OPEN ACCESS
Saudi Journal of Oral and Dental Research
Abbreviated Key Title: Saudi J Oral Dent Res
ISSN 2518-1300 (Print) |ISSN 2518-1297 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: http://scholarsmepub.com/sjodr/

Original Research Article

Cardiopulmonary Resuscitation Knowledge among Dental Students: A Questionnaire Study

Dr. K. Srinivasan*
Reader, Department of Pedodontics and Preventive Dentistry, CKS Theja Institute of Dental Science and Research, Tirupati, India

***Corresponding author:** Dr. K. Srinivasan | **Received:** 09.04.2019 | **Accepted:** 18.04.2019 | **Published:** 30.04.2019
DOI:10.21276/sjodr.2019.4.4.6

Abstract

Background: Basic Life Support (BLS) / Cardiopulmonary Resuscitation (CPR) are an important part of emergency Medical care. ***Aims and objective:*** This study was done among Dental practitioners, to know their knowledge and perceptions about BLS, as they are going to face such situations in future, as Doctors. ***Materials and Methods:*** This is a cross-sectional study conducted among Dental Practitioners. The awareness about recent guidelines of American heart association (AHA), BLS, and factors associated which include Profession, gender, previous BLS training and updated with Highlights of 2015 were assessed by using a self-administered structured MCQ questionnaire. ***Statistical Analysis:*** The descriptive analysis was run to find the proportions of various parameters. Significant results were considered at 5% level of significance. ***Results:*** Our participants were aware of BLS, showed positive knowledge and attitude toward it, with the statistically significant *p* value.***Conclusion:*** By introducing BLS regularly in the Academic curriculum and by routine hands-on workshops, all the health-care providers should be well versed with the BLS skills for effectively managing the life threatening emergencies. Repeated training would increase their confidence.

Keywords: Basic life support/Cardiopulmonary Resuscitation; Questionnaire; Recent guidelines; Knowledge; Attitude; Awareness.

INTRODUCTION

Basic Life Support (BLS) includes recognition of signs of Sudden Cardiac Arrest (SCA), heart attack, stroke and Foreign-Body airway Obstruction (FBAO); Cardiopulmonary resuscitation (CPR); and defibrillation with an Automated External Defibrillator (AED) [1].

It is very important that every person in the community know about Basic Life Support to save lives and improve the quality of community health. At least the doctors, nursing and paramedical staff are expected to know about it, as they are frequently facing life threatening situations and the knowledge of BLS will be definitely useful. In this study we wanted to investigate the awareness of Basic Life Support among various health sector persons [2].

The life of an individual is influenced by various factors like health, education, occupation and socioeconomic status. There are systemic conditions like Myocardial Infarction, Congestive Cardiac Failure and Stroke which cause the death of the individual [3].

There are different ways by which the occurrence of the death of an individual due to cardiac problems may be prevented, one of which is by skills of CPR [4].

Basic life support (BLS) is defined as Medical procedures that can be applied in the case of an emergency to save lives. It is provided to victims of life-threatening injuries or illnesses until they can be given accurate Medical care at the hospital [5].

BLS procedures include Cardiopulmonary Resuscitation (CPR), Artificial Ventilation, bleeding control and Basic Airway Management [5].

It is provided by health care providers (Physicians, Paramedics, and Emergency) and even could be given by lay persons who have received BLS training [6].

American Heart Association (AHA) recognizes and encourages early CPR and defibrillation to maximize victim's survival rates also; it promotes public awareness of BLS to assure quick response achieved in the case of an emergency [6-8].

Various studies were carried out to access the level of knowledge and attitude towards BLS among health care providers, which reflects its importance in the emergency care of the patients [9-11].

Therefore, we intended to carry out the present study to be added to the literature on this essential subject.

SUBJECTS AND METHOD

Aim of the Study

The study aimed to assess the level of BLS knowledge, attitude, and practice amongDental practitioners.

Objectives of the Study

- To determine the knowledge, attitudes, and practice on CPR.
- To find out the association between knowledge on CPR and selected demographicVariables.

Research Design

- This descriptive, cross-sectional study was conducted among practice among Dental practitioners.
- Qualitative and quantitative approaches wereapplied as a mixed research design.

Inclusion Criteria

- Dental Practitioners.

Exclusion Criteria

- Dental students.
- Medical, Nursing Paramedical students.
- Participants unwilling.
- Pilot study participants.

Participants Sample Size

Private Dental Practitioners. (n=92) were included in the study to avoid any selection bias.

The participants in this study were approximately 92,Systematic randomly chosen with ages ranging between 25 and 35 years

Pilot Study

A pilot study was conducted on 10 participants who were excluded from the study sample. It was conduct to test the questionnaires for their clarity, organization, applicability and to determine the length of time needed to collect the data. The necessary modifications were done.

Field Work

The researcher carried out the fieldwork through assessment, planning, implementation and evaluation phases.

The researchers started by introducing themselves to the participants, explaining to them the importance of the study and its procedures, and inviting them to participate. The authors went to the respective departments and distributed the questionnaire to the subjects and collected the questionnaires after adequate time.

The questionnaire was distributed personally by one of the authors and responses were filled by the participants themselves while the researchers were around. Each participant took approximately 15minutes to complete the questionnaire. The survey was anonymous and participation was voluntary with no incentives offered.

Instrument and Toolsfor data collection

After obtaining the informed consent from each participant, each one was asked to fill up the provided questionnaire in front of the investigator to avoid any malpractice while answering the questionnaire. The questionnaire and answer keys for the core questions on knowledge of BLS were generated using Basic Life Support manual from American Heart Association 2015 guidelines.

It consisted of two parts as follows:

- Part (1): Demographic characteristics of studied personnel.
- Part (2): Knowledge questionnaire sheet: second one consisted of the main goal and accuracy of CPR intervention, and the last segment comprised of 18 open ended questions and one closed ended questionnaire, targeting the indications, methods, and effectiveness of CPR.

Ethical Considerations

The participants selected were given the participant information sheet, which explained the details of the study, and written informed consent was obtained from those who agreed to participate in the study.

Statistical Analysis

Data entry and statistical analysis were done using the SPSS (Statistical Package for the Social Science-version 21).

Data obtained were summarized using descriptive statistics of mean, standard deviation, frequency, percentages and were presented using tables and pie charts.Statistical significance was considered at $p<0.0001$.

RESULTS

After collecting data, the values were statistically analyzed and tabulated.

The summary of the results drawn from the data were as follows:

A total of 92 Dental Practitioners responded to the questionnaire with a response rate of 100%. Male 83.6% (n=77) outnumbered female 16.3% (n= 15) Table-1.

Table-2 shows the descriptive statistics of the response to the questions on knowledge of Cardiopulmonary Resuscitation (CPR). 89.4% (n=82) of themgave right answers to the questions on CPR knowledge while over 10.5 %(n=10)gave negative responses.

The mean score for both theoretical knowledge and practice of BLS for trained Dental Practitioners was higher and the statistical difference was highly significant p<0.0001.

To summarize the knowledge and attitude of the participants they were enquired about their readiness or reluctance in performing BLS in necessary situations either in hospital or outside hospital settings. 67% (62) participants reported no reluctance in performing BLS in need either inside or outside hospital settings. 32.6% (30) reported reluctance in performing CPR either inside or outside hospital settings. The reason reported was lack of confidence.

Table-1: Social -Demographic Variables of Respondents (N=92)

Individual Scenario			
Variable		**Response (n)**	**Frequency (%)**
Total no of respondents		92	100
Gender	Males	15	16.3
	Females	77	83.6
Designation	Dental practitioners	92	100

Table-2: Descriptive Statistics of the Responses of the Interns to the Questions on CPR Knowledge (N=92)

Individual Scenario				
Parameters	**Variable**	**Response n (%)**	**Mean± SD**	**Inferential Statistics**
What does abbreviation AED stands for?	Advanced Electrical Defibrillator	5 (5.4)	23±31.37	P-0.027 SS
	Advanced External Defibrillator	8 (8.6)		
	Automated Electrical Defibrillator	9 (9.7)		
	Automated External Defibrillator	70 (76)		
What does abbreviation EMS stands for	Effective Medical services	14 (15.2)	23±15.89	**P < 0.0001 HS**
	Emergency management services	21 (22.8)		
	Emergency Medical services	**46 (50)**		
	External Medical support	11 (11.9)		
What is the abbreviation of "BLS"?	Basic Life Services	12 (13.0)	23±18.70	P=0.002 SS
	Basic Life Support	51 (55.4)		
	Basic Lung Support	14 (15.2)		
	Best Life Support	15 (16.3)		
According to 2015 BLS guidelines by American Heart Association(AHA)	Pulse check should be done only after opening airway and giving 2 rescue breaths	6 (6.5)	23±33.53	P=0.0397 SS
	Pulse is checked after checking response and breathing	11 (11.9)		
	Pulse is checked simultaneously along with breathing after checking for response	73 (79.3)		
	There is no need to check pulse before starting chest compressions	2 (2.1)		
During BLS, chest compressions are started when	The victim is responsive, coughing vigorously and has pulse	15 (16.3)	23±25.75	P=0.0074 SS
	The victim is unresponsive, breathing and has pulse	4 (4.3)		
	The victim is unresponsive, not breathing and has no pulse	61 (66.3)		
	The victim is unresponsive, not breathing and has pulse	12 (13.0)		
If you confirm somebody is not responding to you even after shaking and shouting at him. What will be your immediate action?	Activate EMS	15 (16.3)	23±21.43	P=0.0013 SS
	Observe	12 (13.0)		
	Put him in recovery position	55 (59.7)		
	Start CPR	10 (10.8)		
When are you supposed to check for pulse in BLS	3 minutes	10 (10.8)	23±16.12	**P < 0.0001**

during CPR?	5 minutes	22 (23.9)		**HS**
	Don't know	14 (15.2)		
	Every 2 minutes	**46 (50)**		
Depth of compression in Adults during CPR	½ – 1 inch	5 (5.4)	23±19.16	**P < 0.0001 HS**
	1 – 1½ inches	13 (14.1)		
	1½ – 2 inches	24 (26.0)		
	2½ – 3 inches	**50 (54.3)**		
Depth of compression in Children during CPR	½ – 1 inch	20 (21.7)	23±19.99	**P < 0.0001 HS**
	1 – 1½ inches	18 (19.5)		
	1½ – 2 inches	7 (7.6)		
	1½ – 1/3 inches	**47 (51)**		
Depth of compression in Neonates during CPR	½ – 1 inch	2 (2.1)	23±38.68	P=0.746 NS
	1 – 1½ inches	4(4.3)		
	1½ – 2 inches	5 (5.4)		
	1½ – 1/3 inches	81 (88)		
How many chest compression and breathing should be given in CPR in case of single rescuer?	10 chest compressions and 1 rescue breaths	5 (5.4)	23±26.49	P=0.0093 SS
	30 chest compressions and 1 rescue breaths	8 (8.6)		
	30 chest compressions and 2 rescue breaths at a rate of 100-120 compressions per minute	62 (67.3)		
	None of the above	17(18.4)		
In a new born the chest compression and ventilation ratio is	15:2	15 (16.3)	23±9.62	**P < 0.0001 HS**
	3:1	**37 (40.2)**		
	30:2	20 (21.7)		
	Don't know	20 (21.7)		
Rate of chest compression in Adult and Children during CPR	**100 / min**	**54 (58.6)**	23±20.67	**P < 0.0001 HS**
	120 / min	13 (14.1)		
	70 / min	13 (14.1)		
	80 / min	12 (13.0)		
What will be your primary management in case of Epileptic fits in the Dental chair?	Continue Dental procedure	3 (3.7)	23±38.66	P=0.074 NS
	Inject IV Diazepam	81 (88.0)		
	Make the patient lie on the lateral position and wait for seizures to end	4 (4.3)		
	None Of the above	4 (4.3)		
The right sequence for BLS is	A-B-C	16 (17.3)	23±7.071	**P < 0.0001 HS**
	B-C-A	19 (20.6)		
	C-A-B	**32 (34.7)**		
	C-B-A	25 (27.1)		
What is the location for chest compression in infants?	At the Intermammary line	8 (8.6)	23±26.72	P=0.0098 NS
	At Xiphisternum	63 (68.7)		
	One finger breadth above the nipple line	12 (13.0)		
	One finger breadth below the nipple line	9 (9.7)		
A patient is cited with airway obstruction during Dental treatment due to aspiration of foreign body, what would you do?	Examine mouth and local area	22 (23.9)	23±15.59	**P < 0.0001 HS**
	Ask patient to cough	16 (17.3)		
	Attempt Heimlich maneuver	9 (9.7)		
	All of the above	**45 (48.9)**		
A patient suffered from syncope when you commenced a Dental procedure. What would be your immediate action?	Continue Dental procedure	14 (15.2)	**23±20.70**	**P < 0.0001 HS**
	Make patient to sit in upright position.	13 (14.1)		
	Place patient in Trendelenburg position and give ammonia inhalant	**54 (58.6)**		
	None of the above	11 (11.9)		
Do you think you can handle any emergency condition on your Dental office very confidently?	Yes	62(67)	46±22	P =0.0420 SS
	No	30(32.6)		

NS: Not significant; SS: Significant; HS: Highly significant

HS=11/19=57.8%
SS=5/19=26.5%
NS3/19=15.7%
Right answer=17/19=89.4%
Wrong answer=2/19=10.5%

DISCUSSION

As 92 Dental Practitioners participated in the study and the majority (89.4%) of them had heard of BLS/CPR, the sample size was considered adequate for the interpretation of results.

As we had studied knowledge according to separate components like, Indications, Response to a Situation, and Signs of Successful Resuscitation.

It is essential that every individual in the community be aware of Basic Life Support to save lives as well as improve the quality of community health. At least, the future Doctors and nurses are expected to be well aware of it, as they will frequently face life threatening situations, and the awareness and knowledge of BLS will be useful to them [12].

Resuscitation is one of the most evolving areas of modern Medicine while Cardiopulmonary Resuscitation (CPR) is a treatment modality aimed at preventing sudden, unexpected death in life threatening situations. Health Professionals should have sound CPR/BLS knowledge and skills. Basic Life Support (BLS) and Advanced Cardiac Life-support (ACLS) is part of CPR [13, 14]. Basic Life-support (BLS) includes recognition of signs of Sudden Cardiac Arrest (SCA), Heart attack, cardiovascular stroke, foreign body airway obstruction and Automated External Defibrillator (AED) [14, 15].

BLS is Medical care which is used for victims of life threatening illness or injuries. It can be provided by trained Medical personnel, emergency Medical technician, Paramedics and by qualified bystanders with hands only, minimum airway equipment's and AED (Automated External Defibrillator) [16].

Various studies investigated the awareness of health professionals' knowledge and experiences of CPR [17, 18].

In a recent study, the awareness was examined among students, Doctors and nurses of Medical, Dental and Nursing colleges. The result showed that the awareness of health professionals about CPR was very poor [18] which was not significant to our study.

The life-threatening emergencies can occur any time, any- where and to anyone. Such situations are somewhat more likely to occur within the confines of the Dental office due to the increased level of stress which is so often present. For example, Fear and anxiety may make these patients prone to Medical emergencies such as Syncope and Hyperventilation. Dentists must be prepared to manage Medical emergencies which may arise in practice [19].

This study emphasized the Cognitive approach to the general perception and skills of Basic Life Support, early recognition of stroke and acute coronary syndrome. Although inevitable tragedies occur in Dental office, the Dentists should be aware of such incidents in terms of patient assessment, how and when to manage them, which would likely reduces such uneventful things. Hence, all the Medical and Dental academic Institutions should give an immense value in training all the students and faculties in the simple procedures collectively known as BLS [19].

The current study was compared to the study conducted by Sharma and Attar[20]only Interns; and Aroor*et al*., [10]only students and Interns of both Medical and Dental colleges. However, studies done only from the dental colleges were included in the studies by Narayan *et al*., [4],Baduni*et al*., [11],Roshana*et al*., [17],Sudeep*et al*.,[21] and Carvalho*et al*., [23].

In our study, the participants were aware of the BLSand had positive attitude toward it, similar to the other studies: Narayan *et al*.,[4], Roshana*et al*., [17], Sharma [20], Kumar *et al*., [22] and Carvalho*et al*., [23] whereas the participants were less aware and showed poor attitude toward it in the studies conducted by Chandrasekaran [9], Aroor [10],Sudeep*et al*., [21],Alanazi*et al*., [24], Zaheer [25], and Srinivas [27].

In the questionnaire survey done by Sharma [20] about adult BLS among Medical and Dental Interns, Medical interns had average knowledge and he favored the structured BLS training.

Narayan *et al*., [4] conducted a cross-sectional survey among Dental Interns and PG students about BLS, who found an average knowledge among them, indicating its involvement in the Academic curriculum and workshops on regular basis which were in accordance to our study.

No professional training and busy curriculum were the reasons for lack of BLS knowledge in our study, which was simulating the other studies done by Avabratha*et al*., [18], Kumar *et al*., [22],Aroor*et al*., [10],Zaheer andHaque [25], Roshana*et al*., [17] and Narayan *et al*., [4].

In 2010, AHA has changed the sequence of BLS for adults and Pediatric patients (excluding newborn) steps from "A‑B‑C" to "C‑A‑B." Because of updating of guidelines from 5 years, repetitive training courses are needed to ensure the changes.

The present study revealed that more than half of Dental Practitioners (59.6%) had sufficient awareness of BLS. The same finding has been reported by others [9, 26].

LIMITATIONS

- Sample size was small our study.
- Only theoretical, limited, knowledge was assessed.
- Practical skills and attitude to perform BLS was not assessed.
- The knowledge of only those who volunteered for the studywere assessed.

RECOMMENDATIONS

Publishing brochures set up awareness campaigns and establishment of a day or week annually regarding CPR in order to increase awareness.

Establishment of courses on CPR for Arts and Science colleges and increase its number in Medical and Dental colleges.

Establishment of training courses for selected Medical and Dental students to train other students in different colleges.

To conduct BLS programmes in almost all corners and sectors of our society, with the intention of creating numerous Basic Life Support responders.

CONCLUSION

The study was conducted to assess the effectiveness of structured teaching programme inimproving the knowledge level of Dental Practitioners onCardiopulmonary resuscitation.

Based on the above study it can be concluded that majority ofDental Practitioners in the present study hadabove desirable knowledge but were lacking confidence in handling some of the Medical emergencies.

Hence, in order to improve quality of patient care annual Basic life support [BLS] courses should be made mandatory in Dental teaching curriculum and further training is required in order to update theirknowledge.

ETHICAL DISCLOSURES

- **Protection of human and animal subjects:** The authors declare that no experiments were performed on humans or animals for this study.
- **Confidentiality of data:** The authors declare that no patient data appear in this article.
- **Right to privacy and informed consent:** The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no special financial support for this research work from the funding agency and there is no conflict of interest among all authors

ACKNOWLEDGMENT

All the authors express sincere gratitude to all respondents whose honest attention help and support and the participants of the study lead the Research project to worthful outcome

REFERENCES

1. Lalloo, R., Johnson, N. W., Blinkhorn, A. S., &Ichim, P. (2009). AustralianDental students views on a compulsory internship scheme. *Medical journal of Australia*,185(1):59-65.
2. Jodalli, P. S., &Ankola, A. V. (2012). Evaluation of knowledge, experience and perceptions about medical emergencies amongst dental graduates (Interns) of Belgaum City, India. *Journal of clinical and experimental dentistry*, *4*(1), 14-18.
3. Elanchezhiyan, S., Elavarasu, S., Vennila, K., Renukadevi, R., Mahabob, M. N., Sentilkumar, B., & Raja, S. (2013). Awareness of dental office medical emergencies among dental interns in Southern India: An analytical study. *Journal of dental education*, *77*(3), 364-369.
4. Narayan, D. P. R., Biradar, S. V., Reddy, M. T., & BK, S. (2015). Assessment of knowledge and attitude about basic life support among dental interns and postgraduate students in Bangalore city, India. *World journal of emergency medicine*, *6*(2), 118-122.
5. Abbas, A., Bukhari, S. I., & Ahmad, F. (2011). Knowledge of first aid and basic life support amongst medical students: a comparison between trained and un-trained students. *JPMA. The Journal of the Pakistan Medical Association*, *61*(6), 613-616.
6. Jones, C. M., Owen, A., Thorne, C. J., &Hulme, J. (2012). Comparison of the quality of basic life support provided by rescuers trained using the 2005 or 2010 ERC guidelines. *Scandinavian journal of trauma, resuscitation and emergency medicine*, *20*(1), 53.
7. Spencer, B., Chacko, J., &Sallee, D. (2011). The 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiac care: an overview of the changes to pediatric basic and advanced life support. *Critical Care Nursing Clinics*, *23*(2), 303-310.
8. Field, J. M., Hazinski, M. F., Sayre, M. R., Chameides, L., Schexnayder, S. M., Hemphill, R.,& Cave, D. M. (2010). Part 1: executive summary: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and

emergency cardiovascular care. *Circulation*, *122*(18_suppl_3), S640-S656.
9. Chandrasekaran, S., Kumar, S., & Bhat, S. A. (2010). Awareness of basic life support among medical, dental, nursing students and doctors. *Indian journal of Anaesthesia*, *54*(2), 121.
10. Aroor, A. R., Saya, R. P., Attar, N. R., Saya, G. K., &Ravinanthanan, M. (2014). Awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India. *Journal of emergencies, trauma, and shock*, *7*(3), 166.
11. Baduni, N., Prakash, P., Srivastava, D., Sanwal, M. K., & Singh, B. P. (2014). Awareness of basic life support among dental practitioners. *National journal of maxillofacial surgery*, *5*(1), 19.
12. Alsayil, S. N., Alzahran, S. M., &Alhawiti, W. M. (2016). Awareness of basic life support among medical and nursing students at Tabuk University. *Basic Res J Med ClinSci*, *5*(3), 53-57.
13. Robert, A. B.(2010). American heart association guidelines for Cardiopulmonary resuscitation and Emergency Cardiovascular Care. Science *Circulation*, 122:5685-5705.
14. Vaillancourt, C., &Stiell, I. G. (2004). Cardiac arrest care and emergency medical services in Canada. *The Canadian journal of cardiology*, *20*(11), 1081-1090.
15. Caffrey, S. L., Willoughby, P. J., Pepe, P. E., & Becker, L. B. (2002). Public use of automated external defibrillators. *New England journal of medicine*, *347*(16), 1242-1247.
16. Chowdari, A., Niranjan, G. M., & Dinesh, B. (2013). A cross-sectional study on awareness and perception about basic life support/cardio-pulmonary resuscitation among undergraduate medical students from coastal South India. *International Journal of Medicine and Public Health*, *3*(3), 146-150.
17. Roshana, S., Batajoo, K. H., Piryani, R. M., & Sharma, M. W. (2012). Basic life support: knowledge and attitude of medical/paramedical professionals. *World journal of emergency medicine*, *3*(2), 141-145.
18. Avabratha, K. S., Bhagyalakshmi, K., Puranik, G., Shenoy, K. V., & Rai, B. S. (2012). A Study of the Knowledge of Resuscitation among Interns. *Al Ameen J Med Sci*, *5*(2), 152-156.
19. Sangamesh, N. C., Vidya, K. C., Pathi, J., & Singh, A. (2017). Awareness, attitude, and knowledge of basic life support among medical, dental, and nursing faculties and students in the university hospital. *Journal of International Society of Preventive & Community Dentistry*, *7*(4), 161-167.
20. Sharma, R., & Attar, N. R. (2012). Adult basic life support (BLS) awareness and knowledge among medical and dental interns completing internship from deemed university. *NUJHS*, *2*, 6-13.
21. Sudeep, C. B., Sequeira, P. S., Jain, J., Jain, V., &Maliyil, M. (2013). Awareness of basic life support among students and teaching faculty in a dental college in Coorg, Karnataka. *Int Dent J Stud Res*, *2*(1), 4-21.
22. Chowdari, A., Niranjan, G. M., & Dinesh, B. (2013). A cross-sectional study on awareness and perception about basic life support/cardio-pulmonary resuscitation among undergraduate medical students from coastal South India. *International Journal of Medicine and Public Health*, *3*(3), 146-150.
23. 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.
24. Alanazi, A., Alsalmeh, M., Alsomali, O., Almurshdi, A. M., Alabdali, A., Al-Sulami, M., ...& Iqbal, Z. (2014). Poor basic life support awareness among medical and college of applied medical sciences students necessitates the need for improvement in standards of BLS training and assessment for future health care providers. *Middle East J Sci Res*, *21*(5), 848-854.
25. Zaheer, H., &Haque, Z. (2009). Awareness about BLS (CPR) among medical students: status and requirements. *JPMA. The Journal of the Pakistan Medical Association*, *59*(1), 57-59.
26. Casey, W. F. (1984). Cardiopulmonary resuscitation: a survey of standards among junior hospital doctors. *Journal of Research Soc Med*, 77:921-924.
27. Srinivas, H. T., Kotekar, N., & Rao, S. R. (2014). A survey of basic life support awareness among final year undergraduate medical, dental, and nursing students. *International Journal of Health & Allied Sciences*, *3*(2), 91-94.