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ADEPTNESS OF PEDODONTISTS IN MANAGING DENTAL CLINIC MEDICAL EMERGENCIES – A CROSS-SECTIONAL SURVEY

Dental Science

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ABSTRACT

INTRODUCTION: Dental treatment can be stress inducing situations for many patients due to anxiety or dental phobia. In such cases medical emergencies can likely be encountered in dental settings by practitioners. If such emergencies ensue, it falls upon the dental practitioner to identify and manage the situation providing obligate care to the patient. Lack of awareness, knowledge and training to deal with such circumstances can lead to serious unanticipated complications and possible medicolegal actions.
AIM: To assess the attitude, adeptness and awareness in managing medical emergencies among Pediatric dentists and Post Graduates of Gujarat.
METHOD: This was a cross-sectional study wherein a self-constructed online survey questionnaire of 17 closed ended questions was designed and validated. The questionnaire was mailed to 150 people which included Post Graduates and Pediatric Dentists of Gujarat out of which a total of 104 responses were accounted. Descriptive statistics were performed using SPSS 20.0 version.
RESULT: Around 84.7 % of the responders had encountered medical emergency in their practice out of which syncope and epileptic seizures were more commonly experienced. Out of all the responders only 15.7 % were confident enough to administer emergency drug via IV or IM if required.
CONCLUSION: There is good amount of knowledge and awareness found amongst the Pediatric dentists and Post graduate students. However, they lack the skills required to manage the emergency situations if encountered. Therefore, to increase the efficiency of the immediate care, training programmes like Basic Cardiopulmonary life support and Simulation Lab. courses should be mandatory in the curriculum.

KEYWORDS

Medical Emergencies, Pediatric Patients, BLS, Dental clinic

INTRODUCTION

An unexpected onset of severe health complications which may threaten a person's life can be termed as a Medical Emergency.[1] Medical emergencies in dental practice are sparse but definitely not uncommon. In fact, their occurrence probability is 5.8 times higher during a dental appointment rather than in medical settings. Though most of the emergency situations may not be life threatening per se but they may lead to potentially serious consequences.[2]

When such medical emergencies arise in / during dental setting, it inadvertently becomes the responsibility of the Dentist to manage the situation without avoiding or referring the patient because it may put the life and health of the patient at risk.[3],[4] Therefore, the dentist at all times should be well prepared to handle any crisis and failing to do so might be catastrophic to the patient as well as practitioner leading to possible legal actions in future. Anders et al in his study mentioned that 50 % of the patients who get treated in a dental school come with atleast one systemic condition which may predispose to complicate the treatment and increase the chances of medical emergencies in dental care.[5]

Most of the guidelines and recommendations for managing any medical emergency in dental setting are designed in focussing the physical characteristics of an adult patient (age, weight etc) but the same recommendations for pediatric patient are not clearly defined and available. [6] Thus for a child patient at concern, the techniques for supportive therapy and the dosages of emergency drugs should be altered and tailored according to his age and physical development.

For a Pedodontist, it gets necessary to provide immediate therapy to the patient without creating undue panic and stress for the child as well as the auxiliary staff. Proper and timely treatment in pediatric patients significantly increases their survival rates without any detrimental effect on neurological functions thereby increasing their chances of recovery.

Thus, in order to handle such crisis, it becomes pertinent for the dental health professional to have basic knowledge about the situation and protocol to manage the same. Gupta et al (2008) in his study stated that approximately only 42 % students during their dental education received professional training to manage emergencies in their practice.[7]

No two children are alike and hence the technique to guide their behaviour and managing them also differs for pediatric patients. It is also well proven that phobia for dental treatment and anxiety are the two distinct risk factors for incidence of medical emergencies in children younger than 12 years of age.[8] Thus it gets imperative for a pedodontist to identify the alarming signs of distress in children undergoing treatment and to intervene timely avoiding any long- term damage due to such events. Therefore, this study was conducted with the aim to evaluate the Attitude, Adeptness and Awareness in Managing Medical Emergencies Among Pediatric Dentists and Post Graduate students of Gujarat state.

METHODOLOGY

This was a Cross-sectional survey conducted in the Gujarat state, India. After getting approval from the ethical committee of the university, a self-administered questionnaire was prepared to evaluate the knowledge and competence for dealing medical emergencies. The Questionnaire was divided into two parts. Demographic data which included years of practice and whether the responder was Post Graduate Student/ Clinician/ Academician/Academician and Clinician was the first part of questionnaire. The second part contained 17 questions pertaining to knowledge, attitude, and perceived confidence in handling medical emergencies in the dental clinic. The questions included were close ended with either Yes/no or multiple-choice responses making them distinct and easy to respond. The formed questionnaire was validated and was forwarded to 150 Participants which included Post Graduate students and Pediatric Dentists of Gujarat. After 2 gentle digital reminders, 104 responses were accounted.

STATISTICALANALYSIS

The responses for the questionnaire were in the form of Categorical data which were converted into numerical data to calculate counts and percentages for statistical analysis. Non-Parametric Chi square test

was used to do analysis of the obtained data. Data was tabulated and analysed using Statistical Package for Social Sciences (SPSS) version 20.0. The confidence interval determined was 95% and Statistical significance value was accepted at $P < 0.05$ to determine significance of various responses.

RESULTS

Sample Distribution in the study based on practice level (TABLE 1)

TABLE 1

`Respondents	Number	Percentages
Clinical Practitioner	39	37.5
Clinical Practitioner associated with Academics	20	19.23
Post Graduate Student	45	43.26
Total	104	100

Attitude and Practices regarding medical emergency among the specialists:

In the present study, 60% responders said that detailed systemic history of patients was recorded before initiating any treatment. However only 41 % responders deemed it necessary to record vital signs before proceeding with the treatment which was a statistically significant finding in our study. On being asked about availability of Emergency kits and drugs in their practice, almost 83 % (majority of which were Clinicians) had an emergency kit ready to be used if needed and the kit contained Adrenaline drug most commonly. (TABLE 2)

TABLE 2 Attitude and Practices regarding medical emergency

	Clinician n (%)	Academician n (%)	Clinician and Academician n (%)	Post Graduate Student n (%)	Total n (%)	P Value
Do you record detailed medical history of the patients before treatment?						
Yes	17 (43.6)	0 (0)	14 (70)	32 (71.1)	63 (60.6)	0.090 NS
No	2 (5.1)	0 (0)	0 (0)	1 (2.2)	3 (2.9)	
Occasionally	20 (51.3)	0 (0)	6 (30)	12 (26.7)	38 (36.5)	
Total	39	0	20	45	104	
Do you check vital signs of patient before every procedure?						
Yes	19 (48.7)	0 (0)	8 (40)	16 (35.6)	43 (41.3)	0.023 S
No	10 (25.6)	0 (0)	0 (0)	14 (31.1)	24 (23.1)	
Occasionally	10 (25.6)	0 (0)	12 (60)	15 (33.3)	37 (35.6)	
Total	39	0	20	45	104	
Do you have an emergency kit in your clinic?						
Yes	34 (87.2)	0 (0)	17 (85)	36 (80)	87 (83.7)	0.664 NS
No	5 (12.8)	0 (0)	3 (15)	9 (20)	17 (16.3)	
Total	39	0	20	45	104	
Which emergency drugs are available in your clinic if required?						
Adrenaline	15	0	6	16	37	0.665 NS
Anti-Histamine	12	0	1	11	24	
Atropine	11	0	2	9	22	
Hydrocortisone	11	0	1	3	15	
Diazepam	12	0	4	8	24	
All of the above	11	0	12	20	43	
None of the above	3	0	1	5	9	
Total	75	0	27	72	174	

Adeptness in dealing Medical Emergencies

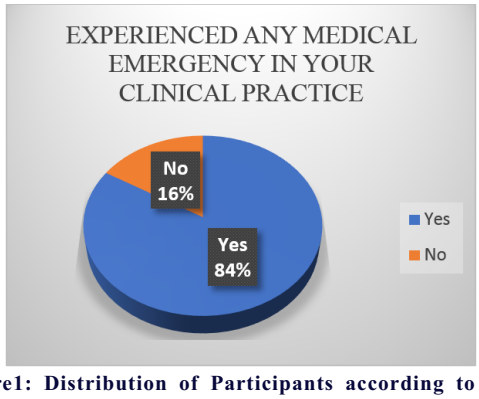

Figure1: Distribution of Participants according to their experience of medical emergencies

Figure 1 indicates that almost 84 % responders in this study had experienced some form of medical emergency in their practice. The most commonly encountered emergencies were Syncope (70%) followed by seizure episodes (40%) and Allergic reactions (31%) as depicted in Figure 2. When asked about the approach to confidently administer any emergency drug through parenteral route, 58 % of the responders lacked confidence to administer drug through IM or IV route whereas 27 % responders were unsure and only 15 % were assertive to administer the drugs without any adverse event (Figure 3). Figure 4 depicts the percentage of responders who are certified to perform Basic Cardiopulmonary Life Support. Only 34.6 % responders were certified and rest 65.4% were not trained which might make them less efficient to manage the emergency if needed.

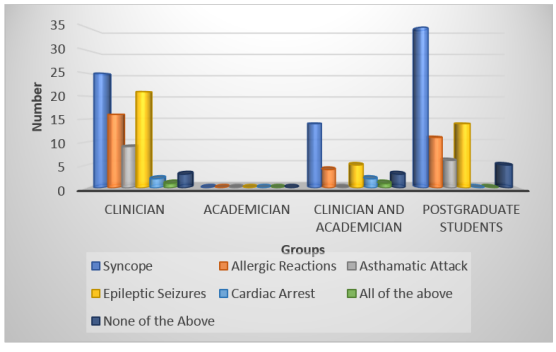

Figure 2: Commonly encountered Medical emergencies in dental clinic

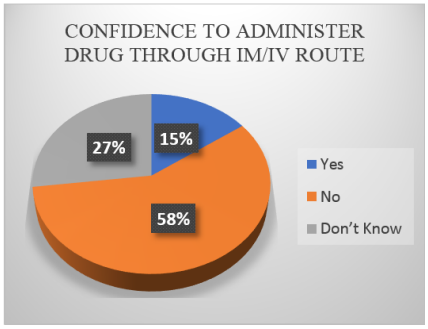

Figure 3: Percentage of participants confident to administer Drug through parenteral route

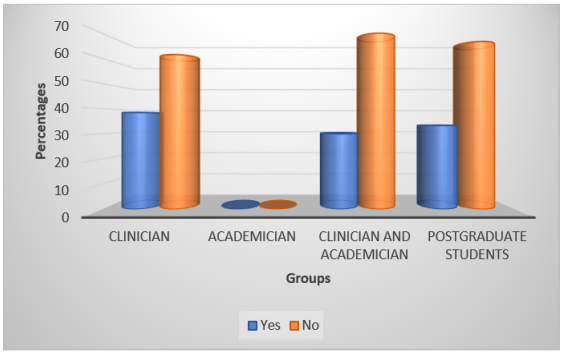

Figure 4: Percentage of participants trained to perform BLS

Knowledge and Awareness to deal medical emergency: (TABLE 3)
The responders were assessed for the basic algorithm to follow when encountered with a medical emergency. Majority of the participants (61.5%) stated to follow P-A-B-C-D which was the correct sequence to perform. Regarding responders' knowledge to deal with an unresponsive patient, prompting EMS followed by putting the patient in recovery position were the most selected options.

The knowledge reported regarding positioning a patient in syncope stated that 71% preferred placing the patient in Trendelenberg position while 14 % opted for upright position. Majority of the participants (74%) mentioned that for CPR the correct location to perform chest compression is at a distance of 2 fingers above the xiphoid process of the sternum. For the compression ventilation ratio, 35 % opted for 15:1, 42% responders opted for 30:2 and 12.5% opted for 15:2.

Adrenaline (73%) was the most preferred drug to manage anaphylactic reactions followed by Antihistamine (18%). Furthermore, 45 % participants opted to detect allergic reactions to LA using patch test while 25 % preferred subcutaneous test (P=0.017). Majority of the responders were apprised of not to restrict the movement of patient during epileptic episode. Very few participants were confident to inject Diazepam IV immediately. However, to manage a patient choking, the line of action of most of the responders was to perform the Heimlich Maneuver and asking the patient to cough deliberately.

Table 3 Awareness and Knowledge to deal medical emergency

	Clinician n (%)	Academician n (%)	Clinician and Academician n (%)	Post Graduate Student n (%)	Total n (%)	P Value
What should be the basic Algorithm in managing medical emergencies?						
B-A-C-D-P	4 (10.3)	0 (0)	0 (0)	6 (13.3)	10 (9.6)	0.242 NS
P-A-B-C-D	27 (69.2)	0 (0)	15 (75)	22 (48.9)	64 (61.5)	
A-B-C-D-P	7 (17.9)	0 (0)	4 (20)	16 (35.6)	27 (26)	
D-P-A-C-B	1 (2.6)	0 (0)	1 (5)	1 (2.2)	3 (2.9)	
Total	39	0	20	45	104	
How will you deal with an unresponsive patient?						
Observe	8	0	2	9	19	0.124 NS
Start CPR	8	0	11	11	30	
Prompt EMS	23	0	12	31	66	
Recovery Position	21	0	10	10	41	
Don't Know	0	0	6	1	7	
Total	60	0	41	62	163	
What should be the ideal position for a patient suffering from syncope?						
Upright	8 (20.5)	0 (0)	3 (15)	4 (8.9)	15 (14.4)	0.248 NS
Prone	5 (12.8)	0 (0)	0 (0)	2 (4.4)	7 (6.7)	
Semiprone	2 (5.1)	0 (0)	1 (5)	5 (11.1)	8 (7.7)	
Trendelenberg	24 (61.5)	0 (0)	16 (80)	34 (75.6)	74 (71.2)	
Total	39	0	20	45	104	
What is the correct location for chest compression during CPR?						
Midchest	8 (20.5)	0 (0)	5 (25)	6 (13.3)	19 (18.3)	0.230 NS
Left side of the chest	4 (10.3)	0 (0)	0 (0)	2 (4.4)	6 (5.8)	
Right side of the chest	2 (5.1)	0 (0)	0 (0)	0 (0)	2 (1.9)	
At a distance of two fingers above the Xiphoid Process of Sternum	25 (64.1)	0 (0)	15 (75)	37 (82.2)	77 (74)	
Total	39	0	20	45	104	
What is the correct Compression Ventilation ratio?						
15:2	5 (12.8)	0 (0)	1 (5)	7 (15.6)	13 (12.5)	0.119 NS
3:2	3 (7.7)	0 (0)	3 (15)	4 (8.9)	10 (9.6)	
30:2	11 (28.2)	0 (0)	9 (45)	24 (53.3)	44 (42.3)	
15:1	20 (51.3)	0 (0)	7 (35)	10 (22.2)	37 (35.6)	
Total	39	0	20	45	104	
Choice of drug for Anaphylactic reaction						
Hydrocortisone	3 (7.7)	0 (0)	2 (10)	4 (8.9)	9 (8.7)	0.282 NS
Adrenaline	33 (84.6)	0 (0)	13 (65)	30 (66.7)	76 (73.1)	
Anti-Histamine	3 (7.7)	0 (0)	5 (25)	11 (24.4)	19 (18.3)	
Glyceryl Trinitrite	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Total	39	0	20	45	104	
What test would you perform clinically in a patient to detect allergic reaction to L.A?						
Patch test	11 (28.2)	0 (0)	10 (50)	26 (57.8)	47 (45.2)	0.017 S
Prick Test	10 (25.6)	0 (0)	0 (0)	6 (13.3)	16 (15.4)	
Intradermal test	4 (10.3)	0 (0)	4 (20)	7 (15.6)	15 (14.4)	
Subcutaneous Test	14 (35.9)	0 (0)	6 (30)	6 (13.3)	26 (25)	
Total	39	0	20	45	104	
In a situation if a patient has an epileptic seizure while undergoing treatment on the dental chair, what would you not do?						
Let the episode cease	10	0	5	5	20	0.136 NS
Restrain the movements	27	0	9	20	56	
Stop the Dental Procedure	4	0	5	16	25	

Inject IV Diazepam	6	0	2	7	15	
Total	47	0	21	48	116	
What would be your immediate action if the patient is choking?						
Examine the mouth	8	0	11	11	30	0.086 NS
Ask the patient to cough	12	0	6	17	35	
Heimlich Maneuver	22	0	11	22	55	
Chest X Ray	10	0	0	9	19	
Don't Know	0	0	0	2	2	
Total	52	0	28	61	141	

DISCUSSION

Medical emergencies can occur to any person no matter what the time or the place it is. It is more common in dental clinics due to the stress the patient takes. The dentist however should be physically and mentally prepared to act swiftly if the need arises. According to the Revised Dentists (Code of Ethics) Regulations (2014) by the Dental Council of India, a dentist is not bound to treat each and every patient requesting his services but he is obligated to attend and treat emergencies reporting to the clinic. In a survey done by Chapman et al including 4000 dentists, they reported an incidence of 7.5 emergency situations per dentist in their practice over a period of 10 years. [9]

The available statistics suggest that Fear, discomfort and Anxiety are the common triggering factors for occurrence of medical emergencies. However, while dealing with a child patient, these factors play a major role because children are likely to get more anxious and uncooperative either due to separation from their parents or any subjective / objective fear. If the dentist can alleviate these fears from the child's mind through appropriate behaviour management and pain control technique, it can act as major step to prevent occurrence of any possible medical emergency. Medical emergency can also be faced due to underlying systemic disorder in children about which their parents are unaware of because it has not yet been diagnosed.

Hence it is essential for dentists to acquire basic knowledge to identify, evaluate and intervene a potentially life-threatening condition in his premises and manage efficiently until the patient is transported to a more efficient medical facility. The paramount step to prevent any untoward event is to record a detailed medical and dental history in the first appointment before commencing any procedures. 60 % participants in this study recorded detailed systemic history before starting the treatment. Questionnaires should be filled and the records should be maintained for any future references. The Dentist after detailed examination can assign the patient to a physical status category by the ASA PS which has been adapted by Malamed and McCarthy in dentistry.[1]

Recording vital signs (BP, pulse, respiratory rate, and temperature) before initiating any procedure can give a baseline measurement from which alterations in the patient's condition can be determined. As this is not mandatory, very few practitioners record it. [10] Our results match with the study done by Albelaihi et al, where it was reported that practioner recorded vital signs when patient's condition required to do so.[11]

The most commonly encountered medical emergency reported in our study is syncope which is in agreement to studies done by Mukherji et al , Mohideen et al [2] [12]. Dental phobia is majorly due to fear of injections and has led to many cases of vasovagal syncope. To prevent its occurrence the dentists must imply various distraction techniques to allay the anxiety and fear in children. In case of any emergency, not only the dentist but his entire team i.e. Dental assistants and auxiliary staff should have a team approach and act their part in handling the situation. The dental practitioner should ascertain that the clinic has the recommended equipments and emergency drugs required until the EMS are activated.

Though different countries follow different guidelines, according to the Guidelines by Resuscitation Council of UK (2013) and ADA council, [13] it is mandatory for a Dentist to have an emergency kit with minimum drugs (Five non injectable and two injectable) which include 1. Adrenaline injection 2. Glyceryl trinitrate spray 3. Histamine Blocker 4. Oxygen 5. Aspirin dispersible 6. Bronchodilator 7. Oral glucose solution/tablets/gel/powder. [14][15] Only the availability of the emergency kit is insufficient unless the dentist is prepared to use it adequately.

Basic Life Support aims to ensure patient's continuous respiration and prevent inadequate circulation through CPR until the emergency services arrive. [16] It is a skill which should be acquired by all the dentists regardless of their speciality. A dentist can confidently assess the patient's breathing and circulation and if needed carry out effective expired air resuscitation (EAR) and Cardio-pulmonary resuscitation (CPR) only if they are trained to do so. The entire dental staff team should also be encouraged to attend courses on basic resuscitation and run practice drills.

Basic Algorithm for managing patients during emergency is P- A- B- C- D. Odai et al in their review article have recommended D-R-S-A-B-C as basic sequential steps to ensure an adequate delivery of oxygenated blood to the brain prior to the delivery of definitive care.[17]

D = Check for **D**anger
R = Assess **R**esponsiveness which includes
(**AVPU =A-a**lert **V**-response to **v**erbal stimulus **P**-response to **p**ain **U**-**u**nresponsive)
S= **S**end or **S**hout for Help
A = Assess **A**irway for Obstruction
B = Assess **B**reathing
C = Assess **C**irculation

In our study 65.4% responders lacked training for BLS and were not confident to perform it which is in agreement to a studies conducted by Neha et al[18] and Goel et al[19] where they stated that dental students had a positive attitude toward BLS while they severely lacked its knowledge. The present dental curriculum does not impart training to the students to perform BLS. The students should be given in depth knowledge about CVS and respiratory systems with basic skills of BLS which should be reinforced every year. According to the American Heart Association (AHA) in 2015, reinforcement cycles every 2 years is not ideal. [20] These can be attested from studies conducted by Chandrasekharan et al and Sudeep et al which reported that knowledge about BLS was poor among dental, medical and nursing students needing improvement and updation. [21], [22] Lack of resources and limited time along with busy schedule of the pre-existing work act as barrier to include BLS / ALS skill acquisition in curriculum. [23] The students thus have few opportunities to assimilate the technique correctly which makes them insecure and less confident to perform them. It is the need of hour to include these courses in form of Seminars, CDE, lectures and clinical presentation on mannequins with help of medical and paramedical professionals. [24] Several organizations have been attempting to develop a Dental Advanced Life Support (DALS) program for dental environment since 2015. PALS (Pediatric Advanced Life support) which includes Core cases and respiratory cases in children should be mandatory for practicing pediatric dentists. [25]

In a pediatric patient cardiorespiratory arrest is not as frequent as seen in the adults. Even if it occurs, it might not be due to cardiac aetiology but secondary to respiratory obstruction/ insufficiency. The priority during CPR is to reoxygenate and ventilate the child. For infants ventilation is done at rate of 1 breath/3 seconds and for children of 8 years or older, at a rate of 1breath/5 seconds. Excessive forceful ventilation should be avoided as it leads to gastric distension and regurgitation. Resuscitation in children and infants should be done at chest compression ratio of 30:2 with 5 initial ventilations prior to starting the compressions. Compressions should be done by using either one or both the hands for older children while in infants only 2 fingers suffice the purpose. Sufficient force should be used to compress the chest only till 1/3 rd of its depth which is approximately 4 centimetres in infants and 5 centimetres in older children. Generally, AEDs and defibrillation are not needed in children but if required Pediatric electrode pads can be used which if unavailable can be replaced by adult Electrodes by orienting them antero-posteriorly.[26]

Anaphylaxis and allergic reactions can occur frequently in children.

The pediatric drug dosage for anaphylactic reaction is Adrenaline 1:2,000 (0.15mg/kg) available as 1 preloaded syringe and 3 x 1 mL ampules of 1:1,000. Adult dose for the same is Adrenaline 1:1000 (0.3 mg/kg). For allergic reactions Diphenhydramine can be administered which is available as 2-3 x 1 mL ampules. [17] If the patient suffers seizures during treatment, it should be immediately stopped and restrictive clothes should be loosened. Priority should be maintaining the airway patency and the dentist should never attempt to restrict the movements and the responders in our study were aware of it. The seizures may be triggered due to fear or pain, thus gets subsided within few minutes. But if the episode continues for more than 4 minutes, EMS should be called immediately. IV diazepam can be administered if the dentist is confident to do the procedure but in our study the majority of the participants lack the necessary skill and thus were not confident. Simulation Lab courses should be made mandatory in the curriculum to make them proficient.

In Pediatric dentistry, choking of the child due to inadvertent swallowing of foreign objects is more common. Respiratory obstruction can also be seen due to rapid tongue movements or vomitus/blood which in severe cases lead to cyanosis and laryngeal spasm. In such situation the dentist should first inspect the oral cavity and try to remove the obstruction by proper suction. If unsuccessful the child should be asked to cough deliberately. If the foreign object is still obstructing the airway sharp deliberate blows can be delivered on the back of child between shoulder blades while supporting child's chest. Heimlich Maneuver can be performed in children by using gentle but firm pressure to thrust upwards and inwards by kneeling at feet level placing the heel of one hand in the middle of body between the navel and ribs and other hand on the its top. However, if the obstruction still persists it is advisable to detect the object's location by a chest Xray and seek for immediate medical advice.[16]

CONCLUSION

The following conclusions can be drawn from this study

1. Majority of the pediatric dentists and PG students possessed the knowledge about medical emergencies but lacked the confidence to handle them.
2. Practitioners should acquire training through simulation lab courses for handling emergency situations and be confidently prepared to tackle them with required drugs and equipments in their clinics.
3. Skills and training for BLS and ALS should be included in the dental curriculum and reinforced every year to make the students proficient in recognizing and managing the medical emergency arising in dental clinic.

REFERENCES

1. Sakr, F., Al-Obaidy, K., Shetty, L., Behery, F., Assery, M., Adam, A. N., & Patel, M. (2016). Formulation of guidelines to resolve medical emergencies in dental practice: An overview. Saudi Journal of Oral Sciences, 3(1), 3. doi:10.4103/1658-6816.174289
2. Mukherji, A., Singh, M., Nahar, P., Bhuvaneshwari, S., Goel, S., & Mathur, H. (2019). Competence of handling medical emergencies among dental graduates and post-graduate students – A cross-sectional questionnaire study. Journal of Indian Academy of Oral Medicine and Radiology, 31(2), 107. doi:10.4103/jiaomr.jiaomr_24_19
3. Wilson MH, McArdle NS, Fitzpatrick JJ, Stassen LFA. (2009) Medical emergencies in dental practice. Journal of the Irish Dental Association 55(3),134-143.
4. Stafuzza, T. C., Carrara, C. F., Oliveira, F. V., Santos, C. F., & Oliveira, T. M. (2014). Evaluation of the dentists' knowledge on medical urgency and emergency. Brazilian Oral Research, 28(1), 1-5. doi:10.1590/10.1590/1807-3107bor-2014.vol28.0029
5. Anders, P. L., Comeau, R. L., Hatton, M., & Neiders, M. E. (2010). The Nature and Frequency of Medical Emergencies Among Patients in a Dental School Setting. Journal of Dental Education, 74(4), 392-396. doi:10.1002/j.0022-0337.2010.74.4.tb04883.x
6. Goepferd S. J. (1979). Medical emergencies in the pediatric dental patient. Pediatric dentistry, 1(2), 115–121.
7. Gupta, T., Aradhya, M. S., & Anup, N. (2008). Preparedness for Management of Medical Emergencies Among Dentists in Udupi and Mangalore, India. The Journal of Contemporary Dental Practice, 9(5), 92-99. doi:10.5005/jcdp-9-5-92
8. Hicks, C. G., Jones, J. E., Saxen, M. A., Maupome, G., Sanders, B. J., Walker, L. A., . . . Tomlin, A. (2012). Demand in Pediatric Dentistry for Sedation and General Anesthesia by Dentist Anesthesiologists: A Survey of Directors of Dentist Anesthesiologist and Pediatric Dentistry Residencies. Anesthesia Progress, 59(1), 3-11. doi:10.2344/11-17.1
9. Chapman, P. J. (1997). Medical emergencies in dental practice and choice of emergency drugs and equipment: A survey of Australian dentists. Australian Dental Journal, 42(2), 103-108. doi:10.1111/j.1834-7819.1997.tb00104.x
10. Kalladka, M., Greenberg, B. L., Padmashree, S. M., Venkateshaiah, N. T., Yalsangi, S., Raghunandan, B. N., & Glick, M. (2013). Screening for coronary heart disease and diabetes risk in a dental setting. International Journal of Public Health, 59(3), 485-492. doi:10.1007/s00038-013-0530-x
11. Alshahrani, F., Albelaihi, H., Alweneen, A., & Ettish, A. (2017). Knowledge, attitude, and perceived confidence in the management of medical emergencies in the dental office: A survey among the dental students and interns. Journal of International Society of Preventive and Community Dentistry, 7(6), 364. doi:10.4103/jispcd.jispcd_414_17
12. Mohideen K, Thayumanavan B, Balasubramaniam AM, Vidya KM, Rajkumari S, Bharkavi SKI. (2017) Basics of management of medical emergencies in dental office and emergency drug kit. International Journal of Scientific Studies, 5(4)73-8. doi: 10.17354/ijss/2017/378
13. Malamed SF. (2000). Managing medical emergencies in the dental office, ADA Guide to Dental Therapeutic 2nd edition. Chicago. ADA Pub. 293-305.
14. Haas, D. A. (2006). Management of Medical Emergencies in the Dental Office: Conditions in Each Country, the Extent of Treatment by the Dentist. Anesthesia Progress, 53(1), 20-24. doi: 10.2344/0003-3006(2006)53[20:MOMEIT]2.0.CO;2
15. Gabel CK. (2014) Medical emergencies in dental practice. Dental Health, 53,26-8.
16. Carvalho, R. M., Costa, L. R., & Marcelo, V. C. (2008). Brazilian Dental Students' Perceptions About Medical Emergencies: A Qualitative Exploratory Study. Journal of Dental Education, 72(11), 1343-1349. doi:10.1002/j.0022-0337.2008.72.11.tb04617.x
17. Uyamadu J, Odai CD. (2012) A review of medical emergencies in dental practice. Orient Journal of Medicine 24(3-4),1 9
18. Baduni, N., Prakash, P., Srivastava, D., Sanwal, M., & Singh, B. (2014). Awareness of basic life support among dental practitioners. National Journal of Maxillofacial Surgery, 5(1), 19. doi:10.4103/0975-5950.140159
19. Goel, S., Chaudhary, G., Kaura, S., & Marria, G. (2017). Knowledge and attitude toward "basic life support" in dental college. Indian Journal of Dental Sciences, 9(2), 73. doi:10.4103/ijds.ijds_13_17
20. Mutz, V. S., & Cançado, R. P. (2017). Training study of undergraduate dentistry students in a public institution of Espírito Santo face to medical urgencies/emergencies. Revista Odonto Ciência, 32(1), 35. doi:10.15448/1980-6523.2017.1.26332
21. Chandrasekaran, S., Kumar, S., Bhat, S., Shabbir, M., Chandrasekaran, V., & Kumar, S. (2010). Awareness of basic life support among medical, dental, nursing students and doctors. Indian Journal of Anaesthesia, 54(2), 121. doi:10.4103/0019-5049.63650
22. Sudeep, C., Jain, J., Jain, V., Maliyil, M., Prataap, N., & Sequeira, P. (2014). Awareness of emergency drugs uses among students and teaching faculty in a dental college in Coorg, Karnataka. Journal of Indian Association of Public Health Dentistry, 12(3), 185. doi:10.4103/2319-5932.144791
23. Ajappa, A. K., P S, C. B., & Gowda, S. S. (2015). Effectiveness of BLS Training in improving the Knowledge and skills among Medical Interns. Journal of Educational Research & Medical Teacher, 3(1), 28-30.
24. Marchini L, Patrocínio MC, Rode SM.(2003) Plano de ensino de uma disciplina de "urgências e emergências em Odontologia". PGR: Pós-Grad Rev Fac Odontol São José dos Campos, 3(1), 105-12.
25. Kim, J. (2016). Pediatric advanced life support and sedation of pediatric dental patients. Journal of Dental Anesthesia and Pain Medicine, 16(1), 9. doi:10. 17245/ jdapm. 2016. 16.1.9
26. Guidelines: Paediatric advanced life support. Retrieved July 14, 2020, from https://www.resus.org.uk/library/2015-res uscitation-guidelines /paediatric-advanced-life-support? UNLID=65398243720207142025