

A Cross-Sectional Study on Awareness of Cardio-Pulmonary Resuscitation Practices and Perspective on Resuscitation Education Among Doctors of Varied Specialties in a Medical College Hospital

Selvakumar Palaniappan¹, Ramprassath MS^{2*}, Suganya S³, Karthik AR⁴, Rizwan Sulian Katchai Abdul Kader⁵, Shreedher Priyan N⁶

¹Associate Professor, Department of Anaesthesia, Velammal Medical College Hospital & Research Institute, Madurai, Tamilnadu, India

²Assistant Professor, Department of Cardiothoracic Surgery (MCH) Velammal Medical College Hospital & Research Institute, Madurai, Tamilnadu, India

³Assistant Professor, Breast and Endocrine Surgery, Velammal Medical College Hospital & Research Institute, Madurai, Tamilnadu, India

⁴Senior Resident, Department of ONCO Anaesthesia and Palliative Medicine, DR.B.R.Ambedkar Institute, Rotary Cancer Hospital, AIIMS - New Delhi, India

⁵Department of Statistics, Manonmaniam Sundaranar University, Tirunelveli, India

⁶Junior Resident, Velammal Medical College Hospital & Research Institute, Madurai, Tamilnadu, India

Received: 15-03-2021 / Revised: 23-04-2021 / Accepted: 27-05-2021

Abstract

Contest: One of the emergencies in a hospital is a cardiac arrest, and this can be managed effectively by basic life support skills. The knowledge of doctors on cardiopulmonary resuscitation and their perspective of the need for education plays a vital role in providing effective care. Hence, this study was conducted with an aim to study the awareness among doctors on cardio-pulmonary resuscitation practices and their perspective on resuscitation education. **Methods:** A cross-sectional study was conducted at a Medical College from July 1-Aug 15, 2016. Two hundred doctors who have completed MBBS with internship were recruited as study participants. A prestructured questionnaire with sections on sociodemographic data, knowledge of resuscitation guidelines, self-perceived proficiency in resuscitation skills, source of such knowledge, and suggestions for future improvements were administered. The data was analyzed using CoGuide version 1.0. **Results:** The mean age was 35.71±13.25 years in the study population. The majority (51.4%) reported correctly that the AHA organization publishes periodical CPR guidelines. Very proficient procedural skills were reported in IV line (54.05%), chest compression (52.7%), reasonably proficient procedural skills were reported in Guedel airway, ventilation, intubation, defibrillator, management as the leader. The mean total knowledge score was 3.64±1.35. **Conclusion:** This study revealed a poor overall knowledge regarding CPR among doctors of varied specialties. However, it was observed that there existed a positive attitude towards resuscitation education among doctors. In conclusion, there is a need for improving the CPR education in the medical curriculum.

Keywords: Cardiopulmonary Resuscitation, Knowledge, Education, Physicians, Perception.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

In cardiac arrest, early identification and intervention save lives.[1] The victim's chance at survival decreases 7% to 10% every minute without proper cardiopulmonary resuscitation(CPR) or defibrillation. [2] In the developed countries, the rate of in-hospital cardiac arrest treated by resuscitation teams and receiving CPR is approximately two per 1000 admissions.[3] In developed countries, the training of hospital staff and the employment of dedicated

resuscitation teams, and the pre-employment mandating of CPR certification have helped enhance outcomes of in-hospital cardiac arrest.[4] Whereas, in developing countries, there is limited reported data on the incidence, organization, and consequences of in-hospital CPR.[5] Since CPR is an essential skill, health care providers (HCPs), irrespective of their working-level or work setting, should be competent in initiating and performing CPR. Hospitals should provide training to their staff.[6,7] The knowledge of CPR amongst HCPs is significantly influenced by training[8], and it is a significant determinant of the success of CPR.[9] To acquire this knowledge, routine training on CPR should be emphasized.[10] International recommendations dictate that HCPs repeat a CPR course at least every two years.[9,10]

Many studies assessing the knowledge and awareness about CPR practices have been done, but most of those studies have been done in paramedical personnel and medical students. Very few studies

*Correspondence

Dr. Ramprassath MS

Assistant Professor, Department of Cardiothoracic Surgery (MCH) Velammal Medical College Hospital & Research Institute, Madurai, Tamilnadu, India

E-mail: cmcrampi@gmail.com

have been done on doctors, primarily as part of the study population, paramedical personnel, and medical students. The survey done by Aroor et al. [11] on medical students and interns in South India indicated that awareness of basic life support was below average requiring professional training. Boddu et al.[12]concluded that practical knowledge of performing CPR was low among trainee and practicing oral surgeons. A similar study was done by Narayan et al. [13] on dental interns, and postgraduate students emphasized that CPR should be made a part of the dental curriculum. A large study with 1054 participants involving personnel from various cadres of medical and paramedical profession conducted by Chandrasekaran et al. [14] found that awareness about BLS was dismally poor. There exist a lacuna in the literature regarding the awareness level among doctors.Hence, this study was planned to assess the awareness of cardio-pulmonary resuscitation practices and perspective on resuscitation education among doctors of varied specialties in a medical college hospital.

Methods

A cross-sectional study was conducted at a Medical College from July 1-Aug 15, 2016. Two hundred doctors who have completed MBBS along with internship were considered as the study population. A prestructured questionnaire was used for data collection. The questionnaire had sections on sociodemographic data, knowledge of resuscitation guidelines, self-perceived proficiency in resuscitation skills, source of such knowledge, and suggestions for future improvements. Out of the total 200 questionnaires distributed, 148 were returned completed. The rest were either not returned or were incompletely filled. So total N=148, and only completed

questionnaires were taken for analysis. Hence the response rate was 74 %. Proficiency in procedural skills was self-assessed based on the following skill set; securing an IV line, inserting an oropharyngeal Guedel airway, AMBU bag and mask ventilation, endotracheal intubation, giving effective chest compressions, using the defibrillator, and overall management of resuscitation as a leader of the team.

Sample Size Calculation:The sample size was calculated assuming the mean knowledge score on CPR guidelines as 10.56 as per the study by Nisha L. S et al. [15] The other parameters considered for sample size calculation were 80% power and 95% confidence level. The required sample size as per the above-mentioned calculation was 133. To account for a non-participation rate of about 11%, another 15, subjects will be added to the sample size. Hence the final required sample size would be 148.

Statistical Methods:Knowledge, procedural skills, experience, and practice of BLS/ACLS guidelines were considered as primary outcome variable/variables. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. Data was analyzed by using coGuide software, V.1.03.[16]

Result

A total of 148 subjects were included in the final analysis.

The mean age was 35.71 years in the study population. Among the study population, 84 (56.76%), 84 (56.8%) completed MBBS before 2009, and 64 (43.2%) after 2010. (Table 1)

Table 1: Summary of demographic parameter (N=148)

Summary	Parameter
Age (in years)	35.71 ± 13.25(ranged 23 to 69)
Age group	
upto 30 years	67(45.27%)
31 to 40 years	47(31.76%)
41 to 50 years	7(4.73%)
51 years and above	27(18.24%)
Gender	
Male	84(56.76%)
Female	63(43.24%)
Year of completion of MBBS internship	
Upto 2009	84(56.8%)
2010 and later	64(43.2%)
Undergraduate Institute	
Central Govt	3(2.03%)
Private	51(34.46%)
State Govt	94(63.51%)
Postgraduate Institute	
Central Govt	33(22.30%)
Private	47(31.76%)
State Govt	68(45.95%)
Super Specialty Institute	
Central Govt	5(3.38%)
Others	41(27.70%)
Private	46(31.08%)
State Govt	56(37.84%)
Under graduation	
Bihar	3(2.03%)
Karnataka	9(6.08%)
Puducherry	9(6.08%)
Tamil Nadu	127(85.81%)
Postgraduation	
Andra	13(8.78%)
Chandi	2(1.35%)
Delhi	18(12.16%)

Karnataka	26(17.57%)
Maharashtra	11(7.43%)
Puducherry	8(5.41%)
Tamil Nadu	70(47.30%)
Super-specialty	
Chandi	37(25%)
Karnataka	45(30.41%)
Tamil Nadu	66(44.59%)

The majority of 51.4% were reported as AHA organization publishes periodical CPR guidelines, 46.6% participants were latest CPR guidelines published in 2015, 79.1% were reported as seeing a person

faint in a public place first check for pulse and breathing. The mean total knowledge score was 3.64 in the study population. (Table 2)

Table 2: Summary of knowledge of BLS/ACLS guidelines (N=148)

Knowledge of BLS/ACLS guidelines	Percentage
Which organization publishes periodical CPR guidelines	
AHA (right answer)	76(51.4%)
ASA	48(32.4%)
wrong answer	9(6.1%)
Don't know	15(10.1%)
In How many years once are the guidelines updated	
Once in 5 years	52(35.14%)
Wrong answer	96(64.86%)
The Latest CPR guidelines were published in	
2015	69(46.6%)
Wrong answer	40(27.03%)
Don't know	39(26.4%)
You see a person faint in a cinema theatre. your first response would Be	
Check for pulse and breathing	117(79.1%)
Wrong answer	31(2.095%)
You See A patient unresponsive with no palpable carotid pulse during your ward	
Give chest compressions	73(49.3%)
Wrong answer	75(50.68%)
You Are on rounds in an ICU. the intensivist Is attending on one particular patient	
Get a defibrillator and give a shock	50(33.8%)
I would do all the above-said measures	53(35.81%)
Wrong answer	45(30.4%)
Mean total knowledge score	3.64 ± 1.35(ranged 0 to 6)

Very proficient procedural skills were reported in IV line (54.05%), chest compression (52.7%), reasonably proficient procedural skills were reported in Guedel airway, ventilation, intubation, defibrillator, and management as the leader. Experience in doing the procedure

was reported as >20 times for IV line, ventilation, chest compression and as <10 times for Guedel airway, intubation, defibrillator, and management as the leader. (Table 3)

Table 3: Summary of procedure skills and experience (N=148)

Procedural skills	Iv line	Guedel's airway	Ventilation	Intubation	Chest compressions	Defibrillator	Management as leader
Very proficient	80 (54.05%)	49 (33.11%)	69(46.62%)	38(25.68%)	78 (52.70%)	38(25.67%)	38(26.67%)
Reasonably proficient	65(43.92%)	60(40.54%)	72(48.64%)	60(40.54%)	62(43.24%)	57(38.51%)	67(45.27%)
Not proficient	3(2.03%)	39(26.35%)	7(4.73%)	50(33.78%)	6(5.41%)	51(35.81%)	43(29.05%)
Procedural skills& experience							
>20 times	130(87.84%)	42(28.37%)	66(44.59%)	48(32.43%)	73(49.32%)	30(20.27%)	36(24.32%)
10 to 20 times	10(6.76%)	27(18.24%)	35(23.64%)	17(11.48%)	42(28.38%)	17(11.49%)	25(16.89%)
<10 times	8(5.40%)	79(53.38%)	47(31.76%)	83(56.08%)	33(22.30%)	27(68.24%)	87(58.78%)

CPR practices during medical education were reported by 131 (88.51%), whereas the majority practiced during their under graduation (71%). The major source for this knowledge of CPR practices was besides clinical postings, Practical sessions on mannequins. Seminars/ Conferences were attended by 35.81% to know CPR practices. Only 45.95% felt that adequate importance is

being given to teaching basic life support, 89.86% felt CPR practices knowledge should be evaluated by exams before passing MBBS final exams, and 92.56% felt that one should periodically update on the latest CPR guidelines; 94.59% were interested in participating in any such update activity on CPR In the future. (Table 4)

Table 4: Summary of exposure to CPR practices (N=148)

Exposure to CPR practices	Percentages
CPR practices anytime during your medical education	
Yes	131(88.51%)
No	17(11.49%)
If yes, during which course were you briefed(N=131)	
Undergraduate	93(71%)
Postgraduation and super specialization	38(29%)
If you were briefed about CPR practices during your undergraduate medical education curriculum (MBBS), the source of knowledge was	
Didactic lectures in theory classes	49(37.11%)
Bedside clinical postings	61(41.21%)
Practical sessions on mannequins	61(41.21%)
Taught by seniors	54(36.49%)
Read on my own out of interest	19(12.83%)
Not exposed to CPR practices during MBBS tenure	9(6.08%)
Have you ever attended the following sessions on CPR practices?	
Seminars / Conferences	53(35.81%)
Workshops	40(27.03%)
Structured Courses Like BIs/Acls Training	47(31.76%)
Not attending any of the above	47(31.76%)
Out of your own interest, have you ever read about CPR from books, the internet, journals	107(72.29%)
Opinion and attitude	
Do you feel adequate importance is being given to teaching basic life support	68(45.95%)
Do you feel these should be evaluated by exams before passing MBBS final exams	133(89.86%)
Do you feel you should periodically update yourself on the latest CPR guidelines	137(92.56%)
If yes, the onus of keeping you abreast of the latest CPR guidelines rest on	
Yourself	81(54.73%)
Institution/Workplace	97(65.54%)
Medical Council	34(22.97%)
Would you participate in any such update activity on CPR In the future	140(94.59%)

Discussion

The study findings revealed that there was insufficient knowledge of CPR-related practices among the study population. The majority of the participants felt the need for resuscitation education among the doctors. Our study showed that even though doctors are expected to manage cardiopulmonary arrest by effective CPR techniques, the knowledge on the same remained poor among them. The overall knowledge score among the participants was 3.64 ± 1.35 out of a total of six. This proved a lack of adequate knowledge and updated CPR guidelines. This finding was similar to studies done in the past among various health care professionals, demonstrating poor knowledge.[14,17,18] This lack of knowledge can be attributed to a lack of structured training in under graduation or postgraduation period on CPR and BLS. In this study, it was observed that the 2015 guidelines update was not known to many of the participants (53.43%), which indicates the lagging in constant updates and awareness regarding the periodic change in guidelines. Refresher courses on various updated guidelines and training in CPR are the need of the hour. Similar suggestions of regular refresher courses every six months were made by Benden H et al. [19] and Goodwin A et al. [20]The next part of the study on procedural skills showed that very proficient procedural skills were reported in IV line, chest compression, reasonably proficient procedural skills were reported in Guedel's airway, ventilation, intubation, defibrillator, and management as the leader. Regular training and practice sessions on dummies can help in improving procedural skills. The attitude of the doctors plays a significant role in improving the current status of lack of knowledge. In this study, a positive attitude

was observed among the doctors towards resuscitation education and regular CPR refresher sessions. The limitations of the current study are that it is a self-administered questionnaire-based study where the subjective assessment of the self was done. A study with a practical evaluation of the skills-based on observing during the clinical rounds can be planned in the future.

Conclusion

This study showed that an evident lack of knowledge of CPR among doctors exists, particularly about the updates made in the 2015 American Heart Association (AHA) guidelines. However, there was an overall positive attitude towards resuscitation education.

References

1. Field JM, Hazinski MF, Sayre MR, Chameides L, Schexnayder SM, Hemphill R, et al. Part 1: Executive summary: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*, 2010, 122(SUPPL. 3).
2. Larsen MP, Eisenberg MS, Cummins RO et al. Predicting survival from out-of-hospital cardiac arrest: a graphic model. *Ann Emerg Med*. 1993; 22:1652-1658.
3. Nolan JP, Soar J, Smith GB, Gwinnutt C, Parrott F, Power S et al. Incidence and outcome of in-hospital cardiac arrest in the United Kingdom National Cardiac Arrest Audit. *Resuscitation*. 2014; 85(8):987-92.
4. Bhanji F, Finn JC, Lockey A, Monsieurs K, Frengley R, Iwami T et al. Part 8: Education, implementation, and teams: 2015 international consensus on cardiopulmonary resuscitation and

- emergency cardiovascular care science with treatment recommendations. *Circulation*. 2015;132:S242–68.
5. Wachira B, Tyler M. Characterization of in-hospital cardiac arrest in adult patients at a tertiary hospital in Kenya. *Resuscitation*. 2015;96:107.
 6. Roshana S, KH B, RM P, MW S. Basic life support: knowledge and attitude of medical/paramedical professionals. *World J Emerg Med*. 2012;3(2):141.
 7. Kaihula WT., Sawe HR, Runyon MS et al. Assessment of cardiopulmonary resuscitation knowledge and skills among healthcare providers at an urban tertiary referral hospital in Tanzania. *BMC Health Serv Res*. 2018; 18:935.
 8. Chamberlain DA, Hazinski MF. Education in Resuscitation: An ILCOR Symposium Utstein Abbey Stavanger, Norway June 22-24, 2001. *Circulation*. 2003;108(20):2575–94.
 9. Govender K, Rangiah C, Ross A, Campbell L. Retention of knowledge of and skills in cardiopulmonary resuscitation among healthcare providers after training. *South African FamPract*. 2010;52(5):459–62.
 10. Timerman S, Gonzalez MMC, Mesquita ET, Marques FRB, Ramires JAF, Quilici AP et al. The International Liaison Committee on Resuscitation (ILCOR). Roll in guidelines 2005-2010 for cardiopulmonary resuscitation and emergency cardiovascular care. *Arq Bras Cardiol*, 2006, 87(5):1
 11. Aroor AR, Saya RP, Attar NR, Saya GK, Ravinanthanan M. Awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India. *J Emergencies, Trauma Shock*. 2014;7(3):166–9.
 12. Boddu S, Prathigudupu RS, Somuri AV, Lingamaneni KP, Rao P, Kuchimanchi PK. Evaluation of knowledge and experience among oral and maxillofacial surgeons about cardiopulmonary resuscitation. *J Contemp Dent Pract*. 2012;13(6):878–81.
 13. Narayan DPR, Biradar SV, Reddy MT, BK S. Assessment of knowledge and attitude about basic life support among dental interns and postgraduate students in Bangalore city, India. *World J Emerg Med*. 2015;6(2):118.
 14. Chandrasekaran S, Kumar S, Bhat SA, kumar S, Shabbir PM. Awareness of basic life support among medical, dental, nursing students and doctors. *Indian J Anaesth*. 2010;54(2):121–6.
 15. Nisha LS.A Study To Assess the Knowledge About Cardiopulmonary Resuscitation Guidelines Among Cardiac Nurses. *JAMA Intern Med*. 2011;293(2):305–10.
 16. BDSS Corp. Released 2020. coGuide Statistics software, Version 1.0, India: BDSS corp.
 17. Pantazopoulos I, Aggelina A, Barouxis D, Papapanagioutou P, Troupis G, Kotsiomitis E et al. Cardiologists' knowledge of the 2005 American Heart Association Resuscitation Guidelines: The Athens Study. *Hear Lung J Acute Crit Care*. 2011; 40(4):278–84.
 18. Chaudhari MS, Panchal NN, Kamat HV, Ganjiwale J. Knowledge of 2015 basic life support (BLS) guidelines among doctors and nursing staff of a rural based tertiary care hospital, in western India: Current status and requirement. *Indian J ClinAnaesth*. 2017;4(2):193–7.
 19. Berden HJMM, Willems FF, Hendrick JMA, Pijls NHJ, Knape JTA. How frequently should basic cardiopulmonary resuscitation training be repeated to maintain adequate skills? *Br Med J*. 1993;306(6892):1576–7.
 20. Goodwin APL. Cardiopulmonary resuscitation training revisited. *J R Soc Med*. 1992;85(8):452–3.

Conflict of Interest: Nil

Source of support: Nil