



## Original Article

## Assessment of Basic Life Support Knowledge among Dental Surgeons: A Descriptive Cross-Sectional Study

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## ABSTRACT

This study was carried out to evaluate the knowledge and aptitude of dental surgeons regarding Basic life support in case of medical emergencies. **Objective:** To evaluate knowledge of BLS among dental surgeons and to see if they have adequate training to tackle medical emergencies on a dental chair. **Methods:** A structured pre validated questionnaire based study was conducted among dentists working in teaching hospitals of Islamabad. Participants were asked to fill in a Performa which consisted of 17 questions. A score of 1 was given in case of correct answer and 0 in case of incorrect response to all the participants. The data analysis was done using SPSS (23.0) and ANOVA test applied to the variables. **Results:** Age and Years of experience showed considerable difference of the knowledge with a p value of <0.05. The highest score recorded was only 14 by only 1 of the participants (0.3%). 68 out of 370 participants (almost 18.4%) scored 7 out of 17. The most correct question with 65% of positive rate was management of patient undergoing syncope on a dental chair. Out of all the 370 participants, less than 50% knowledge in 290 participants and greater than 50% knowledge was found in only 80 participants. **Conclusions:** This study showed limited knowledge of BLS amid practicing dental surgeons henceforth the dire need for continuous training on BLS..

## INTRODUCTION

Medical emergencies are not very common in dental setups nonetheless an apparent rise is seen in current practice worldwide [1]. Therefore, dental surgeons are required to have expertise over the dental treatment as well as on how to cope with such situations when time occurs and medical assistance is not readily offered [2]. Earlier literature shows that during their working years almost all the dentists have encountered such medical emergencies which can range from the very common ones like vasovagal syncope and anaphylaxis to less common but more severe ones like cardiac arrests or angina pectoris [3]. The number of medical emergencies is seen to rise gradually

due to more knowledge and concern of elderly patients towards their oral care and hygiene. Increase in age increases the frequency of emergencies in dental setting during or even after the procedure is done [1]. Other common causes include anxiety, apprehension and white coat fear [1, 4]. Cardiac arrest is known to have high mortality rate but given much less importance when compared to other cardiovascular disorders like myocardial infarction and stroke etc. The most common cause of cardiac arrest is cardiac (50-60%) which is then followed by respiratory (15-40%) causes [5]. Previous study shows that every dentist will encounter a medical

emergency in their practice and on average every one in seven dentists will witness cardiac arrest and perform resuscitation on the patient [6]. Worldwide dentist are not fully trained to deal with such medical emergencies and are incapable of responding readily to such settings, henceforth most dental schools incorporate medical emergencies dealing in their courses, which need to be revised, time to time, for better dealing of such conditions when they occur in dental settings [2, 7]. Basic Life Support is the basic knowledge of preserving the airway and breathing and keeping the patient alive until and unless trained medical personnel arrive. It plays a huge role in saving lives and is a must to do training programme in most if not all the dental schools present all over the world [8, 9]. Likewise operating Automated External Defibrillator is essential and increases the chances of survival in such patients [10]. To guarantee the wellbeing of dental patients and increasing the survival rate in such situations require continuous training programme of Basic Life Support (BLS) and Cardiopulmonary Resuscitation (CPR) among all the working dentists [11]. There are few previous studies showing the need for BLS training programmes among dental surgeons and the knowledge they have while working in the field. This cross sectional study is carried out to evaluate the knowledge concerning BLS among dentists in the Capital.

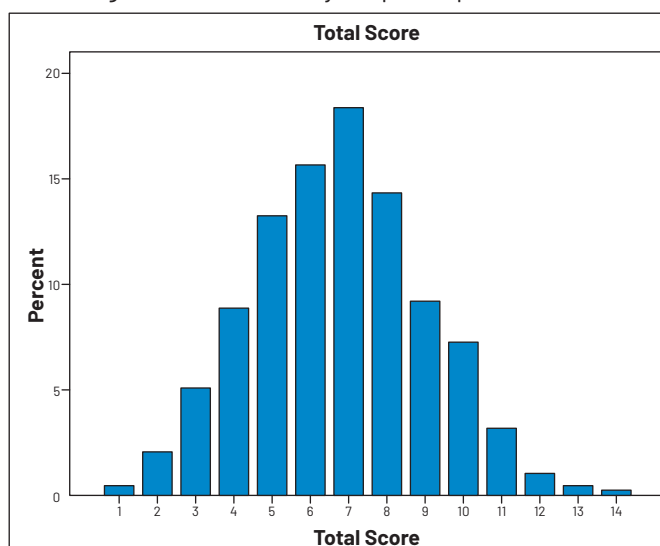
## METHODS

It was a Descriptive Cross-Sectional Study. Convenience sampling was performed. Inclusion criteria was age between 20–60 years, both genders and dentists currently working in teaching hospitals. Exclusion Criteria was students, and not currently working dentists. Sample Size of 370 was taken, calculated by WHO calculator, with a confidence interval of 95%, margin of error 5%, Population proportion 50%, and population size of 10,000. Following Ethical Approval from the Ethical Committee of the hospital, this research was led. Verbal consent was taken from all the working dentists. Participants were informed of the objective of the study. A structured pre-validated questionnaire was used and the participants were asked to fill in. Practicing dentists from teaching hospitals of Islamabad were included in the study. All the data were kept anonymous. The study was performed according to the guidelines of Declaration of Helsinki 2013 [12, 13]. The pre-structured validated Performa was used and on each correct response a score of 1 is given and none in case of incorrect option, to all the participants [14]. 17 questions were in the questionnaire including demographics and knowledge regarding BLS. The data were analyzed via SPSS version 23.0 and ANOVA test applied to the variables like age, educational level and years of experience. Mean,

percentages and standard deviation was used to describe descriptive statistics.

## RESULTS

The questionnaire was given in printed form to 400 dentists working currently in the teaching hospitals of Islamabad. Out of the 400, only 370 responded, giving the response rate of 94%. ANOVA was applied to variables like age groups, and educational level. Figure 1 shows total knowledge score obtained by the participants.



**Figure 1:** Total score obtained by the participants (in percentages) (n=370)

The difference between Males and female's knowledge on BLS was statistically insignificant with p-value > 0.05, whereas age (in years) and years of experience of dental surgeons showed considerable difference of the knowledge regarding basic life support and management of medical emergencies with a p-value of <0.05. Participants with more years of practice (senior faculty + Post Graduate trainees) scored greater than the participants with less years of experience i.e. only BDS but the difference was statistically insignificant with p-value of >0.05 (Table 1).

**Table 1:** Participants demographics and Mean Scores (n=370)

Variable	Category	Mean score	p-value
Gender	Male	6.73 ± 2.29	0.986
	Female	6.75 ± 2.30	
Age (in years)	20-25	6.31 ± 2.24	0.001
	25-30	6.93 ± 2.32	
	30-35	7.45 ± 2.21	
	35-40	8.89 ± 1.2	
Educational Level	BDS	6.69 ± 2.32	0.67
	PG Trainee	6.67 ± 2.29	
	Senior Faculty	7.54 ± 2.08	
Years of experience	< 5	6.45 ± 2.21	0.002
	5-10	7.28 ± 2.54	
	10-15	7.90 ± 1.34	
	15-20	7.00 ± 2.37	

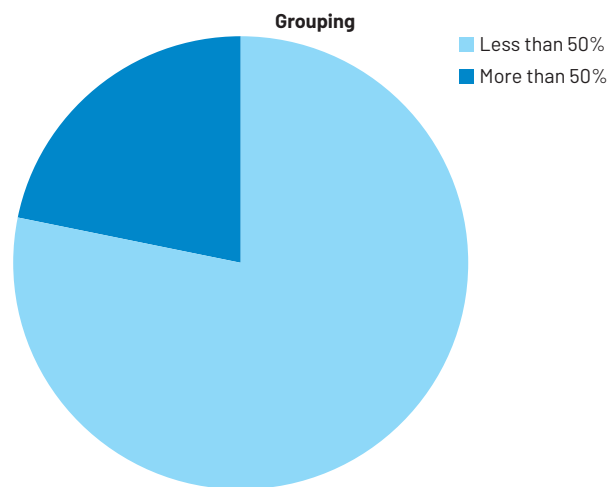
Out of a total of 17 questions, the highest score recorded was only 14 by only 1 of the participants (0.3%). Majority of the participants, 68 out of 370 participants (almost 18.4%) scored 7 out of 17.

Response rate regarding knowledge of the dentists on BLS is depicted in Table 2. Out of 370 respondents only 30(8.1%) knew the right order of events laid by AHA guidelines 2015 for cardiopulmonary resuscitation in an adult with a single savior as C-A-B (chest compressions, airway and breathing). Only 145 participants, which make 39.2% of the sample size knew the exact steps in case of basic life support management. Two thirty-seven respondents (64.1%) respondents were aware of the number of chest compressions followed by breathing given in CPR with a single rescuer. The most correct question with 65% of positive rate was management of patient undergoing syncope on a dental chair.

**Table 2:** Response of participants towards questions regarding basic life support (n=370)[14]

Questions on basic life support	Correct answer	Correct response (%)
The preliminary Basic Life Support (BLS) steps in adults are:	Assess the victim, activate Emergency services and get an AED, check pulse and start CPR	145(39.2%)
The AHA Guidelines (2015) for CPR recommended BLS sequence of steps in case of single rescuer:	Chest compressions, Airway, Breathing	30(8.1%)
Correct position of chest compression during CPR?	Center of the chest	192(51.9%)
Ratio of Chest compressions and breathing given in CPR?	30 chest compressions and 2 rescue breaths	237(64.1%)
A patient suffered from syncope on your dental chair. What would your immediate action be?	Place the patient in Trendelenberg position	241(65.1%)
Depth of Chest compressions in adults	>2 inches	128 (34.6%)
In case of foreign body aspiration, what would you do?	Attempt Heimlich maneuver	225(60.8%)
In case of seizure attack on a dental chair, your plan of action would be?	Make the patient lie on the lateral position	211(57%)
Drug of choice for angina patient with history of heart attack	Glyceryl Trinitrate (sublingually)	247(66.8%)
Drug of choice in case of anaphylaxis	IM Adrenaline	217(58.6%)
Which of the following drug(s) is/are used during Basic Life Support?	Adrenaline	322(87%)
	Diazepam	186(50.3%)
	Glyceryl Trinitrate	187(50.5%)
	Insulin	69(18.6%)
	Amiodarone	23(6.2%)
	Magnesium	18(4.9%)
	Bicarbonate	28(7.6%)

Out of all the 370 participants of the study, less than 50% knowledge in 290 participants and greater than 50% knowledge was found in only 80 participants (Figure 2).



**Figure 2:** Percentage of participants with below 50% knowledge regarding Basic life support (n=370)

## DISCUSSION

Medical emergencies posing threat to life can occur anywhere or at any time, the most important being sudden cardiac arrest. There is previous information showing cardiac arrest and its high mortality rates in hospital setting [5]. So lack of competency and training in BLS can have serious consequences [15]. In this study, the dentists showed below average level of knowledge of BLS in the present study which is in line with the results of the previous surveys done on dentists [16]. This study displayed a minute difference in the mean knowledge score between male ( $6.73 \pm 2.29$ ) and female ( $6.75 \pm 2.30$ ) with statistically insignificant difference. However another study conducted in India to assess the knowledge of BLS in oral surgeons showed a statistically significant difference between Males and female's knowledge on BLS with a p-value ( $p < 0.001$ ) [17]. About one tenth of the dentists were aware of the correct sequence of BLS (8.1%) in case of one rescuer which was much lower than the findings of Keshwar *et al.*, (49.3%) [14]. Only 51.9% participants were familiar with the correct site of chest compression during CPR which was in accordance with the finding of Keshwar *et al.*, (46.6%) but lower than the finding of Al-Shamiri *et al.*, (56%) [14, 18]. About one third of our participants (34.6%) knew the depth of the chest compression in case of adults while doing CPR which was greater than the previous studies carried out [18]. About two third of the respondents knew the ratio of chest compression versus breathing done during resuscitation which was again higher compared to the findings of Baduni *et al.*, (36.54%). Seizure attack management was known by less than three fifth of the

participants [15]. In another survey conducted by Chandrasekaran *et al.*, 75.9% of the dentists have been taught regarding CPR and almost 56% were aware of performing it among a total sample of 241 dentists but only 12% of them actually gained practical experience regarding Basic Life support [16]. According to Arsati *et al.*, Brazilian dentists are not fully trained to manage medical emergencies despite frequent occurrence of life-threatening emergencies including anaphylaxis, cardiac arrest, Vasovagal syncope, and cerebrovascular accident [19]. However, in our study, not a single responder could answer all questions correctly. Medical emergencies are a common finding in dental setups which include clinics and hospitals. Inadequate training plus less knowledge on how to manage these emergencies lead to lethal consequences. Dentists should be competent enough to perform BLS in clinics otherwise these emergencies would lead to casualties [20]. Therefore, all dental surgeons should be up to date with the guideline to tackle with any kind of medical emergency.

## CONCLUSIONS

This study exhibits suboptimal knowledge among dental surgeons regarding BLS and showed the crucial need for refreshing courses which may be carried out in the form of seminars, lectures and workshops. Along with that the expertise related to BLS should also be assessed repeatedly and assessment exam be carried out at regular intervals to ensure patient safety in dental setups.

## Authors Contribution

Conceptualization: ZSR

Methodology: MF

Formal analysis: FM

Writing-review and editing: ZSR, MF, SAAH, IN

All authors have read and agreed to the published version of the manuscript.

## Conflicts of Interest

The authors declare no conflict of interest.

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