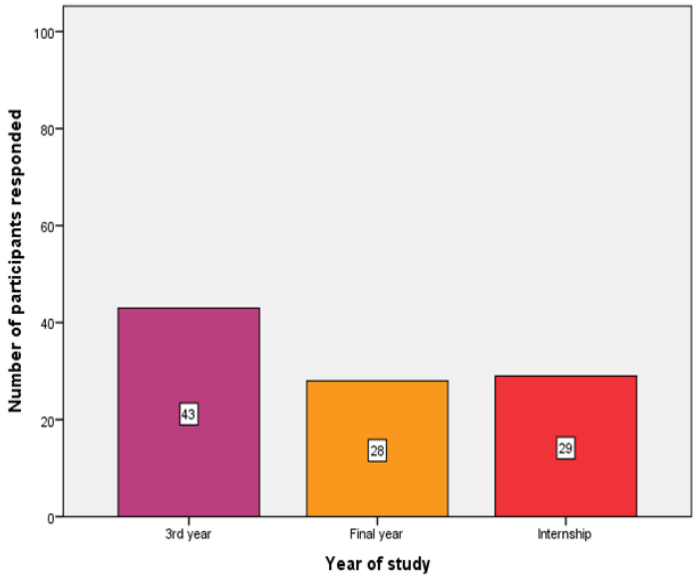

Figure 1:The bar graph depicts the responses to the given question "Year of study". X axis represents the type of response to the question and Y axis represents the number of participants who told 3rd year (Purple), Final year (Orange) and Internship (Red). Majority of the third year study students have participated in this survey (43%).

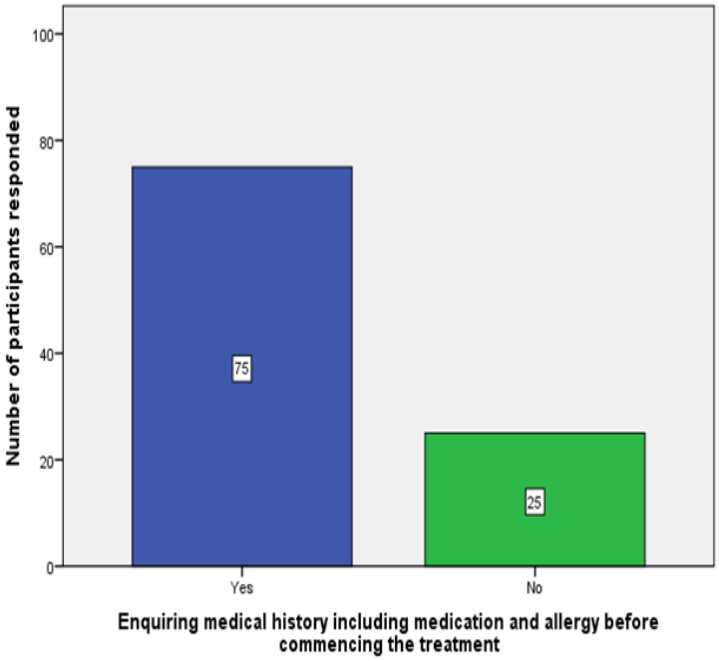

Figure 2 - The bar graph depicts the responses to the given question "Do you enquire about medical history including medication and allergy before commencing the treatment ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the participants do enquire about the history of medication before treatment (74%).

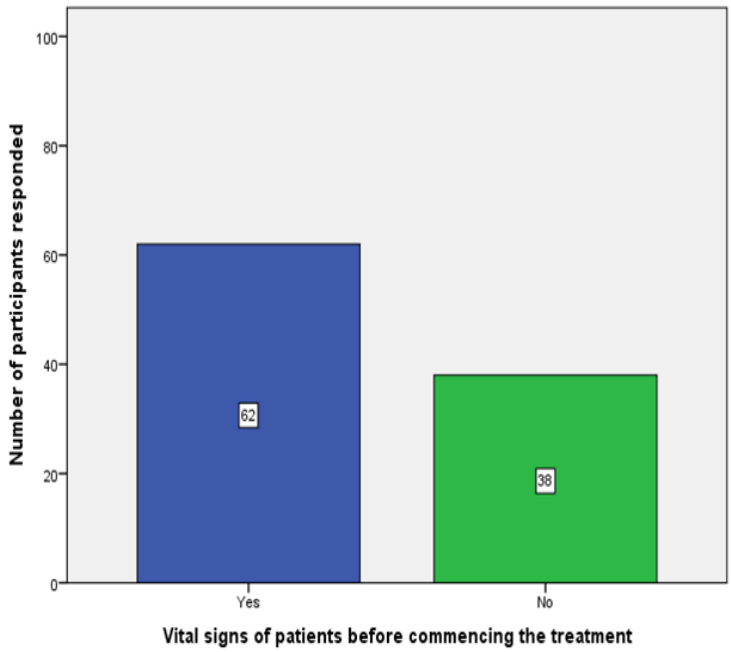

Figure 3 - The bar graph depicts the responses to the given question "Do you obtain the vital signs of patients before commencing the treatment ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the participants do obtain the vital signs of patients before commencing the treatment (62%).

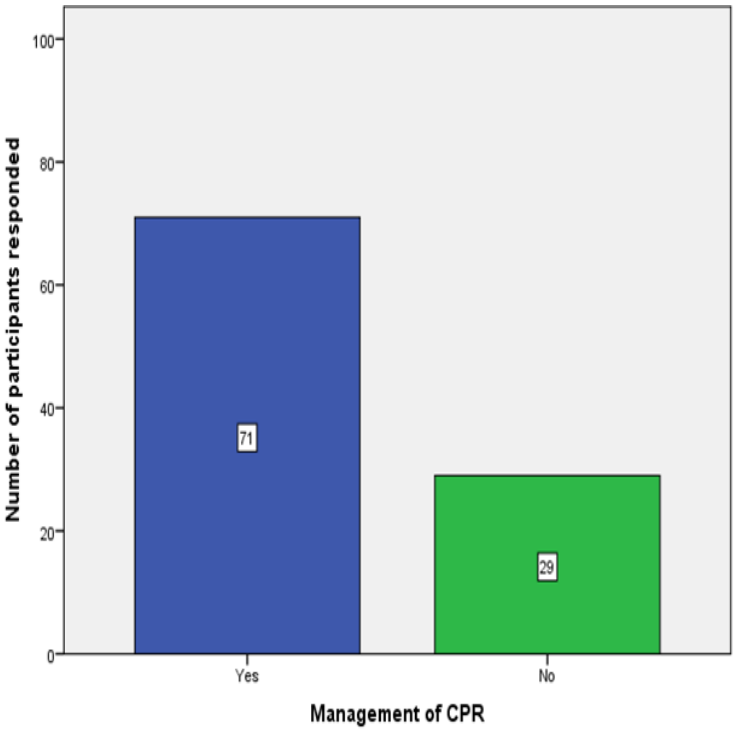

Figure 4 :The bar graph depicts the responses to the given question "Do you know how to give CPR ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware of how to give CPR (71%).

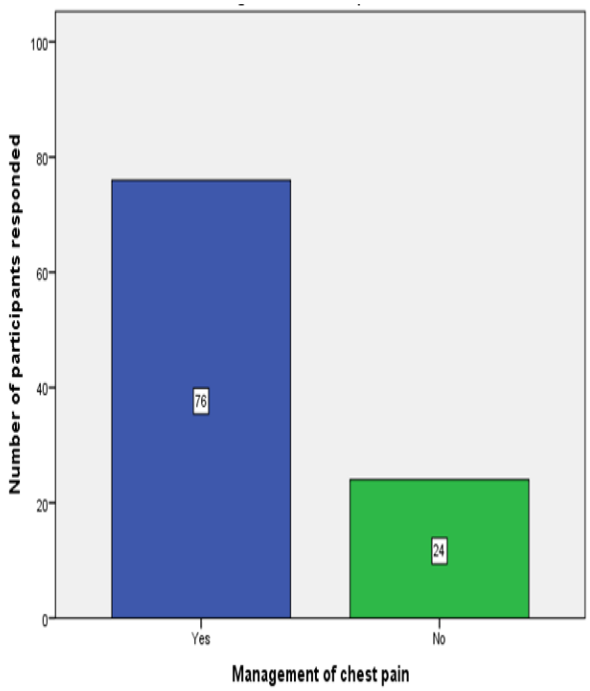

Figure 5: The bar graph depicts the responses to the given question "Do you know how to manage chest pain ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware of how to manage chest pain (76%).

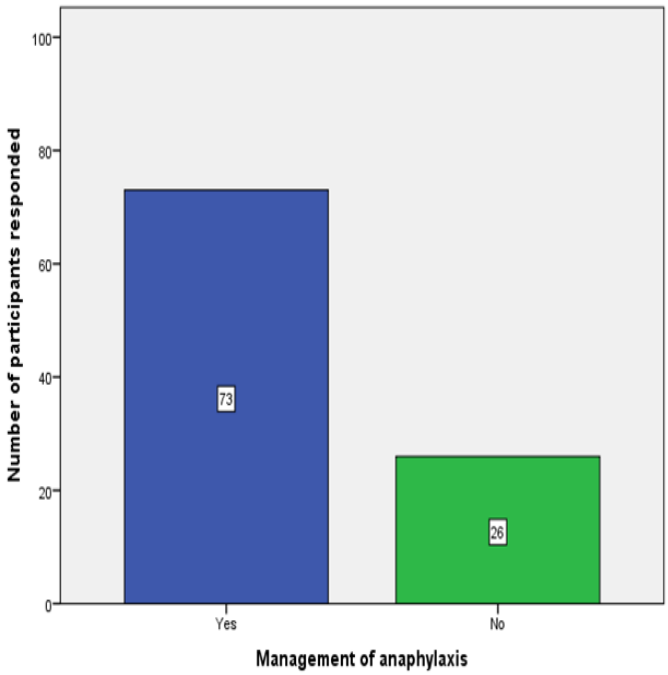

Figure 6: The bar graph depicts the responses to the given question "Do you know how to manage anaphylaxis ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware of how to manage anaphylaxis (73%).

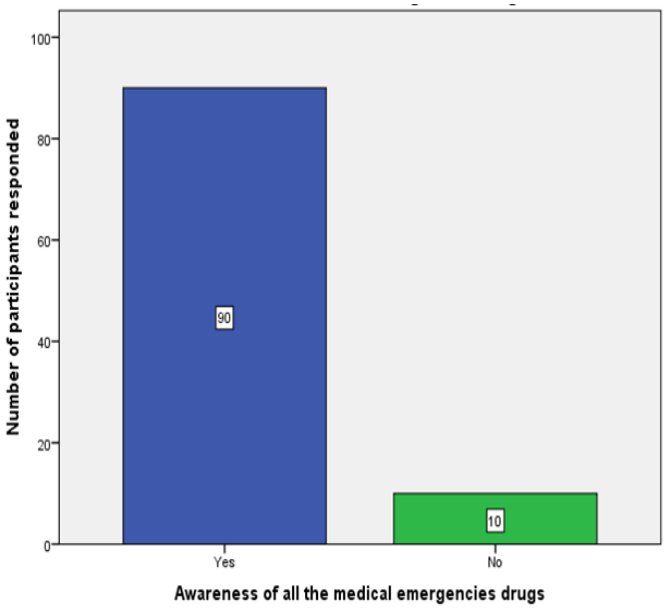

Figure 7: The bar graph depicts the responses to the given question "Are you aware of all medical emergency drugs ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware of all the medical emergency drugs (90%).

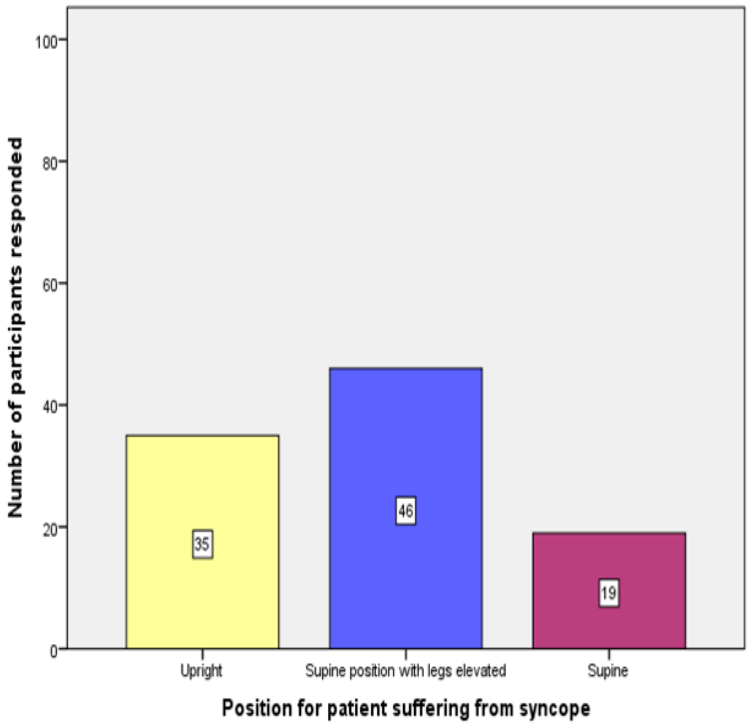

Figure 8: The bar graph depicts the responses to the given question "What is the position for a patient suffering from syncope ?". X axis represents the type of response to the question and Y axis represents the number of participants who told upright (Yellow), supine position with legs elevated (Blue) and supine (Purple). Majority of the dental students were aware that the position for syncope was supine position with legs elevated (46%).

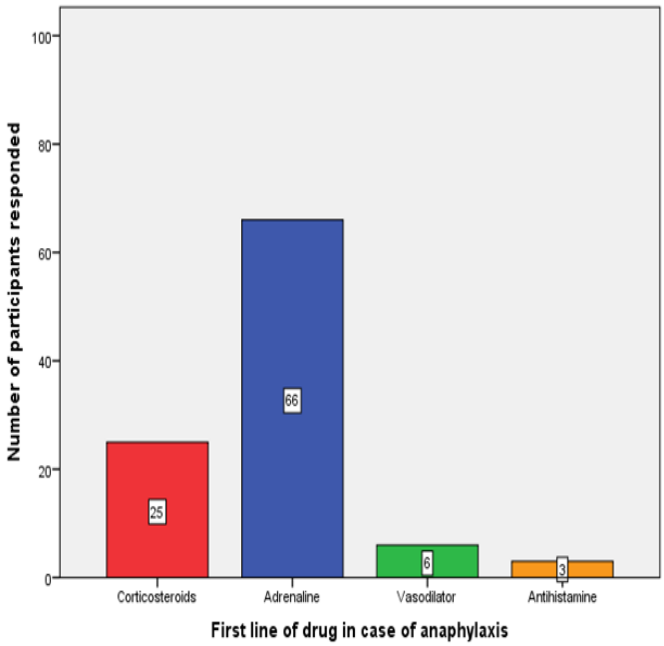

Figure 9 :The bar graph depicts the responses to the given question "What is the first line of drug in case of anaphylaxis ?". X axis represents the type of response to the question and Y axis represents the number of participants who told corticosteroids (Red), adrenaline (Blue), vasodilator (Green) and antihistamine (Orange). Majority of the dental students were aware that the first line of drug for anaphylaxis was Adrenaline (66%).

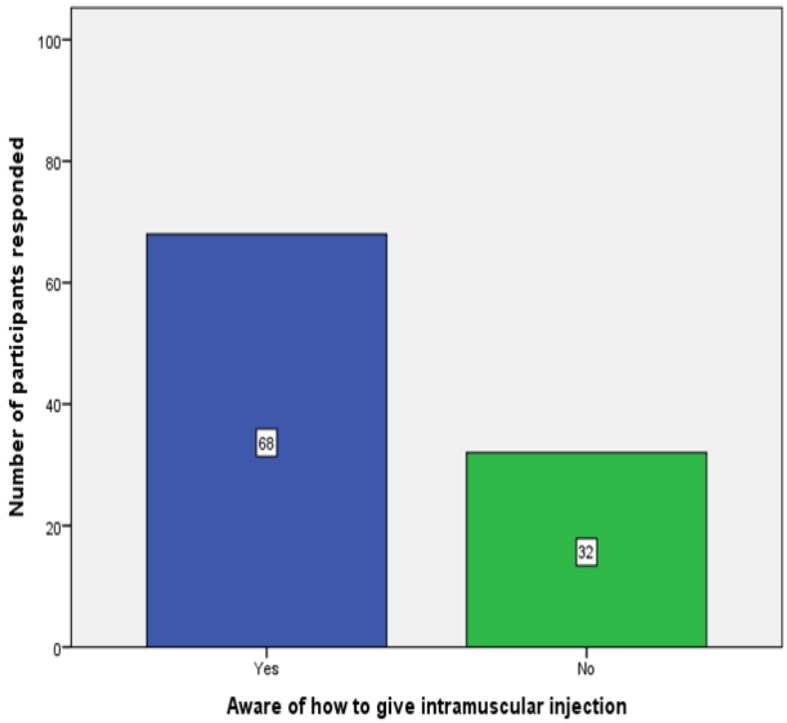

Figure 10 :The bar graph depicts the responses to the given question "Do you know how to give an intramuscular injection ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware how to give an intramuscular injection (68%).

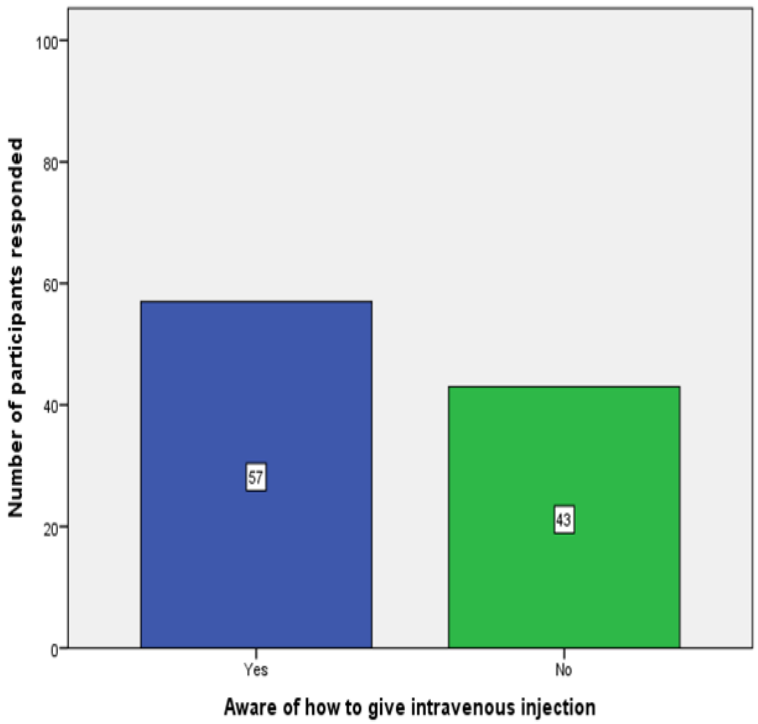

Figure 11 : The bar graph depicts the responses to the given question "Do you know how to give an intravenous injection ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware how to give an intravenous injection (57%).

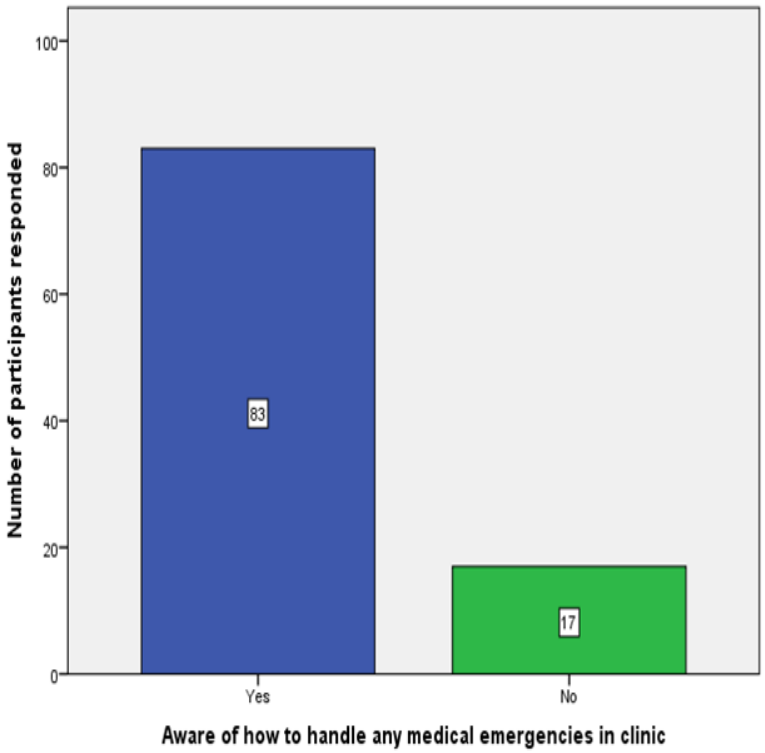

Figure 12: The bar graph depicts the responses to the given question "Do you think you can handle any medical emergencies in a clinic ?". X axis represents the type of response to the question and Y axis represents the number of participants who told Yes (Blue) and No (Green). Majority of the dental students were aware how to handle medical emergencies in clinics (83%).

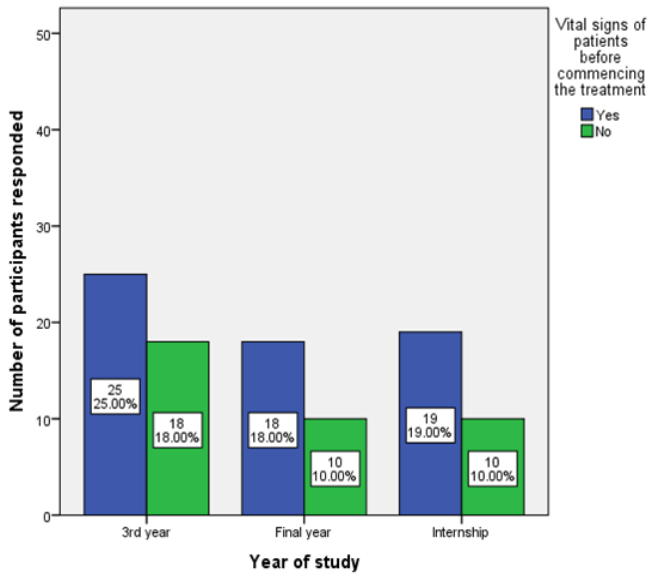

Figure 13: The bar graph represents the association between the year of study and their responses to the given question. X axis represents the year of study of the participants with their responses and Y axis represents the number of responses, Yes (Blue) and No (Green). Majority of third years (25%), final years (18%) and interns (19%) have answered that they obtain vital signs of patients before commencing the treatment. Chi square analysis was done (P value was found to be 0.784 > 0.05, which is not significant). There was no significant difference between the year of study and the response to the question asked.

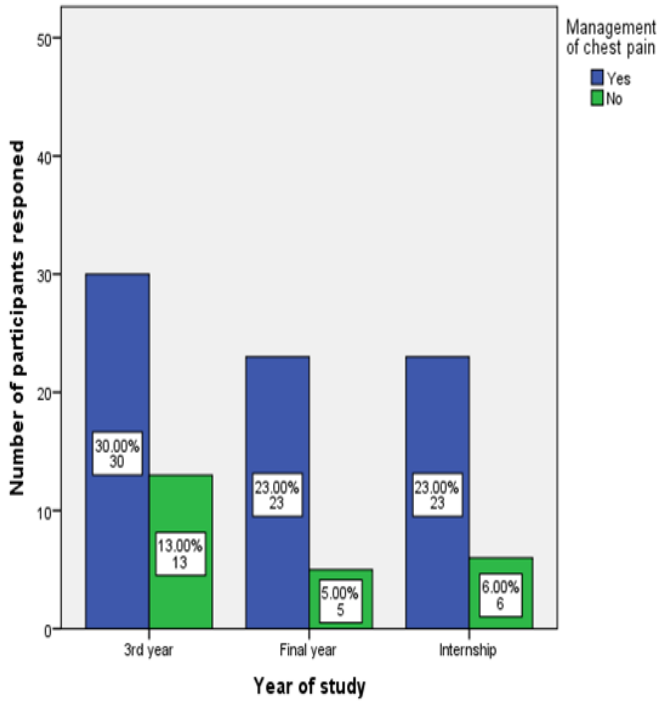

Figure 14: The bar graph represents the association between the year of study and their responses to the given question. X axis represents the year of study of the participants and Y axis represents the number of responses, Yes (Blue) and No (Green). Higher number of third years (30%), final year (23%) and interns (23%) have answered that they are aware of how to manage chest pain in dental clinics. Chi square analysis was done (P value was found to be 0.434 > 0.05, which is not significant). There was no significant difference between the year of study and the response to the question asked.

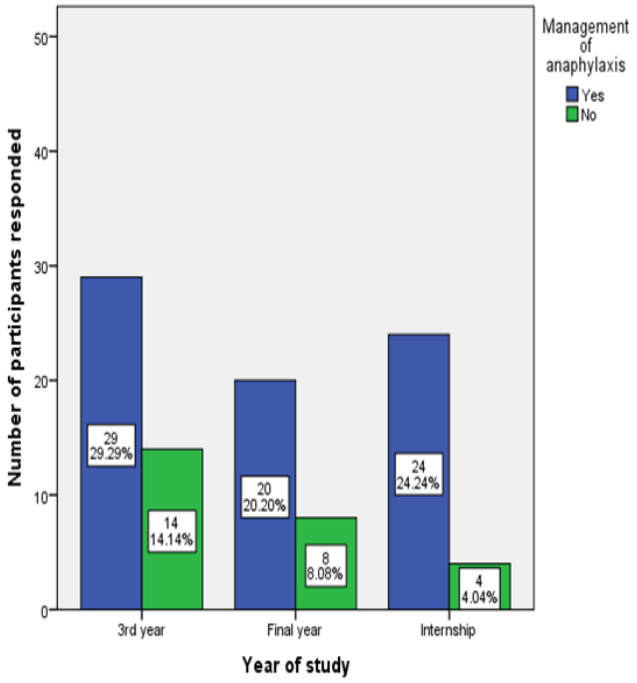

Figure 15: The bar graph represents the association between the year of study and their responses to the given question. X axis represents the year of study of the participants and Y axis represents the number of responses, Yes (Blue) and No (Green). Higher number of third years (29%), final years (20%) and interns (24%) have answered that they are aware of how to manage anaphylaxis. Chi square analysis was done (P value was found to be 0.220 > 0.05, which is not significant). There was no significant differences between the year of study and the response to the question asked.

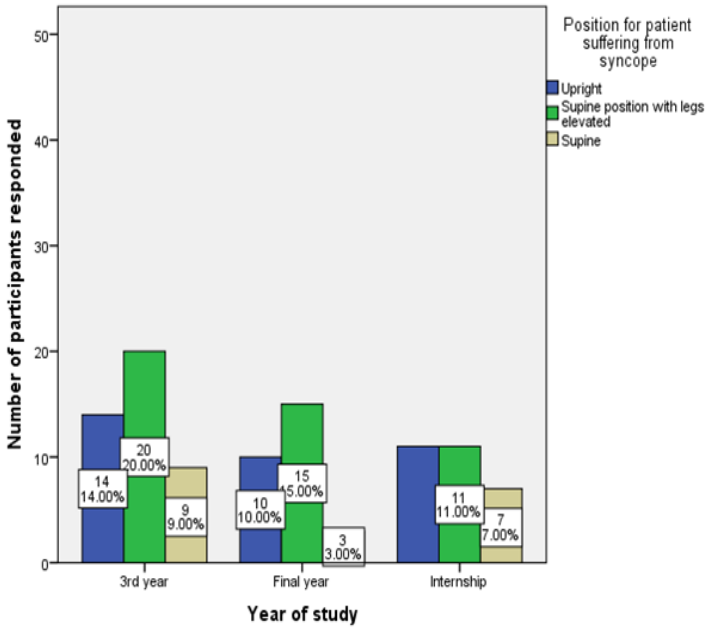

Figure 16 : The bar graph represents the association between the year of study and their responses to the given question. X axis represents the year of study of the participants and Y axis represents the number of responses, Upright (Blue) Supine position with legs elevated (Green) and Supine (Yellow). Higher number (20%) of third years, 15% of final years and 11% interns have answered that the supine position with legs elevated is the position of syncope. Chi square analysis was done (P value was found to be 0.661 > 0.05, which is not significant). There was no significant difference between the year of study and the response to the question asked.

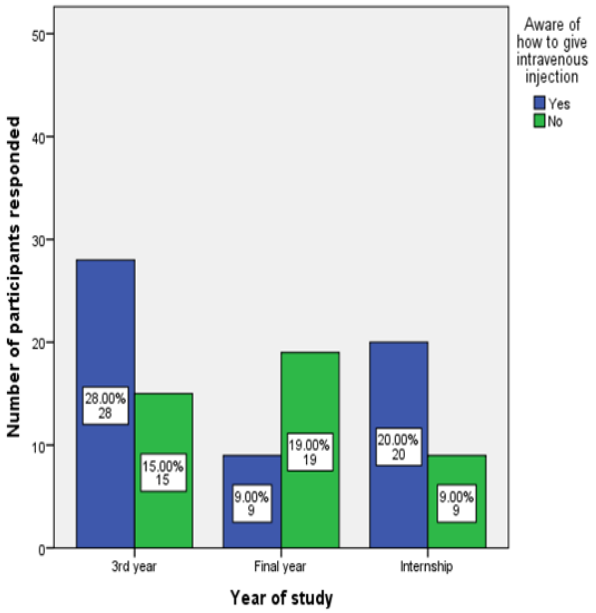

Figure 17: The bar graph represents the association between the year of study and their responses to the given question. X axis represents the year of study of the participants and Y axis represents the number of responses, Yes (Blue) and No (Green). Higher number of third years (28%) have answered how to give an intravenous injection. Chi square analysis was done (P value was found to be 0.007 < 0.05, which is significant). There was significant differences between the year of study and the response to the question asked.