



A STUDY OF AWARENESS OF CPR AMONG POSTGRADUATE STUDENTS IN A TERTIARY HEALTHCARE CENTER OF WESTERN INDIA

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ABSTRACT

INTRODUCTION: Cardiac arrest is an emergency situation in and outside hospital setup carrying high risk of mortality. But if early Cardio Pulmonary Cerebral Resuscitation (CPCR) is initiated, the survival rate can be improved. Therefore, the awareness and knowledge of CPR in medical and paramedical professionals is an important factor deciding the outcome of CPR and survival rate. **MATERIALS AND METHODS:** A cross sectional, questionnaire based study was conducted by assessing 10 questions each regarding awareness of CPR and basic knowledge of practical skills of CPR in all Postgraduate (PG) students of a medical college cum tertiary hospital. After applying exclusion criteria, the study was conducted in 233 PG students. The results were analyzed using an answer key based on 2015 guidelines of American Heart Association (AHA) for CPR. **RESULTS:** 50.64% students secured >60% marks, while 38.20% and 11.16% students secured 40-60% and <40% marks respectively in knowledge based questionnaire. 26.18% of students were familiar with the use of Automated External Defibrillator (AED). All PG students (almost 100%) who participated in the study were interested in learning CPR. Students who received previous CPR training were 17.16%. **CONCLUSION:** Though the knowledge score was excellent (>60%) in 50% of the study population, it was not adequate. Training of CPR should be emphasized more as PG students are at the forefront of the tertiary level of health care system.

KEYWORDS : CPR Awareness; CPR; AED, Postgraduate medical students

INTRODUCTION

Cardiac arrest is the abrupt loss of heart function that leads to inadequate oxygen and nutrient delivery to tissue, shock and ultimately death. It is typically associated with loss of consciousness, collapse, lack of palpable pulse, pale or cyanotic mucous membranes, lack of effective respiration, and lack of measurable blood pressure.

Cardio Pulmonary Cerebral Resuscitation (CPCR) refers to reestablishing blood flow to the cerebral and coronary systems in the event of cardiac arrest by performing manual cardiac and thoracic compressions and manual ventilation until spontaneous circulation and ventilation occurs.

Cardiac arrest is an emergency situation in and outside hospital setup carrying high risk of mortality, but if CPR is initiated early then the survival rate can be improved.^[1] Quality of life is also found to be better for victims who immediately receive bystander CPR.^[2] Studies have shown that immediate CPR after collapse due to ventricular fibrillation doubles or even triples the chances of survival. In contrast survival chances decrease by 7-10% for every minute, if CPR is delayed.^[3] Therefore, early recognition of clinical signs of cardiac arrest and application of quality CPR should be aimed at. High quality CPR is the cornerstone of a system of care that can optimize outcomes beyond return of spontaneous circulation (ROSC). Return to a prior quality of life and functional state of health is the ultimate goal of a resuscitation system of care.^[4]

Many times Postgraduate (PG) students in government medical colleges are the first attendant to the patients suffering sudden cardiac arrest. These health care professionals are, therefore, expected to be competent to resuscitate these patients till the arrival of ACLS team.

This study was aimed to explore the level of awareness, knowledge and attitude towards CPR among postgraduate resident doctors in a tertiary level hospital-cum-medical

college. If the knowledge of CPR is found to be inadequate (<40%) in these study subjects, simulation based CPR training programs can be arranged.

AIMS AND OBJECTIVES

- To assess Awareness of and Attitude towards CPR
- To assess the level of Knowledge about basic practical skills of CPR
- To identify the level of need required to educate and reinforce the PG students for resuscitation skills.

METHODS

1) Study Subjects:

- Inclusion Criteria-**All Postgraduate students of all specialities in a government medical college of western India
- Exclusion Criteria-**
 - Clinical work experience \geq 5 years in pre PG period
 - Resident doctors working in ICU – anaesthesia, medicine, paediatrics
 - Absent during the study, incomplete questionnaire or refusing participation in the study

2) Study Design: It is a cross sectional questionnaire based study.

A Questionnaire based on 2015 guidelines of American Heart Association (AHA) for CPR^[5] was given to the participants.

The questions were reviewed and validated by the experienced professors and associate professors of Department of Anaesthesia currently involved in many Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS) training programs. The study protocol was examined and validated by conducting a well-designed comprehensive pilot study for readability and ease of understanding. Pilot study was conducted among 20 randomly selected Post Graduate students which was later modified based on critical feedback forms.

Questionnaire included the following:

1) Basic characteristics of participants

Age	Sex	Admission Year	Department

2) Previous CPR Training status

3) 10 Open Ended Questions- to assess Awareness of and Attitude towards CPR

4) 10 Multiple Choice Questions- to assess the Knowledge of basic practical skills of CPR

3) **Sample Size:** all subjects in study population.

4) Data Collection:

The students were met during their department PG activity or immediately after OPD and were asked to fill up the questionnaire under observation to avoid malpractice while answering the questions. Informed consent was obtained from each participant.

5) Data Analysis:

The above participants were analyzed under pre/paraclinical (PC) group and clinical (C) group separately. All the students of post-graduation that is junior residents 1, 2 and 3 were included. Knowledge based questionnaire was Closed ended which had one correct answer. 1 mark was awarded for each correct answer and 0 mark for the incorrect answer. Total marks were converted into percentage. Knowledge was assessed depending on score as follows-

Score (%)	Grading
>60%	Excellent
40-60%	Good
<40%	Poor

Adequacy of knowledge was considered if >80% from all students have >60% marks.

RESULTS

Out of 274 PG students, 233 participated in the study. Remaining were either absent or refused or gave incomplete answers during the survey. Results were analysed in the form of percentage. Among the 233 responders, 173 were clinical students and 60 pre-para clinical PG students. Though the number of clinical students was more than paraclinical, the distribution of JR I, JR II, and JR III was equal in both the groups (Table No.1)

Awareness of CPR among students is summarized in Table No.2. Only 75.54% of student knew the long form of CPR, but all of them were interested in learning CPR and they thought that CPR training should be made compulsory. 5.58 had gone through the recent guidelines for resuscitation. In addition, 26.18% were able to use the AED. All the students showed a positive attitude towards learning providing and teaching CPR (> 90%) (Table No.3)

Knowledge score of basic practical skills of CPR is given in Table No.4, showing only half (50.64%) of the students have scored >60% marks while 38.20% students scoring 40-60% marks and 11.16% students scoring <40% marks. Comparison of knowledge score of both the groups-(PC) and (C) is elaborated separately in Table No.5 which shows that 22.33% students in (PC) and 56.65% in (C) group having >60% marks

Table No.1: Study Population

Participants	JR-1	JR-2	JR-3	Total
Clinical (C)	65	56	52	173
Pre-Para Clinical (PC)	20	20	20	60
Total	75	76	72	233

(Total = 233/274 Study Population)

Table No.2: Questions regarding the awareness of CPR

Sr No.	Question	Correct Answers (%)
1	What is the long form of CPR?	75.54 %
2	Can CPR be given in out of hospital set up?	96.99%
3	Can Basic Life Support (BLS) training be given to nonmedical person also?	98.71%
4	Are you able to use Automated External Defibrillator (AED)?	26.18%
5	In case of paediatric patients and newborn, whether resuscitation should be done by specialist only?	66.52%
6	What is the emergency dial number in case of witnessed cardiac arrest out of hospital?	59.23%
7	Have you read or gone through the recent guidelines for resuscitation?	5.58%

Table No.3: Attitude toward CPR

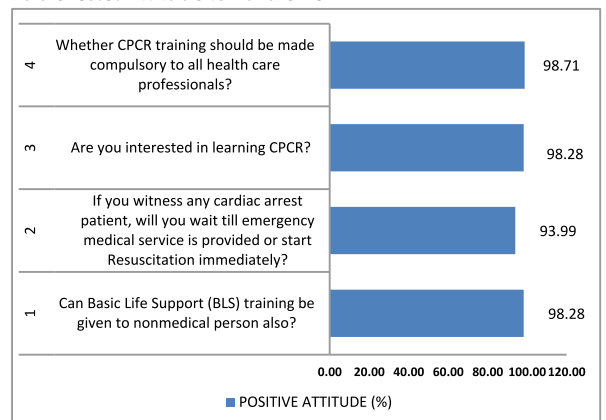


Table No.4: Knowledge of Practical skills of CPR

Sr No.	Score (in Percentage %)	No. of Students (in %)
1	< 40%	11.16%
2	40-60%	38.20%
3	>60%	50.64%

Table No.5: Comparison of Knowledge Score of Clinical (C) and Pre-Para Clinical (PC) Students

Sr No.	Score (%)	Pre-Para Clinical (PC) Students (%)	Clinical (C) (%)
1	< 40%	13.33%	10.40%
2	40-60%	53.33%	32.95%
3	> 60%	22.33%	56.65%

Among the 115 students who scored >60% marks, 35 were trained while among those scoring < 60% marks only 5 were trained previously (Table No.6). There is almost equal distribution of knowledge scores in all the three years' students of post graduation as shown in Table No.7

Table 6 Comparison of Knowledge between Trained & Untrained Students

Sr No	Knowledge Score	TRAINED (No of Students)	UNTRAINED (No. of Students)	Total
1	> 60%	35	80	115
2	< 60%	5	113	118
Total		40	193	233
Chi Square Value			28.1085	
P value			0.0001*	

Table no. 7 Association of post graduation Year & Knowledge

Postgraduation Year	Knowledge Score < 60%	Knowledge Score > 60%	TOTAL
JR-I	44	41	85
JR-II	39	37	76

JR-III	35	37	72
TOTAL	118	115	233
Chi Square Value	0.1755		

DISCUSSION

In the past, whenever the heart ceased functioning, a patient was considered as dead. However now it is well known that CPR when started within four minutes increased the chances of patient's survival^[6]. CPR training for all health care professionals has been recommended since the inception of formal CPR guidelines more than 40 years ago.^[7] Early activation of CPR have saved thousands of lives around the globe. These resurrected lives demonstrate the importance of resuscitation research and clinical translation.^[8]

Although technologies such as AED (automated external defibrillator) contributed to increased survival from cardiac arrest, there will be no outcome if bystander is not ready and unable to act. So every person in community should be trained in basic life support. As doctors frequently face life threatening situations, they play a vital role in the final outcome of acute medical emergencies. In a tertiary care hospital, postgraduate students i.e. resident doctors are the first called upon as soon as cardiac arrest is noticed. Tertiary care hospitals carrying a major load of patients in society, the awareness, knowledge and practical skills of CPR in PG students can improve the outcome tremendously.

Present study was aimed to assess the level of awareness and knowledge of basic practical skills of CPR amongst post graduate resident doctors of a tertiary level medical college cum hospital. The study was questionnaire based which included 10 open ended questions related to awareness of and attitude towards CPR while 10 close ended questions related to knowledge of basic practical skills of CPR. All the questions were based on 2015 guidelines of American heart association (AHA) for CPR. Practical, easily understandable and most important areas of CPR at par with the student's knowledge were chosen.

Overall, only half of the students that is 50.64% secured >60% marks. This shows that the knowledge of CPR is not adequate as was decided previously before starting the study. Considering clinical and pre-para clinical groups separately, 56.65% and 22.33% students secured >60% marks respectively. Here again neither of the two groups have more than 80% students for the knowledge to be considered as adequate. The percent of students scoring more than 60% is more in clinical group which might be due to frequent exposure to medical emergencies in clinical group. Certain questions where majority of students failed to answer were recommended chest compression rate, location of chest compression site, monitor to assess adequacy of resuscitation and proper steps of AED use.

As far as awareness about CPR is concerned, 25% of the total students did not know the long form of CPR. More so with the second C of the new term CPR (cardiopulmonary cerebral resuscitation). Disturbingly, a significant fraction of major health care providers of society (59.23%) did not know the national emergency dial number as '108' in case of medical emergencies out of hospital. 26.18% of students were well acquainted with the proper steps of using AED, while 5.58% of them were aware of recent 2015 guidelines of AHA for CPR. As guidelines are revised from time to time (every 5 years), above results emphasize the need of refresher's training cannot be ignored to correct poor technique and to ensure changes are addressed. Though large number of students were ignorant regarding the important aspects of CPR, their interest and zeal to know and be part of CPR must be appreciated.

Chandrasekaran et al⁹ conducted a cross-sectional study for

the awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing colleges with a majority of them securing less than 50% marks. They concluded that the awareness of BLS in the study group was very poor and needed to be improved.

Meena Kumari et al¹⁰ evaluated the awareness, knowledge and interest in CPR among undergraduate medical students. They observed that though the awareness of CPR was good among the students, they lacked the skills and knowledge, which have to be mastered by proper training programs.

Narayan et al¹¹ assessed the knowledge and attitude about BLS among dental interns and PG students and found that they had average knowledge and around 40% of them had negative attitude towards BLS. They recommended the inclusion of CPR in dental curriculum and workshops on a regular basis.

A similar study, conducted by Vural et al¹² in nursing students emphasized that though their knowledge was good, their skills needed to be improved by training programs at regular intervals.

Elif et al^[13] and Mohamed et al^[14] also observed that previous experience in real life resuscitation increased the incidence of correct answers. In our study, 15.02% of clinical group and 20% of pre-para clinical group had undergone CPR training previously and their knowledge scores were 80% and 73% respectively. This observation must be noted and is of great clinical significance and has been proven in other studies as well.^[15,16]

CONCLUSION

Along with the theoretical knowledge of CPR, there is an absolute necessity of encouraging to learn, master and execute the practical skills of CPR. If all health care providers become efficient in this life saving tool, they can successfully train other people in society. This will help in widening the spectrum of CPR awareness and prevent disabilities.^[17]

LIMITATIONS

1. The study would have been more assertive if we could evaluate practical skills of students along with knowledge.
2. Guesswork while solving knowledge based questions by students leading to bias cannot be denied.

AWARENESS AND ATTITUDE

1. CPR stands for?
2. Can CPR be given in out of hospital set up?
3. Can CPR (BLS) training be given to nonmedical person also?
4. If u witness any cardiac arrest patient, will u wait till emergency medical service is provided or start Resuscitation immediately?
5. Are u able to use Automated External Defibrillator(AED)?
6. In case of paediatrics and newborn, whether resuscitation should be done by specialist only?
7. Are you interested in learning CPR?
8. What is the emergency dial number in case of witnessed cardiac arrest out of hospital?
9. Whether CPR training should be made compulsory to all health care professionals?
10. Have u read or gone through the recent guidelines for resuscitation?

KNOWLEDGE OF CPR

1. All are the signs of cardiac arrest except?
 - a. Absent pulse
 - b. Nonresponsiveness
 - c. Gasping respiration
 - d. Weakness

2. Which pulse should be palpated to diagnose cardiac arrest?

- Carotid
- Brachial
- Ulnar
- Radial

3. What is the recommended chest compression rate in CPR in adults?

- 80-100/min
- 100-120/min
- 120-140/min
- 140-160/min

4. What is the compression site in adults?

- Upper sternum
- Lower sternum
- Xiphisternum
- Left side of chest

5. What is the sequence of Airway, Breathing and Circulation during resuscitation?

- A-B-C
- B-C-A
- C-A-B
- C-B-A

6. What is the ratio of compression and breathing during Basic Life Support?

- 30:2
- 30:4
- 30:6
- 30:8

7. Which is the non shockable rhythm?

- Asystole
- Ventricular tachycardia
- Ventricular fibrillation
- None of the above

8. All are maneuvers for opening airway except?

- Chin lift
- Jaw thrust
- Head tilt
- Neck flexion

9. For monitoring adequate ventilation during resuscitation, which monitor should be used?

- Oxygen saturation
- End tidal Co₂
- Respiratory rate
- ECG

10. Proper steps for operating an AED are-

- Power on AED, attach electrode pads, shock the individual and analyze the rhythm
- Power on AED, attach electrode pads, analyze the rhythm, clear the individual and deliver shock
- Attach electrode pads, check pulse, shock individual and analyze rhythm
- Check pulse, attach electrode pads, analyze rhythm and shock patient.

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