

# Basic Life Support Knowledge, Awareness, and Attitude among Dental Students in Davangere City, Karnataka, India: A Cross-sectional Study

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## ABSTRACT

**Introduction:** According to the World Health Organization, heart disease is the world's largest killer claiming 17.5 million lives every year. Every 29 seconds, an Indian dies of heart problem. It is important that every member of our community including dental practitioners be trained in high-quality cardiopulmonary resuscitation (CPR) as it is a basic medical skill, which can save many lives if implemented timely.

**Aim:** The aim of the study was to determine basic life support (BLS) knowledge, awareness, and attitude among clinical dental students (III and IV year students), interns, and post-graduate students in the dental colleges of Davangere city, Karnataka, India.

**Materials and methods:** A cross-sectional study was conducted by using a close-ended, validated questionnaire comprising 17 questions pertaining to demographic details, knowledge, awareness, and attitude toward BLS among clinical dental students in Davangere city. Descriptive, chi-squared test and Logistic regression were used to analyze the data using Statistical Package for the Social Sciences version 20.

**Results:** After excluding the incomplete response forms, the data were analyzed for 495 responders with a response rate of 96.6%. In the present study, only 23.2% of the responders answered that the rate of chest compression is 100/minute in adults and children and 62.2% of the students were not aware of Heimlich maneuver. About 68.5% students had not attended previous BLS workshops.

**Conclusion:** The present study highlights that the overall knowledge, awareness, and attitude among dental students regarding BLS is not satisfactory in Davangere. This study emphasizes the fact that undergraduate course in dentistry must be regularly updated on the knowledge and skills regarding BLS along with practical courses.

**Keywords:** Basic life support, Cross-sectional study, Dental students.

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## INTRODUCTION

The life of an individual is influenced by various factors like health, education, occupation, and socioeconomic status. Among these factors, health influences the life of an individual to a great extent. There are systemic conditions like myocardial infarction, congestive cardiac failure, and stroke, which may cause death of an individual.<sup>1</sup> According to the World Health Organization, cardiac diseases are the world's largest killer claiming 17.5 million lives every year. Every 29 seconds a person dies in India due to cardiac problem. As many as 20,000 new people develop heart disease every day. In India, 90 million suffer from heart disease and more than 30% are at high risk of sudden cardiac arrest (SCA).<sup>2</sup>

There are different ways by which the occurrence of death of an individual due to cardiac problems may be prevented. They include the instructions given and medications prescribed by health professionals, diet, and physical exercises. In addition to these ways, BLS in case of medical emergencies is most important. The BLS is the provision of treatment designed to maintain adequate circulation and ventilation to the patient in cardiac arrest, without the use of drugs. It includes recognition of signs of SCA, heart attack, stroke and foreign body airway obstruction, and skills of CPR and defibrillation with an automated external defibrillator.<sup>3-6</sup>

The BLS is a core skill in which all health care professionals should be proficient. As health care professionals, dental practitioners also encounter life-threatening medical emergencies in routine practice.<sup>7</sup> Fear and anxiety within the confines of the dental office due to increased level of stress often may make these patients prone to medical emergencies. Effective management of an emergency situation in the dental office is ultimately the dentist's responsibility.<sup>7</sup> It is logical to provide BLS training during undergraduate years ensuring basic competence in all graduating health care students.<sup>8</sup> The literature is limited in regard to the BLS knowledge among dental students in Davangere city, Karnataka, India. With this background, the present study was undertaken to assess

the knowledge, awareness, and attitude of BLS among undergraduate clinical (III year, IV year, interns) and postgraduate dental students in Davangere city.

**MATERIALS AND METHODS**

The present study was a questionnaire-based survey, consisting of 17 questions pertaining to the knowledge, awareness, and attitude toward BLS among dental students in Davangere.

The study was conducted from February to March 2016. The protocol was approved by the Institutional Review Board of College of Dental Sciences with Ref. No. CODS/1015/2016-2017.

All clinical and postgraduate students of two dental colleges in Davangere, who were present on the day of distribution of questionnaire, were included in the study.

Questionnaire was administered to a sample of 15 students attending public health dentistry clinical posting who were interviewed to gain feedback on the overall acceptability, validity, and reliability of the questionnaire in terms of length, language clarity, time, and feasibility of students completing and returning it. Based on the opinions expressed, a mean content validity ratio of 0.85 was found. After obtaining the consent from each participant, the questionnaire was self-administered by single investigator. Each one was asked to fill the provided questionnaire in front of the investigator with adequate time to avoid any malpractice while answering. Confidentiality was maintained throughout the process. Incomplete response sheets were excluded from data capturing and analysis.

The structured questionnaire consisted of three sections:

1. Demographic data and professional qualification: (name, gender, age, academic level).
2. Knowledge of participants related to BLS (nine close-ended questions).

3. Awareness and attitude toward BLS (eight close-ended questions).

The answer keys for the core questions on knowledge of BLS were generated using the BLS manual from the American Heart Association.<sup>9</sup>

**DATA PROCESSING AND ANALYSIS**

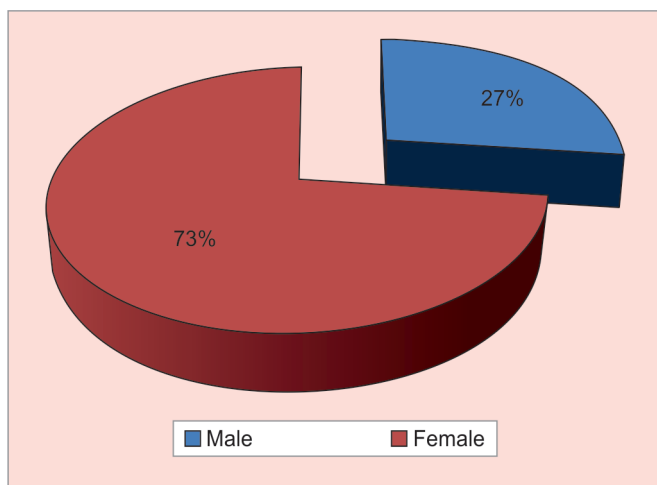
The data from 495 clinical dental students so obtained were entered in Excel sheet, and descriptive and inferential statistical analysis was made. Statistical Package for Social Sciences software version 20.0 was used for data analysis.

The chi-squared test was used to test associations between the responses among the age, genders, qualification, and academic year. Binominal logistic regression analysis was done to compare the knowledge of undergraduates and postgraduates whereas multinominal logistic regression analysis was done to compare the knowledge of IV year students, interns, and postgraduates with reference to III year students. A critical p-value of 0.05 was regarded as significant.

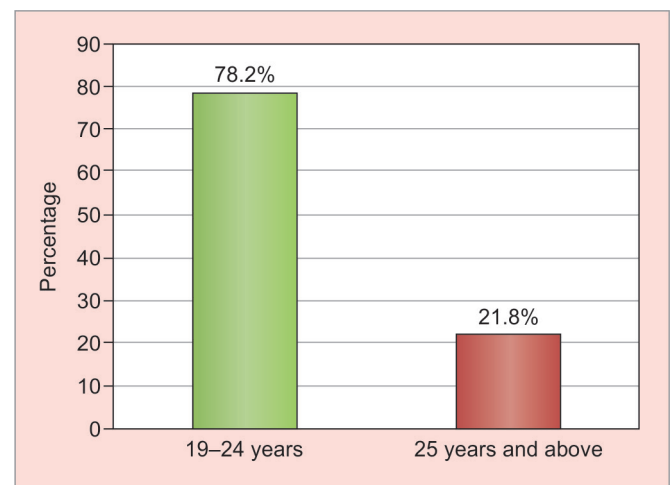
**RESULTS**

A total of 512 questionnaires were distributed of which 495 were returned, with a response rate of 96.39%. Out of the 495 participants, 73.1% were females (Graph 1). About 78.2% students were in the age group between 19 and 24 years (Graph 2). The sample consisted of four groups according to the different academic levels: III year Bachelor of Dental Surgery (BDS; 30.5%), IV year BDS (29.5%), interns (21%), and postgraduates (19%; Graph 3). About 19% of the students were pursuing Master of Dental Surgery (MDS) and majority (81%) were pursuing BDS in the present study (Graph 4).

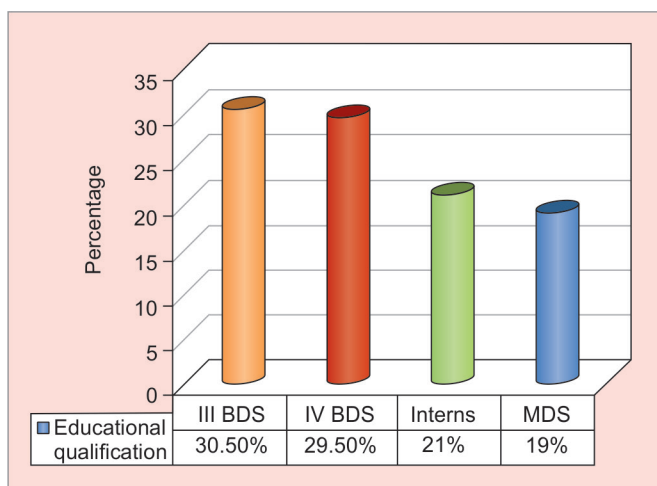
Table 1 describes the chi square results for the significant responses with respect to age, gender, academic levels, and educational qualification.



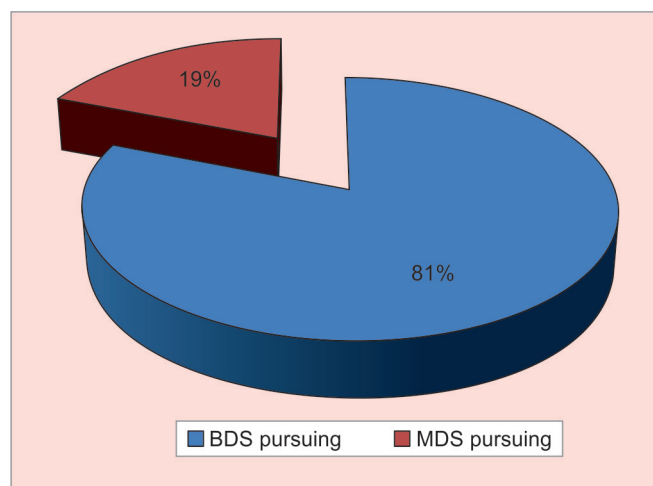
**Graph 1:** Percentage distribution of students based on their gender



**Graph 2:** Percentage distribution of students based on their age



**Graph 3:** Percentage distribution of students based on their academic level



**Graph 4:** Percentage distribution of students based on their educational qualification

**Table 1:** Analysis of responses to knowledge, awareness, and attitude-based questions among students

Questions	Responses	n	%	Significance
When you find someone unresponsive in the middle of the road, what will be your immediate action?	(1) Open airway	287	58	0.000 <sup>b</sup> (age, class, education)
	(2) Start chest compression	113	22.8	
	(3) Activate EMS	81	16.4	
	(4) Give two breathings	14	2.8	
What is the location of chest compression in CPR?	(1) Left side of the chest	168	33.9	0.000 <sup>b</sup> (age, class, education)
	(2) Right side of the chest	27	5.5	
	(3) Mid chest	222	44.8	
	(4) Xiphisternum	78	15.8	
Indicate the number of chest compressions to be done in adult during CPR?	(1) 30/min	199	40.2	0.000 <sup>b</sup> (age, class) 0.002 <sup>b</sup> (education)
	(2) 50/min	120	24.2	
	(3) 80/min	61	12.3	
	(4) 100/min	115	23.2	
Which maneuver can be used to open the airway?	(1) Sweep finger in mouth	49	9.9	0.000 <sup>b</sup> (age, class, education)
	(2) Head tilt-chin lift	332	67.1	
	(3) Chin tilt-head lift	69	13.9	
	(4) Chest compression method	45	9.1	
Have you heard of Heimlich maneuver?	(1) Yes	187	37.8	0.000 <sup>b</sup> (age, class, education)
	(2) No	308	62.2	
Check for pulse no more than _____ in medical emergency	(1) 5 sec	78	15.8	0.000 <sup>b</sup> (age, class, education)
	(2) 10 sec	206	41.6	
	(3) 15 sec	172	34.7	
	(4) 20 sec	39	7.9	
Have you ever seen a BLS being done?	(1) Yes	36	7.3	0.000 <sup>b</sup> (age, class, education)
	(2) No	459	92.7	
If yes, have you ever done a BLS?	(1) Yes	36	7.3	0.000 <sup>b</sup> (age, class, education)
	(2) No	459	92.7	
If no, reason for reluctance?	(1) Fear of causing further harm to patient	149	30.1	0.000 <sup>b</sup> (age, class, education)
	(2) Fear of being punished by law	22	4.4	
	(3) Fear of taking responsibilities	34	6.9	
	(4) Not aware of procedure	254	51.3	
	(5) Yes	36	7.3	
The last attended BLS workshop?	Within last 5 years	114	23	0.000 <sup>b</sup> (age, class, education)
	More than 5 years	42	8.5	
	Never attended	339	68.5	

$\chi^2$  = Chi-square test, <sup>a</sup>p≤0.05 significant, <sup>b</sup>p≤0.01 highly significant

**Table 2:** Binominal logistic analysis of responses among the participants with different educational qualification

Questions	Education	Regression		Odds ratio	95% confidence interval	
		coefficient	p-value		Lower	Upper
When you find someone unresponsive in the middle of the road, what will be your immediate action?	BDS	1.268	0.000 <sup>b</sup>	0.144	1.030	1.507
	MDS	0.313	0.001 <sup>b</sup>	0.144	0.122	0.503
What is the location of chest compression in CPR?	BDS	1.563	0.000 <sup>b</sup>	0.255	1.259	1.867
	MDS	0.724	0.000 <sup>b</sup>	0.255	0.481	0.967
Indicate the number of chest compressions to be done in adult during CPR	BDS	1.678	0.000 <sup>b</sup>	0.141	1.344	2.011
	MDS	0.427	0.002 <sup>b</sup>	0.141	0.161	0.693
Which maneuver can be used to open the airway?	BDS	2.455	0.000 <sup>b</sup>	0.103	2.246	2.664
	MDS	0.196	0.022 <sup>b</sup>	0.103	0.362	0.029
Have you heard of Heimlich maneuver?	BDS	2.37	0.000 <sup>b</sup>	0.473	2.197	2.438
	MDS	0.584	0.000 <sup>b</sup>	0.473	0.681	0.488
Check for pulse no more than _____ in medical emergency	BDS	2.733	0.000 <sup>b</sup>	0.152	2.499	2.967
	MDS	0.324	0.001 <sup>b</sup>	0.152	0.510	0.137
Have you ever seen a BLS being done?	BDS	2.122	0.000 <sup>b</sup>	0.306	1.998	2.246
	MDS	0.359	0.000 <sup>b</sup>	0.306	0.458	0.260
The last attended BLS workshop?	BDS	3.153	0.000 <sup>b</sup>	0.274	2.925	3.382
	MDS	0.587	0.000 <sup>b</sup>	0.274	0.770	0.405

<sup>a</sup>p ≤ 0.05 significant, <sup>b</sup>p ≤ 0.01 highly significant

More than half of students in the present study said that they will immediately open the airway if they find someone unresponsive in the middle of the road. According to 44.8% of students, the location for chest compression in CPR is midchest. According to 40.2% students, the number of chest compression to be done in adult during CPR is 30/min. Majority (67.1%) in the present study said that they will do head tilt-chin lift maneuver to open the airway and majority of them had heard about Heimlich maneuver; 68.5% of students have never attended a BLS workshop. About 92.7% had not seen a BLS being done.

Tables 2 and 3 depict the regression values of the responses based on the qualification and academic level.

## DISCUSSION

The BLS is a simple life-saving protocol following a medical emergency. It is an integral part of emergency resuscitative care that aims to retain sufficient ventilation and circulation until the cause of the arrest is detected and eliminated. The medical emergencies are not rare in dental practice, as about two-thirds of dentists faced at least one emergency during the 12-month study period.<sup>7</sup> Dentistry is a health profession that should provide complete medical care and treat the whole patient rather than focusing on the oral cavity. In India, the undergraduate curriculum as proposed by the Dental Council of India includes medical emergency management under the subjects of general medicine and oral and maxillofacial surgery.<sup>10</sup> Keeping this in mind, only III and IV years (clinical dental students), and interns along with post-graduate students of both the dental colleges in Davangere were included in the study.

In a study by Alotaibi et al,<sup>7</sup> dental students and staff in King Saud University reported that almost all the participants (99.1%) had attended previous BLS workshops, whereas the present study showed that most of the participants (68.5%) had not attended previous BLS workshops. Around 92.7% participants have not seen and not been involved in any patient resuscitation experience. On the contrary, in a study conducted by Gupta T et al<sup>11</sup> on dentists of Udupi and Mangalore in India, majority of participating dentists recalled having received training in management of medical emergencies as undergraduates. The reasons for this variation could be lack of BLS workshops in their surroundings.

In the present study, a large number of the respondents (51.3%) were reluctant to perform CPR to a stranger because they are not aware of the procedure and about one-third of them (30.1%) indicated that the reason for reluctance is being afraid of causing further harm to the patient, which is comparable to the responses of participants in a study by Alotaibi et al.<sup>7</sup>

Only 23.2% of the responders answered the rate of chest compression as 100/minute in adults and children in the present study when compared with 35% of the responders in a study by Chandrasekaran et al,<sup>12</sup> with the study group comprising medical, dental, nursing students, and faculty in a city in Tamil Nadu. More than half of the participants (55.2%) did not know that the right location of chest compression is the midchest in the present study, whereas 74% participants did not know the correct location of chest compression in a study by Chandrasekaran et al.<sup>12</sup> The present study results demonstrated that 83.6% participants were not aware about



**Table 3:** Multinomial logistic analysis of responses among the participants with different academic levels

Questions	Academic level	p-value	Odds ratio	95% confidence interval	
				Lower	Upper
When you find someone unresponsive in the middle of the road what will be your immediate action?	III year	Reference	Reference	Reference	Reference
	IV year	0.000 <sup>b</sup>	1.344	1.440	6.102
	Interns	0.271	0.245	0.097	0.433
	MDS	0.000 <sup>b</sup>	21.12	3.245	4.420
What is the location of chest compression in CPR?	III year	Reference	Reference	Reference	Reference
	IV year	0.006 <sup>b</sup>	2.079	0.428	10.003
	Interns	0.001 <sup>b</sup>	0.941	0.211	0.823
	MDS	0.009 <sup>b</sup>	0.783	0.056	0.283
Indicate the number of chest compressions to be done in adult during CPR	III year	Reference	Reference	Reference	Reference
	IV year	0.006 <sup>b</sup>	0.901	0.901	3.885
	Interns	0.024 <sup>a</sup>	0.693	0.109	0.651
	MDS	0.901	0.031	0.050	0.271
Which maneuver can be used to open the airway?	III year	Reference	Reference	Reference	Reference
	IV year	0.000 <sup>b</sup>	3.761	0.029	0.580
	Interns	0.423	0.693	0.136	5.113
	MDS	1.000	0.000	0.238	14.614
Check for pulse no more than _____ in medical emergency	III year	Reference	Reference	Reference	Reference
	IV year	0.000 <sup>b</sup>	1.210	0.624	3.138
	Interns	0.591	0.194	2.523	15.990
	MDS	0.028 <sup>a</sup>	1.041	0.556	6.918
The reason for lack of knowledge about BLS	III year	Reference	Reference	Reference	Reference
	IV year	0.000 <sup>b</sup>	2.639	0.460	7.327
	Interns	0.000 <sup>b</sup>	1.173	0.422	2.153
	MDS	0.497	0.154	0.695	2.157
The last attended BLS workshop	III year	Reference	Reference	Reference	Reference
	IV year	0.000 <sup>b</sup>	0.049	0.025	0.131
	Interns	0.000 <sup>b</sup>	1.204	0.088	0.569
	MDS	0.002 <sup>b</sup>	1.497	0.250	1.280

<sup>a</sup>p ≤ 0.05 significant, <sup>b</sup>p ≤ 0.01 highly significant

the immediate action to be taken if they found someone unresponsive in the middle of the road, whereas 89% failed to insist on activating EMS immediately after confirming the unresponsiveness in an adult in a study by Chandrasekaran et al.<sup>12</sup> The reasons for this could be multifactorial, either their lack of basic knowledge of BLS or ignorance or lack of confidence in answering this question. The present study revealed that 62.2% of the participants were not aware of Heimlich maneuver. Most of the participants in the present study (67.1%) responded that they will do head tilt–chin lift maneuver to open the airway, whereas in a study by Baduni et al<sup>13</sup> only one responder knew that airway in a victim of trauma on road traffic accident should be maintained by jaw thrust. The reasons for this could be increased awareness toward BLS skills.

In the present study, it was noted that IV year undergraduate clinical students had better knowledge and awareness compared with III year, interns, and postgraduate students of both the dental colleges (Table 3). This could be attributed to the fact that IV year students attended general medicine and surgery clinics in their

previous academic year and the subject of oral and maxillofacial surgery is integrated in the IV year. The present study also highlights that the overall knowledge and awareness among BDS and MDS students is not satisfactory.

### STRENGTH AND LIMITATIONS

The present study included both theoretical and practical-based questions but the study was confined to two dental colleges in Davangere city, so generalization of results cannot be done.

Practical skills of BLS could not be assessed in the study.

### CONCLUSION

Taken altogether, the present study demonstrated that there is a significant lack of knowledge, awareness, and attitude among postgraduate students compared with undergraduate students regarding BLS. This study emphasizes the fact that undergraduate courses in dentistry must be revised or regularly updated on the

knowledge and skills regarding BLS along with practical courses.

## RECOMMENDATIONS

- This study should be carried out in various other medical, dental, and paramedical institutions and the knowledge, awareness, and attitude toward BLS among the students and faculty should be assessed.
- The participation of educational institutions to improve the training of students and professionals for CPR and other medical emergencies that can occur in the dental office is necessary.

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