

ORIGINAL RESEARCH

Evaluation of Oral and Maxillofacial Surgeons' Knowledge, Experience, and Attitude Regarding Cardiopulmonary Resuscitation in Kerala

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ABSTRACT

Background: Only a limited amount of information is available regarding the frequency of emergencies in dentistry practises and the teams' training in life support. A study was conducted in order to gauge oral and maxillofacial surgeons' proficiency in performing fundamental life-saving techniques in the event of an emergency. **Materials and Methods:** A cross-sectional study was carried out on a consecutive sample of 125 OMFS surgeons, including 58 postgraduate students and 67 MDS employees working in Kerala. An electronic survey was used to gather information about dentists' CPR knowledge and attitudes in light of the 2015 American Heart Association (AHA) guidelines update. Through emails and WhatsApp groups, the survey link was distributed to the targeted surgeons. The statistical software for social sciences (SPSS version 22) was used to analyse the data. Using the Chi-square test, associations between knowledge scores were evaluated. **Results:** Only 69.6% of oral surgeons in the current study possessed the necessary practical training to do CPR, despite the fact that 78% of them had undergone training in it. A correlation was observed between the years of work experience and technical knowledge ($r = 0.913$), Attitude and Knowledge ($r = 0.401$). There was a correlation ($r = 0.391$) between work experience and attitude. A correlation ($r = 0.420$) was also observed between age and experience. 27% of the 125 oral surgeons had a negative opinion towards CPR, while 69.5% of them had a good attitude. **Conclusion:** Indian dentists are highly qualified in a number of different dental specializations. To advance dentistry in India and deliver better, safer services to the populace, it is imperative to have a better understanding of medical emergencies.

Keywords: Cardiopulmonary arrest, Cardiopulmonary Resuscitation, BLS knowledge

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INTRODUCTION

Recently, there has been a lot of discussion on how to manage a patient who is medically impaired. Unfortunately, most of the literature on this subject is western-centric. Although human species and physiology remain unchanged, the challenges in South Asia, particularly India, originate from a significantly different societal structure, a significant urban-rural socioeconomic difference, and sociological factors that have a significant impact on the practise of medicine, Oral and maxillofacial surgeons and general dentists are all required to handle any medical crises that may occur in the course of their practise. In situations of medical crises such as sudden cardiac arrest, drowning, choking, trauma, and other life-threatening

situations, basic life support (BLS) is a life-saving technique. The process of chest compressions coupled with rescue breathing is known as cardiopulmonary resuscitation (CPR). The goal of CPR is to sustain a temporary blood flow that will preserve brain function until specialised care is available [1]. The most frequent emergency in dental practise follows the use of medications, most frequently sedatives, analgesics, and local anaesthetics.[2]. The dental office is the place where a drug-related emergency like anaphylactic shock is most likely to happen. One of the top causes of death in almost every country is sudden cardiac arrest (CA)[3]. Cardiac arrest can happen anywhere, even at a dental office. Time is of the importance since treating a cardiac arrest could

have possible poor consequences. The dental team must work together to efficiently activate the "Chain of Survival" during treatment[4]. Dentistry should regularly practise resuscitation procedures, and dentists, especially oral surgeons, should be trained in and prepared to perform CPR. In light of these facts, a study was carried out to evaluate oral and maxillofacial surgeons' understanding of cardiopulmonary resuscitation and how well they use it in their daily practise.

MATERIALS AND METHODS

This cross-sectional study was conducted using Google Forms from January 2023 to March 2023 to evaluate responses using 25 chosen BLS-related questions. A consecutive sample of 125 Oral and Maxillofacial Surgeons from various dental colleges, including 58 postgraduate students and 67 MDS staff took part in the study. A semi-structured online survey was made using Google Forms and adheres to the most recent American Heart Association (AHA)/European resuscitation council (ERC) recommendations from 2015 [5]. Through emails and WhatsApp groups, the survey link was distributed to the targeted surgeons. They had to use the Google Forms to provide their informed consent before they could begin filling out their questionnaire. Participants are automatically directed to study materials after obtaining the link and clicking it. All participants submitted demographic data, including their age, gender, educational background, and number of years practising dentistry, as well as details about how well they understood various BLS components, such as CPR training and attitudes, as well as their knowledge and experience with cardiac arrest and CPR. The validity and degree of repetition of the questions were verified beforehand among a group of 18 oral surgeons (Cronbachalpha = 0.78), and any necessary modifications were made after consulting with an

expert in emergency care. The survey's questions were all equally weighted. The final sample count did not include the response forms with incomplete information, and data collecting continued until 125 questionnaires were gathered.

Using the formula below, the right sample size was chosen.

- $n = Z^2P(1-P)/d^2$, where

- n is the sample size

- Z is the statistic corresponding to the level of Confidence (Z=1.96)

- P is expected prevalence

- d is precision

The Ethical Committee's approval and official authorization were obtained prior to the survey's launch.

DATA ANALYSIS

Information transferred from the survey proforma to a computer after the proformas were organised systematically. To analyse the data, a master chart was made in Microsoft Excel (2010). Each affirmative response received a score of "1" for data analysis, whereas each negative response received a score of "0". A total score was produced by adding the individual scores. The IBM Statistical Package for the Social Sciences (SPSS) version 22 was used to enter and analyse the data. Numbers and percentages are used to offer a descriptive analysis. Using the Chi-square test, associations between knowledge scores were evaluated. The correlation between the variables, such as scores of attitude, technical knowledge, age and work experience was examined using the Pearson correlation test. The significance level was established at $p \leq 0.05$.

RESULTS

Table 1 shows the distribution of the study participants by age, designation, gender, and experience.

Table 1. Demographic information on the participants (n=125)

Variables		Frequency (n)	Percentage (%)
Gender	Males	77	61.60
	Females	48	38.40
Age	>30 years	42	33.6
	30-50 years	61	48.8
	<50 years	22	17.6
Designation	Postgraduates	58	46.4
	MDS staff	67	53.6
Work Experience	>5 years	50	40
	5-10 years	59	47.2
	<10 years	16	12.8
Practical experience with CPR	Postgraduates	31	53.44
	MDS Staff	45	67.16
Have you taken a BLS course that included CPR training?	Yes	91	69.6
	No	38	30.4

CPR- Cardiopulmonary Resuscitation, BLS- Basic Life Support

48 women and 77 men doing post graduation and working and as oral surgeons made up the study's total participant count of 125. They were then divided into three groups based on the number of years of experience:

>5 Years (50), 5-10 Years (59), and <10 Years (16). Nearly 60.8% of people were found to be familiar with CPR, and 69.6% had received CPR training.

Table 2. Descriptive Statistics on Cardiopulmonary Resuscitation Knowledge (n=125)

Statements	Responses, n(%)		Chi-square	p value
	Correct	Incorrect		
What does BLS stand for?	118 (94.4)	7 (5.6)	10.083	0.021*
BLS procedure in order	110 (88)	15 (12)	5.876	0.004**
When employing BLS during CPR, when should you check for a pulse?	103 (82.4)	22 (17.6)	7.809	0.000**
Compression position in adults for CPR	112 (89.6)	13 (10.4)	5.094	0.009**
Compression depth in adults	118 (94.4)	7 (5.6)	7.603	0.008**
CPR compression position for children	120 (96)	5 (4)	8.963	0.023*
Child compression depth	114 (91.2)	11 (8.8)	6.021	0.004**
CPR compression position for newborns	117 (93.6)	20 (16)	2.096	0.001**
Newborn compression depth	99 (79.2)	8 (6.4)	10.001	0.033*
When you started the dental procedure, the patient had syncope. What action would you take right away?	97 (77.6)	28 (22.4)	9.766	0.012**
What would you do if a patient's airway was blocked during dental procedures as they aspirated a foreign object?	105 (84)	20 (16)	3.186	0.028*
What will be your first line of treatment if you encounter an epileptic fit in the dental chair?	113 (90.4)	12 (9.6)	4.986	0.009**
What steps did you take in response to a patient experiencing cardiac arrest in a dental office?	99 (79.2)	26 (20.8)	6.991	0.006**
What will you do right away if you find out someone is not responding to you despite shaking and shouting at them?	117 (93.6)	8 (6.4)	9.850	0.015*
What maneuver should you employ to open airway?	116 (92.8)	9 (7.2)	8.753	0.006**
What should you do to ensure effective breathing?	95 (76)	30 (24)	4.569	0.031*
What should be the favorable position for patient who is nauseous and vomiting severely?	97 (77.6)	28 (22.4)	5.071	0.062

* $P \leq 0.05$ (significant), ** $P \leq 0.01$ (highly significant)

The response percentages to the questions about knowledge of Cardiopulmonary Resuscitation (CPR) are shown in **Table 2**. Majority of the surgeons (89.6%) correctly identified the surface on which to apply cardiac compression. Majority of the surgeons correctly answered the question about the compression depth for adults (94.4%), toddlers (91.2%), and newborns (79.2%). When questioned about the

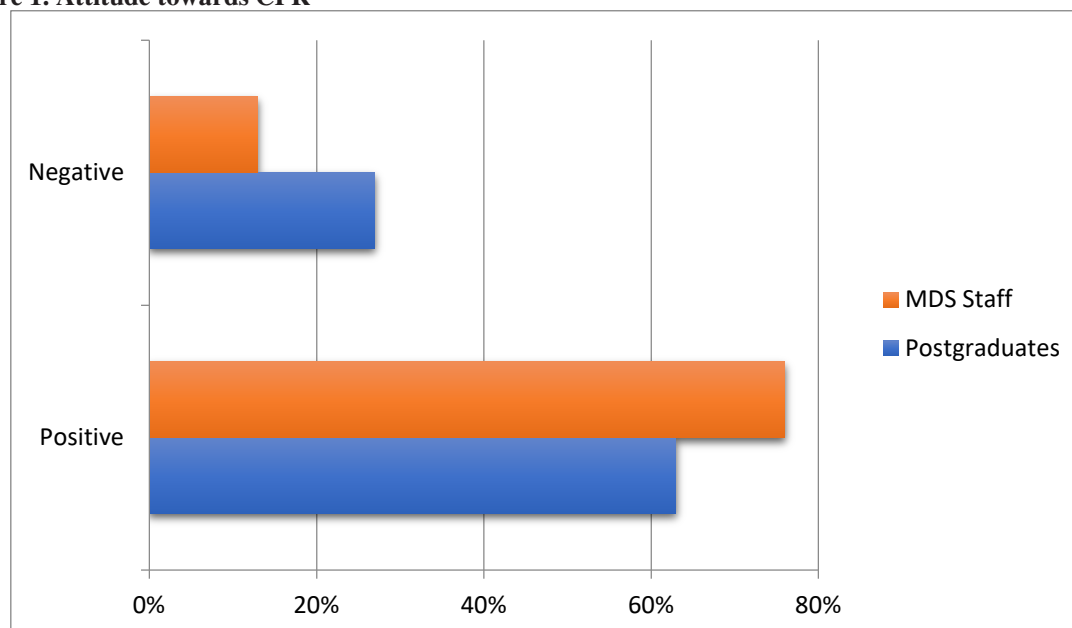
treatment of syncope and airway obstruction, 77.6% and 84% of respondents correctly responded. 90.4% and 79.2% of respondents, respectively, correctly answered questions about how to manage cardiac arrest and epilepsy. When asked how well they could conduct an airway opening maneuver and arrange a better position for a patient with nausea and severe vomiting, 92.8% and 77.6% correctly responded.

Table 3. Correlation Analysis

Variables	Pearson's correlation	p value
Knowledge and professional experience	0.913	0.006**
Knowledge and Attitude	0.401	0.008**
Years of experience and age	0.420	0.002**
Attitude and professional experience	0.391	0.005**

* $P \leq 0.05$ (significant), ** $P \leq 0.01$ (highly significant)

The relationships between age and work experience (years of employment), knowledge and attitude, and high professional experience and attitude are shown in **Table 3**. There was a high statistically significant correlation between each. Years of work experience and technical expertise were found to be correlated ($r = 0.913$), as were attitude and knowledge ($r = 0.401$). Work experience and attitude showed a correlation ($r = 0.391$). Additionally, age and experience showed a correlation ($r = 0.420$).

Figure 1. Attitude towards CPR

Of the 125 oral surgeons, 27% of postgraduates and 24% of MDS Staffs (25.5%) had a negative attitude towards CPR, while 63% of postgraduates and 76% of MDS Staffs (a total of 69.5%) had a good attitude. (**Figure 1**).

DISCUSSION

Life-threatening situations can happen at any time or place [6]. Cardiopulmonary arrest (CPA) can happen at any time in a dental chair [7]; however, few studies have shown CPA-related fatalities [8, 9]. Every dental clinic must have a sufficient emergency care plan [10]. A two- to three-fold higher survival rate is seen in patients who are revived right away after going into cardiac arrest [11]. Additionally, the survival rate would drop by 7–10% per minute if CPR was not started right away after a cardiac arrest [12]. According to our knowledge, this is the first study to be conducted in Kerala to evaluate OMFS surgeons' CPR expertise and knowledge. This study, which was done among Oral and Maxillofacial Surgeons, was driven by the fact that emergencies frequently occur in dental clinics during surgical procedures and extractions. Despite the fact that many dentists claim they have never encountered CPA, failing to adequately prepare for and handle such circumstances can have disastrous and legal repercussions. The current study assessed the personal experience and knowledge of oral and maxillofacial surgeons on CPR. In general, it was discovered that participants had above-average theoretical understanding, but only 60% of them were really able to execute CPR, which is analogous to Singh et al.'s work in 2011 (56%). [13] The current study's findings, on self-evaluation of CPR competence were consistent with those in the literature which showed an average just above 50% [14,15]. In our study, 69.6% of respondents received formal training in CPR, whereas in Iranian and Indian studies, none of the respondents had. [15, 16]. The majority of our participants correctly answered the question about CPR compression depth in adults, children, and neonates, which is similar to the research done by

Srinivasan K [17] among dental practitioners and demonstrates better knowledge when compared to the results by Chandrasekaran S [18] et al in India and Irfan B [19] et al in Pakistan. The higher awareness on BLS among the participants when compared to the existing literature may be due to the effective postgraduate training curriculum provided to the oral and maxillofacial surgeons on medical emergency management. Due to the absence of comparable studies among OMFS surgeons, comparisons were made on a broad scale. Years of work experience and professional expertise were found to be correlated ($r = 0.913$), as were attitude and knowledge ($r = 0.401$). Work experience and attitude showed a correlation ($r = 0.391$). Age and experience were shown to be correlated ($r = 0.420$). All of these results are consistent with those of Behroozi H [20] et al, who found that among Radiology Technologists, Age and work experience ($r = 0.866$, $P \leq 0.0001$), Age and technical knowledge ($r = 0.380$, $P \leq 0.0001$), work experience and technical knowledge ($r = 0.317$, $P \leq 0.003$), and attitude and technical knowledge ($r = 0.397$, $P \leq 0.0001$) all showed a correlation. We would want to stress that theoretical knowledge supported by demonstrations but lacking in application is probably insufficient to guarantee CPR proficiency. In contrast to findings by Narayan DPR [21] et al, who found that of the 100 postgraduate students, 52.0% had a favorable attitude and 48.0% had a negative attitude towards BLS, 69.5% of the 125 oral surgeons had a positive attitude and 27% had a negative attitude towards CPR in our current survey. The findings of this investigation agreed with those of research done by Roshana S et al [22] and Mersha AT et al in Ethiopia [23].

Emergency medicine is becoming more widely known, and The Medical Council of India has already recognised it as a distinct speciality [24]. The main duty of this new emergency speciality will be to raise awareness, instruct the medical and paramedical team in the fundamentals of advanced life support, and instruct the public in BLS and first aid [25]. Every member of the community needs to be knowledgeable about basic life support in order to save lives and enhance the level of public health. Future dentists especially oral and maxillofacial surgeons, who frequently deal with life-threatening circumstances, are expected to at least be fully aware of it. Their awareness and knowledge of BLS will be helpful to them.

STUDY LIMITATIONS

There are several limitations on this study. The results' generalizability may be constrained by the limited sample size. Additionally, assessing CPR proficiency solely on the basis of academic knowledge without practical experience is inadequate. It appears that for BLS skills, practical analysis is more accurate than a self-assessment questionnaire.

CLINICAL SIGNIFICANCE

Based on the study's findings, it is clear that continuing education requirements for OMFS surgeons in practise need to be raised, and that the dental office needs to be better organised to address crises of this nature.

CONCLUSION

According to the findings, the majority of participants were aware of how to address medical emergencies in dental practises, and senior surgeons had a higher level of awareness. Dental emergencies are common, even though the majority of them are not life-threatening. Improvements in emergency management proficiency should include regular attendance at life support training, course standardisation, and the provision of courses tailored specifically to dentists' needs. Dentists should brush up on emergency treatment procedures and arm themselves with treatment protocols. Workshops should regularly emphasise cardiac resuscitation techniques.

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ETHICAL APPROVAL

Before a respondent filled out the Google Form survey, the study was given the ethical review committee's approval and informed consent was obtained.

CONFLICTS OF INTEREST

There are no conflicts of interest, according to the authors.

REFERENCES

1. Singh A, Mishra PK, Das G, Shukla B, Singh P, Agarwal N. Review Of Basic Life Support For Adults: An Imperative Requisite For Dental Practitioners. *J Adv Med Dent ScieRes* 2015;3(4):68-73.
2. Kharsan V, Singh R, Madan R, Mahobia Y, Agarwal A. The Ability of Oral & Maxillofacial Surgeons to Perform Basic Life Resuscitation in Chattisgarh. *Journal of Clinical and Diagnostic Research*. 2015 Feb, Vol-9(2): ZC58-ZC60.
3. Wong CX, Brown A, Lau DH, et al. Epidemiology of Sudden Cardiac Death: Global and Regional Perspectives. *Heart Lung Circ* 2019;28(1):6-14. doi: 10.1016/j.hlc.2018.08.026.
4. American Red Cross. Responding to emergencies: comprehensive first aid/CPR/AED. 2017. United States of America: TheStayWell Company, LLC; 2017. Available from: <http://pchs.psd202.org/documents/mopsal/1539703875.pdf>. Accessed 18 February 2023.
5. Nolan JP, Soar J, Cariou A, Cronberg T, Moulart VR, Deakin CD, et al. European resuscitation council and European society of intensive care medicine 2015 guidelines for post-resuscitation care. *Intensive Care Med*. 2015;41(12):2039-56.
6. Brahm D. Death in the dentist's chair. *Lancet*. 1989;2:991-92.
7. Hunter PL. Cardiac arrest in the dental surgery. *Br Dent J* 1991;170:284.
8. Adewole RA, Sote EO, Oke DA, Agbelusi AG. An assessment of the competence and experience of dentists with the management of medical emergencies in a Nigerian teaching hospital. *Nig Q J Hosp Med*. 2009;19:190-94.
9. Fidler M, Galili D. Cardiac arrest in dental offices. Report of six cases]. *RefuatHapehVehashinayim* (1993). 2002 Jan;19(1):79-87, 103. Hebrew.
10. Lipp M, Kubota Y, Malamed SF, Matsuura H, Sykes P. Management of an emergency: to be prepared for the unwanted event. *Anesth Pain Control Dent*. 1992 Spring;1(2):90-102.
11. Fredriksson M, Herlitz J, Nichol G. Variation in outcome in studies of out of- hospital cardiac arrest: a review of studies conforming to the Utstein guidelines. *Am J Emerg Med*. 2003;21:276-81.
12. Handley AJ, Koster R, Monsieurs K, Perkins GD, Davies S, Bossaert L. European Resuscitation Council Guidelines for Resuscitation 2005: Section 2. Adult basic life support and use of automated external defibrillators. *Resuscitation*. 2010;81:1277-92.
13. Singh K, Bhat N, Ramesh N, et al. Cardiopulmonary resuscitation: Knowledge and personal experience among dentists in Udaipur, India. *J Dent Sci* 2011;6:72-75.
14. Champman PJ. Medical emergencies in dental practice and choice of emergency drugs and equipment: A survey of Australian dentists. *Aust Dent J*. 1997;42(2):103-8.
15. Kavari SH, Chohedri AH. Cardiopulmonary resuscitation: knowledge and personal experience in Iranian dentists. *Pak J Med Sci*. 2007;23(2):296-7.
16. Baduni N, Prakash P, Srivastava D, Sanwal MK, Singh BP. Awareness of basic life support among dental practitioners. *Natl J Maxillofac Surg* 2014;5:19-22.
17. Srinivasan K. Cardiopulmonary Resuscitation Knowledge among Dental Students: A Questionnaire Study. *Saudi J Oral Dent Res*. 2019; April 2019; 4(4): 226-232. DOI:10.21276/sjodr.2019.4.4.6.

18. Chandrasekaran S, Kumar S, Bhat SA, Saravanakumar, Shabbir PM, Chandrasekaran VP. Awareness of basic lifesupport among medical, dental, nursing students and doctors. *Indian J Anaesth* 2010;54:121-6.
19. Irfan B, Zahid I, Khan MS, Khan OAA, Zaidi S, Awan S, Bilal S, Irfan O. Current state of knowledge of basic life support in health professionals of the largest city in Pakistan: a cross-sectional study. *BMC Health Serv Res.* 2019 Nov 21;19(1):865. doi: 10.1186/s12913-019-4676-y.
20. Behroozi H, Alboghbeish M, Khalafi A, Azizi A, Tahmasebi M, et al. Knowledge and Attitude of Radiology Technologists Towards Cardiopulmonary Resuscitation. *Jundishapur J Health Sci.* 2015;7(2):e27996. [https://doi.org/10.5812/jjhs.7\(2\)2015.27996](https://doi.org/10.5812/jjhs.7(2)2015.27996).
21. Narayan DPR, Biradar SV, Reddy MT, Sujatha BK. Assessment of knowledge and attitude about basic life support among dental interns and postgraduate students in Bangalore city, India [J]. *World Journal of Emergency Medicine*, 2015, 6(2): 118-122.
22. Roshana S, Batajoo KH, Piryani RM, Sharma MW. Basic life support: knowledge and attitude of medical/paramedical professionals. *World J Emerg Med.* 2012;3:141-145.
23. Mersha AT, Gebre, Egzi AHK, Tawuye HY, et al. Factors associated with knowledge and attitude towards adult cardiopulmonary resuscitation among healthcare professionals at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia: an institutional-based cross-sectional study. *BMJ Open* 2020;10:e037416. doi:10.1136/bmjopen-2020-037416
24. Davey K, Blanchard J, Douglass K, Verma A, Jaiswal S, Sheikh W, Halder M, Palta K, Jena NN, Poovathumparambil V, Nomani S, Gidwani S. Emergency medicine in India: Time for more than applause. *Acad Emerg Med.* 2021 May;28(5):600-602. doi: 10.1111/acem.14244.
25. Kshirsagar AY, Biradar S, Nagur B, Reddy M, Savsaviya J, Panicker S. Knowledge of Basic Life Support among the Nursing Staff and Students of KIMS DU. *Ann. Int. Med. Den. Res.* 2016;2(1):243-47.