

ORIGINAL RESEARCH ARTICLE

MEDICAL EMERGENCIES PREPAREDNESS IN DENTAL CLINIC AMONG POSTGRADUATE RESIDENTS
IN NEPAL

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ABSTRACT

Background: Serious medical emergencies in dental practices are generally rare (one in 3-5 years) but if it happens it is life threatening to the patient. Adequate knowledge and competency, training of the dental practitioners is necessary to avoid such life-threatening conditions. The study was conducted to assess the preparedness of medical emergencies among postgraduate dental students of Nepal.

Methods: An online questionnaire based cross-sectional study was conducted among all post graduate dental students from all the dental colleges of Nepal. Pretested, validated, close ended questionnaire was used. Questionnaire consisted of twenty medical emergency situations and five questions regarding self-evaluation of training regarding the management of medical emergencies. Chi-square test was used to assess association between competency in managing medical emergency situations and years of academic experience during post-graduation. P- value <0.05 was considered statistically significant.

Results: More than 70% participants answered correct management of medical emergency situations. Almost 20% disagreed and 20% don't know about the management of such situations. Only 28% received training in the management of medical emergencies during undergraduate dental program. More than 50% were moderately satisfied with their knowledge about medical emergencies.

Conclusions: The results of the study showed that knowledge to handle commonly occurring medical emergencies was higher. Most of the participants did not attend any training regarding medical emergencies. And those who attended felt there is need for further training in the management of emergency medical cases in the dental chair.

INTRODUCTION

Medical emergency is a condition which requires immediate treatment. It is usually unwanted and unexpected reaction. Serious medical emergencies in dental practices are generally rare (one in 3-5 year) but if it happens it is life threatening to the patient.¹ Most common medical emergency reported in dental clinic is vasovagal syncope followed by hypoglycaemias, seizure and allergic reactions.² The knowledge about the frequency and the type of a medical emergency is pivotal to implement the training and practice of all the dental staff, for an early diagnosis and management.³ Generally, for adequate knowledge and competency, training of the dental practitioners and adding adequate curriculum to manage emergencies, and training on the immediate use of emergency kit are necessary.^{4,5} Dentists are not aware or prepared enough to equip their offices with what is required for emergency/ urgency care; therefore, they are at a loss even before such situations may occur.⁶ There is lack of research regarding the knowledge and competency of management of medical emergencies among dental surgeons in Nepal. According to the study done in Nepal by Joshi et al⁷ almost 61.3% respondents had undergraduate emergency management

training of BLS, however they still felt incompetent in handling emergency events. The curriculum of undergraduate dentistry courses lacks contents needed for management of emergency situations and training related to such medical emergencies.²

The study aimed to assess the preparedness for medical emergencies at dental clinic among dental residents in Nepal and also to assess the need for training on the management of medical emergencies among postgraduates.

METHODS

An online questionnaire-based cross- sectional study was conducted from 22nd June -29th June 2022 among dental post-graduates (n=161) from all eleven dental colleges of Nepal. A google form was created and distributed to all the participants via online platform (Email, WhatsApp, Viber and Messenger). A total of 128 participants filled the form. Ethical approval for the study was obtained from the Institutional Review Committee, BPKIHS, Dharan (Ref. No: 228/078/079-IRC). All the postgraduate dental students with various areas of specialization in Nepal were included in the study.

Google form comprise of a pretested, validated closed-ended questionnaire adapted from the study Gazal et al⁸ was sent to participants via the online platform. The English questionnaire had three parts. In first part, demographic information including age, gender, area of practice, and year of studying. In the second part, 20 medical emergency cases frequently take place in the dental chair and their management protocol. The third part contained five questions regarding self-evaluation of training regarding the management of medical emergencies.

Considering 50% of participants responded correctly about medical emergency situations from the study Gazal et al⁸, the calculated sample size was 384. Applying finite population correction and 10% non-response rate, the minimum number of samples was 126. However, questionnaires were distributed to all 161 postgraduate students studying in medical and dental colleges all over Nepal.

After completion of the survey, data obtained were entered in Microsoft Excel Sheet version 2016 and analysed using the Statistical Package for Social Sciences (SPSS version 11.5). Descriptive statistics were calculated. Chi-square test was used to assess association between competency in managing medical emergency situations and years of academic experience during post-graduation. The value $P < 0.05$ was considered statistically significant.

RESULTS

Out of 161 students, almost 80% (128) had completed the questionnaire. The mean age (SD) of the participants was 29.2 (1.7). Most of the participants were female (68%). The distribution of participants according to their specialty is shown in Figure 1.

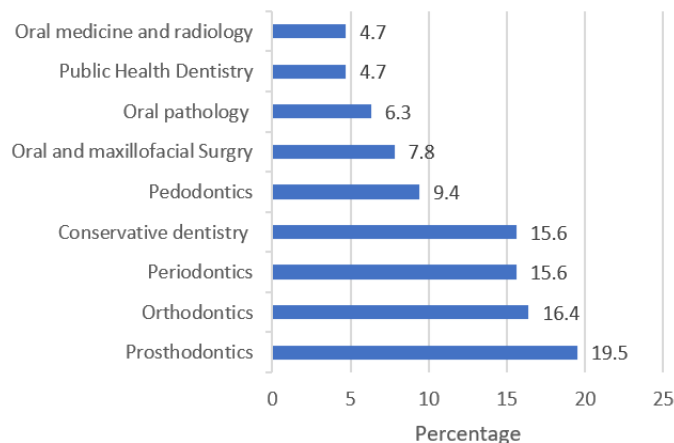


Figure 1: Distribution of participants according to their Specialty (128)

About 40% of the participants were in first year followed by second (35%) and third year (25%). Out of total participants, 41 % of them were from BPKIHS followed by TU, KU and NAMS (Figure 2).

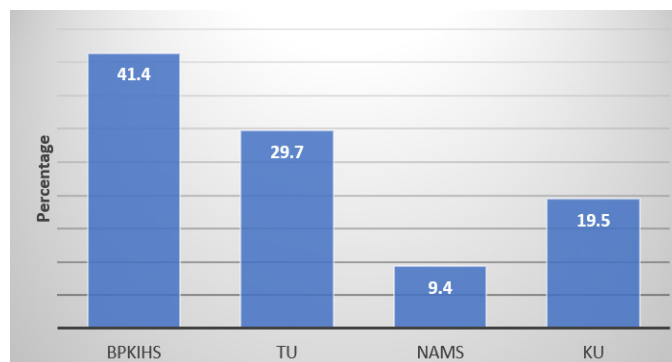


Figure 2: Distribution of participants according to the university currently studying MDS (N=128)

Table 1: Correct responses about management of medical emergency (N=128)

S. N	Medical scenarios	N (%)
1.	Fainting patient in dental chair	106 (82.8)
2.	Patient with hyperventilation	98 (76.6)
3.	Patient with postural hypotension	113 (88.3)
4.	Conscious patient with hypoglycaemia	127 (99.2)
5.	Unconscious patient with hypoglycaemia	104 (81.3)
6.	Epileptic seizure	105 (82.0)
7.	Crisis of hypoadrenalism	96 (75.0)
8.	Acute asthmatic attack	122 (95.3)
9.	Anaphylactic shock	116 (90.6)
10.	Deeply sedated with benzodiazepine overdose	90 (70.3)
11.	Sudden onset of brain stroke	106 (82.8)
12.	Psychiatric patient	95 (74.2)
13.	Crushed chest pain	114 (89.1)
14.	Episode of chest pain relieved by rest and nitrates	100 (78.1)
15.	Severe chest pain not relieved by rest and nitrates	91 (71.1)
16.	Sudden heart arrest	115 (89.8)
17.	Cardiopulmonary resuscitation steps	98 (76.6)
18.	Chronic liver disease needs dental extraction	101 (78.9)
19.	Known diabetes who becomes sweaty, with nausea and tachycardia	106 (82.2)
20.	Renal failure needs dental extraction	101 (78.9)

Majority of the participants (70%) enrolled in the study were aware about management of medical emergencies (Table 1).

Most of the participants agreed regarding the management of medical emergency scenarios. Detailed response for each

scenario is shown in Table 2.

The difference in knowledge among the three different years were not statistically significant ($p > 0.05$) (Table 3).

Table 2: Responses for various medical scenarios (N=128)

S. N	Medical scenarios	Agree	Disagree	Don't known
1.	Fainting patient in dental chair	106 (82.8)	22 (17.2)	0 (0)
2.	Patient with hyperventilation	98 (76.6)	18 (14.1)	12 (9.4)
3.	Patient with postural hypotension	113 (88.3)	12 (9.4%)	3 (2.3)
4.	Conscious patient with hypoglycaemia	127 (99.2)	0 (0)	1 (0.8)
5.	Unconscious patient with hypoglycaemia	104 (81.3)	10 (7.8)	14 (10.9)
6.	Epileptic seizure	105 (82)	15 (11.7)	8 (6.3)
7.	Crisis of hypoadrenalism	96 (75)	3 (2.3)	29 (22.7)
8.	Acute asthmatic attack	122 (95.3)	1 (0.8)	5 (3.9)
9.	Anaphylactic shock	116 (90.6)	9 (7)	3 (2.3)
10.	Deeply sedated with benzodiazepine overdose	90 (70.3)	1 (0.8)	37 (28.9)
11.	Sudden onset of brain stroke	106 (82.8)	6 (4.7)	16 (12.5)
12.	Psychiatric patient	95 (74.2)	22 (17.2)	11 (8.6)
13.	Crushed chest pain	114 (89.1)	3 (2.3)	11 (8.6)
14.	Episode of chest pain relieved by rest and nitrates	100 (78.1)	19 (14.8)	9 (7)
15.	Severe chest pain not relieved by rest and nitrates	91 (71.1)	9 (7)	28 (21.9)
16.	Sudden heart arrest	115 (89.8)	8 (6.3)	5 (3.9)
17.	Cardiopulmonary resuscitation steps	98 (76.6)	28 (21.9)	2 (1.6)
18.	Chronic liver disease needs dental extraction	101 (78.9)	23 (18)	4 (3.1)
19.	Known diabetes who becomes sweaty, with nausea and tachycardia	106 (82.8)	16 (12.5)	6 (4.7)
20.	Renal failure needs dental extraction	101 (78.9)	20 (15.6)	7 (5.5)

Table 3: Year-wise comparison of correct answers to the management of medical emergencies (N= 128)

S. N	Medical Emergency Scenario	1 st year	2 nd year	3 rd year	p value *
1.	Fainting patient in dental chair	40 (78.4)	37 (82.2)	29 (90.0)	0.35
2.	Patient with hyperventilation	36 (70.6)	31 (68.8)	31 (96.9)	0.17
3.	Patient with postural Hypotension	46 (90.2)	37 (82.2)	30 (93.7)	0.33
4.	Conscious patient with hypoglycaemia	51 (100)	45 (100)	31 (96.9)	0.22
5.	Unconscious patient with Hypoglycaemia	39 (76.5)	37 (82.2)	28 (87.5)	0.19
6.	Epileptic seizure	43 (84.3)	35 (77.8)	27 (84.4)	0.90
7.	Crisis of hypoadrenalism	41 (80.4)	31 (68.9)	24 (75.0)	0.33
8.	Acute asthmatic attack	47 (92.1)	44 (97.8)	31 (96.9)	0.64
9.	Anaphylactic shock	44 (86.3)	44 (97.8)	28 (87.5)	0.35
10.	Deeply sedated with Benzodiazepine overdose	40 (78.4)	29 (64.4)	21 (65.6)	0.24
11.	Sudden onset of brain stroke	45 (88.2)	36 (80.0)	25 (78.1)	0.73
12.	Psychiatric patient	38 (74.5)	35 (77.7)	22 (68.7)	0.90
13.	Crushed chest pain	47 (92.1)	40 (88.9)	27 (84.4)	0.40
14.	Episode of chest pain relieved by rest and nitrates	44 (86.3)	31 (68.9)	25 (78.1)	0.06
15.	Severe chest pain not relieved by rest and nitrates	40 (78.4)	33 (73.3)	18 (56.2)	0.24
16.	Sudden heart arrest	44 (86.3)	42 (93.3)	29 (90.6)	0.83
17.	Cardiopulmonary resuscitation steps	36 (70.6)	35 (77.8)	27 (84.4)	0.63
18.	Chronic liver disease needs dental extraction	37 (72.5)	38 (84.4)	26 (81.3)	0.70
19.	Known diabetes who becomes sweaty, with nausea and tachycardia	42 (82.3)	37 (82.2)	27 (84.4)	0.94
20.	Renal failure needs dental extraction	38 (74.5)	37 (82.2)	26 (81.3)	0.83

*Signifies p value < 0.05 [Chi-square test]

Of 128 participants very few 25.8% received training in the management of medical emergencies during undergraduate

dental program. Almost 74% participants never attended such programs. Other details are shown in Table 4.

Table 4: Participants' self-evaluation of their training, knowledge, and clinical competency in the management of medical emergencies (n=33)

Quality of training	N (%)
Poor	2 (6)
Fair	3 (9)
Good	11 (33.3)
Very good	15 (45.5)
Excellent	2 (6)
Satisfaction level with knowledge about medical emergencies	
Not at all satisfied	2 (6)
Slightly satisfied	6 (18.2)
Moderately satisfied	17 (51.5)
Very satisfied	8 (24.2)
Extremely satisfied	0
Self-evaluation of the clinical competency in dealing with medical emergencies	
Poor	3 (9)
Fair	19 (57.6)
Good	9 (27.3)
Very good	2 (6)
Excellent	0
Need for further training in the field of medical emergencies	33 (100)

DISCUSSION

Life-threatening situations can happen to anybody, anywhere, at any time. Due to the higher amount of stress that is frequently present, such circumstances are a little more likely to take place inside a dental office. For instance, fear and worry may increase the risk of medical problems including syncope and hyperventilation in these patients. Dentists need to be ready to handle any medical issues that may occur in the course of their work.⁴ Dentists need to be aware of the protocols and acceptable treatments for medical emergencies, as well as what a prudent person with the same level of education and experience would have done in the same or a similar kind of case. This study was conducted with the aim of assessing the preparedness of medical emergencies in dental clinic among post graduate dental students from all over Nepal.

This questionnaire-based study helped us to determine knowledge base of post graduate dental students to provide appropriate treatment in case of medical emergencies. Therefore, proportions of correct answers were used to assess the preparedness of the participants. More than 70% of the participants responded correctly for all twenty medical emergency situations. This finding is similar to the finding obtained by Amirchaghmaghi et al⁹ where 68.8% had a good knowledge about preparedness of medical emergencies. This result is lower than the result obtained by Sharma et al¹⁰ where 95% of the postgraduate students gave positive response about diagnosing medical emergencies. Also, this finding is not consistent with the findings of Kumarwami et al¹¹ where 86% were sure about handling any emergency situations. This might be because of lack of training regarding medical emergencies. More than 90% correct answers were obtained in managing angina, asthma and hypoglycaemia. This is concordance with the result obtained by Bell et al¹² where 95% participants were

able to manage similar medical emergencies. This showed a striking contrast to the study by Girdler and Smith in 1999¹³ among qualified dental practitioners in northern England, where only vasovagal syncope had a positive response rate greater than 95%.

More than 70% of the participants responded correctly to life threatening condition such as crushing chest pain. This result is higher in comparison to the result obtained by Gazal et al⁸ where only 54% responded correctly. Similarly, about 95.3% of participants responded correctly for managing acute asthmatic attack. This result is not in concordance with study done by Gupta et al¹⁴ where only 20.7% were able to manage acute asthmatic patients. Similarly, 76.5% responded correctly about CPR steps. This is quite higher as compared to study done by Al-Shamiri et al¹⁵ where only 31.5% responded correctly. More than half (58.71%) of dentists declared being competent in CPR in study done by Smereka et al¹⁶ This result is opposite to our findings where most of the participants were able to treat those situations. This may be due to the current knowledge they have obtained from their curriculum.

Although BLS training is essential for dealing with medical crises, personnel training goes beyond BLS. To hone the diagnosis and management skills of acute medical situations, it also includes taking online courses, practicing, and attending continuing education classes.¹⁷

In the present study, only 25.8% dental practitioners gave positive response regarding whether they attended any workshop on emergency training or management programs. Studies conducted by Gupta et al¹⁴ and Verma et al¹⁸ showed that 90.7% and 74.09% of participants gave positive response. This result may be due to lack of training about medical emergencies to the dental students in Nepal. Our result is

higher than the study conducted by Kumarswami et al¹¹ in which only 7.6% had attended workshops regarding this. An interesting finding was that there were less proportions of participants attending training regarding medical emergencies but their knowledge regarding such scenarios were higher. This may be due to their theoretical knowledge obtained from their curriculum. This result is in concordance with the study done by Hashim et al¹⁹ where there was deficiency in personnel training.

Among those who attended training regarding medical emergencies, 24.2% were very satisfied with their training which is higher than result obtained by Gazal et al.⁸ The study found only 11.2% dental students were very satisfied with their training. Our study findings revealed that only 6% of participants felt very confident in managing such situations. This result is almost similar to a study done by Bell et al¹² where 4% of students felt very confident. One of the Nepalese study⁷ showed that 61.3% reported they had adequate undergraduate training to manage emergency but they still felt incompetent in handling emergency events which is not in concordance with our study.

This study showed that all participants felt the need of further training as they were less competent in managing emergency situations. This suggest that regular training can help to enhance students' preparedness in the management of medical emergencies in the dental setting. The level of understanding about medical emergencies was unaffected greatly by being a specialist of a different year which is similar to the study done by Al-Iryani et al.²⁰ Many studies have highlighted the need to improve training of dentists in medical emergencies by participation in BLS courses and specialized programs. It was emphasized that Advanced Life Support/ Advanced Cardiovascular Life Support (ALS/ ACLS) courses should be more focused on dentistry related issues, practical skill training and BLS competence.¹⁶ All those who attended

training, felt that they need further training in future as they felt incompetent in handling emergency situations. This result is almost similar to the finding of Joshi et al⁷ where 92.7% felt need of hands-on course in future.

This study found that although fewer students had received training on dealing with medical emergencies, their knowledge of preparedness of medical emergencies were good which can be seen by their positive responses for each situation.

Since this was a questionnaire-based study, there may be chance of agreement bias. Most of the participants selected a positive response. This might affect true knowledge of preparedness of medical emergencies.

CONCLUSION

The results of the study showed that knowledge to handle commonly occurring medical emergencies is higher. Most of the participants did not attend any training regarding medical emergencies. And those who attended, they felt there is need for further training in the management of emergency medical cases in the dental chair. This is because they were moderately satisfied with their current knowledge about medical emergencies and self-evaluation of clinical competency was fair. We may conclude that in Nepal scenario, trainings and practical lessons pertaining to such medical emergencies are necessary.

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REFERENCES:

- Atherton GJ, McCaul JA, Williams SA. Medical emergencies in general dental practice in Great Britain Part 1: their prevalence over a 10-year period. *Br Dent J*. 1999 Jan;186(2):72–9. [DOI]
- Greenwood M. Medical emergencies in the dental practice. *Periodontology 2000*. 2008 Jan 1;46:27–41. [DOI]
- Varoni EM, Rigoni M, Lodi G, Sardella A, Muti P, Vitello A, et al. Medical emergencies in dental practice: A nationwide web-based survey of Italian dentists. *Heliyon*. 2023 Mar ;9(3):e13910. [DOI]
- Bajaj PK. Emergency drugs and equipments in dental practice. *Journal of Advanced Medical and Dental Sciences Research*. 2014 Oct;2(4).
- Rosenberg M. Preparing for Medical Emergencies. *The Journal of the American Dental Association*. 2010 May;141:S14–9. [DOI]
- Stafuzza TC, Carrara CFC, Oliveira FV, Santos CF, Oliveira TM. Evaluation of the dentists' knowledge on medical urgency and emergency. *Braz oral res*. 2014 Aug 18;28(1):1–5. [DOI]
- Joshi S, Acharya S. Medical Emergencies in Dental Practice - A Nepalese study. *Orthod J Nepal*. 2015 Dec 1;5(2):33–7. [DOI]
- Gazal G, Aljohani H, Al-Samadani KH, Nassani MZ. Measuring the Level of Medical-Emergency-Related Knowledge among Senior Dental Students and Clinical Trainers. *IJERPH*. 2021 Jun 27;18(13):6889. [DOI]
- Amirchaghmaghi M, Sarabadani J, Delavarian Z. Preparedness of specialist dentists about medical emergencies in dental office-Iran. *Aust J Basic Appl Sci*. 2010;4:5483. [PMID]
- Sharma P, Khirney P, Pradhan P, Chettri P, Dahal P, Bhatt S. Knowledge, attitude, and practices of dental students regarding medical emergency preparedness in Paonta Sahib, Himachal Pradesh. *Int J Community Dent*. 2019;7(1):11. [DOI]
- Kumarswami S, Parmar M, Patel M, Shukla M, Tiwari A, Bhatt A. Evaluation of preparedness for medical emergencies at dental offices: A survey. *J Int Soc Prevent Communit Dent*. 2015;5(1):47. [DOI]
- Bell G, James H, Kreczak H, Greenwood M. Final-Year Dental Students' Opinions of their Training in Medical Emergency Management. *Prim Dent J*. 2014 Mar ;3(1):46–51. [DOI]
- Girdler NM, Smith DG. Prevalence of emergency events in British dental practice and emergency management skills of British dentists. *Resuscitation*. 1999 Jul ;41(2):159–67. [DOI]
- Gupta T, Aradhya MRS, Anup N. Preparedness for Management of

- Medical Emergencies Among Dentists in Udupi and Mangalore, India. *The Journal of Contemporary Dental Practice*. 2008 Jul;9(5):92–9. [\[PMID\]](#)
15. Al-Shamiri HM, Al-Maweri SA, Shugaa-Addin B, Alaizari NA, Hunaish A. Awareness of basic life support among Saudi dental students and interns. *Eur J Dent*. 2017 Oct;11(04):521–5. [\[DOI\]](#)
 16. Smereka J, Aluchna M, Aluchna A, Szarpak Ł. Preparedness and attitudes towards medical emergencies in the dental office among Polish dentists. *International Dental Journal*. 2019 Aug;69(4):321–8. [\[DOI\]](#)
 17. Al-Sebaei MO, Alkayyal MA, Alsulimani AH, Alsulaimani OS, Habib WT. The preparedness of private dental offices and polyclinics for medical emergencies: A survey in Western Saudi Arabia. *SMJ*. 2015 Mar;36(3):335–40. [\[DOI\]](#)
 18. Varma LSC, Pratap KVN, Padma TM, Kalyan VS, Vineela P. Evaluation of preparedness for medical emergencies among dental practitioners in Khammam town: A cross-sectional study. *J Indian Assoc Public Health Dent*. 2015;13(4):422. [\[DOI\]](#)
 19. Hashim R, Mathew L, Rustom S, Amer F, Odeh R. Emergency medical care in dentistry: A cross sectional analysis of competencies for undergraduate students. *Int J Crit Illn Inj Sci*. 2021;11(1):33. [\[DOI\]](#)
 20. Al-Iryani GM, Ali FM, Alnami NH, Almashhur SK, Adawi MA, Tairy AA. Knowledge and Preparedness of Dental Practitioners on Management of Medical Emergencies in Jazan Province. *Open Access Maced J Med Sci*. 2018 Feb 14;6(2):402–5. [\[DOI\]](#)