

Critical Hours in Saving a Life: Knowledge and Awareness about Basic Life Support and Effect of Cardiopulmonary Resuscitation Training in I Year MBBS Students

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ABSTRACT

Objective: To evaluate the effectiveness of implementing training session on basic life support (BLS) and cardiopulmonary resuscitation (CPR) on knowledge and awareness in I year undergraduate medical students. **Methods:** This observational study, (one group, pretest and posttest design) was conducted in I year MBBS students. Institutional ethical committee clearance was obtained and written informed consent was taken from each participant. The data was collected after explaining the purpose of the study by the investigator. Both inclusion and exclusion criteria were taken into consideration. A validated questionnaire with 20 questions was asked to be filled up by all the participants before the start of the training (pretest) without revealing identity of the individual and also after conducting small training in CPR (posttest). For both pretest and posttest, the correct response was given 1 point and incorrect response 0 point. Thus the score was in 0-20 range. The results were tabulated in the excel sheet and pre and posttest responses for each parameter was evaluated. The statistical analysis was done using SPSS software version 17 using paired t test. P value < 0.05 was considered as significant and <0.001 as highly significant. **Results:** Out of the total score of 20, the mean score obtained in pretest was 10.384 and for posttest it was 14.40. The total number of correct responses for all individual questions also showed improvement after the short training session. The questions which the participants found it most difficult to answer was the depth of compressions to be given in different age groups and the different maneuvers to be performed when any specific emergency situation is encountered. **Conclusion :** It can be concluded from our study that providing regular training in basic life support and cardio-pulmonary resuscitation to undergraduate medical students can be effectively implemented so as to improve their knowledge about the same. This will not only inculcate the understanding about emergency lifesaving procedures but will also prepare them to face such emergencies that might lead to cardiac arrest in the victim.

KEY WORDS: Basic life support, Cardiopulmonary resuscitation, Knowledge, Medical, Students.

Introduction

Cardiac arrest is an emergency situation incurring at places other than medical institutions also, where the victim becomes totally unresponsive as the cardiac activity ceases. This is true for even the persons without any previously diagnosed underlying cardiac disease. If not intervened on time, it leads to sudden death.

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Most common and effective way of timely intervention is to provide cardiopulmonary resuscitation.^[1] Cardiopulmonary resuscitation (CPR) is a series of steps performed following cardiac arrest and consisting of several coordinated actions.^[2] CPR supports heart pumping and allows oxygen to reach the brain and whole body^[3]. It is more effective if performed as early as possible which increases the likelihood of survival of the victim by two to four times.^[4]

Training in Emergency Medical Services (EMS) is reported to be poor in India.^[5] Research done in this field signifies that there is poor knowledge of basic life support (BLS) among medical undergraduate students.^[6] Usually BLS/CPR is taught in the final year of the medical curriculum in India. According to a study given in world journal of emergency medicine, when the participants were inquired about resuscitation training during graduation, 69% of them had no training at all while 22% had received some training within last 5 years. 23% had not been involved in patient resuscitation.^[7] Classes conducted as a part of the medical curriculum to teach BLS/CPR do not seem to be adequate. Hence it is the need of the hour that proper and regular training should be imparted right from the early years of medical education. With this aim, the present study was planned in order to conduct a training session for the medical students about BLS/CPR during first year of their medical course and to know the impact of the same.

Objectives of the Study

1. To assess the knowledge of medical students regarding BLS/CPR based on standard questionnaire (pretest) as per American Heart Association guidelines 2015.^[8]
2. To demonstrate the basic steps of CPR to the students.
3. To evaluate the effectiveness of implemented training session regarding BLS/CPR based on the above mentioned questionnaire (posttest).
4. To compare the pre and post test scores and evaluate the effectiveness of implementing CPR training sessions.

Material and Method

This observational study, (one group, pretest and posttest design) was conducted in I year MBBS students. Institutional ethical committee clearance was obtained and written informed consent was

taken from each participant and the data was collected after explaining the purpose of the study by the investigator.

Inclusion Criteria

1. Year MBBS students
2. Students willing to participate in study

Exclusion Criteria

1. Students not willing to participate
2. Students who remained absent at the time of the study
3. Incomplete questionnaires

Out of 250 students, 10 remained absent whereas 12 questionnaires were incompletely filled. Hence the actual sample size was reduced to 228.

A validated questionnaire with 20 questions was distributed to evaluate the knowledge of CPR. The aspects on which they were interrogated were: the abbreviation of BLS, CPR and EMS, assessment and resuscitation techniques, etc. The questionnaire was asked to be filled up by all the participants before the start of the training (Pretest) without revealing identity of the individual.

Then a small training session of about 2hrs duration was conducted by the investigator. All the aspects related to the topic was explained by using audio-visual aids like power point presentation for better impact on the participants and small videos were also shown demonstrating the steps of CPR.

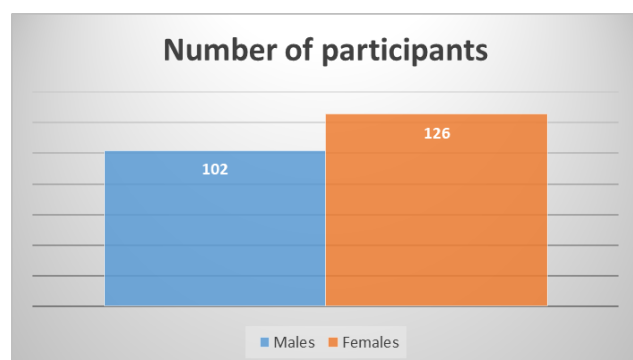
Evaluation of effect of Training: The same questionnaire was asked to be filled up by all participants at the end of training session. (Posttest).

For both pretest and posttest, the correct response was given 1 point and incorrect response 0 point. Thus the score was in 0-20 range.

The results were tabulated in the excel sheet and pre and posttest responses for each parameter was evaluated. The statistical analysis was done using SPSS software version 17 using paired t test. P value < 0.05 was considered as significant and <0.001 as highly significant.

Results

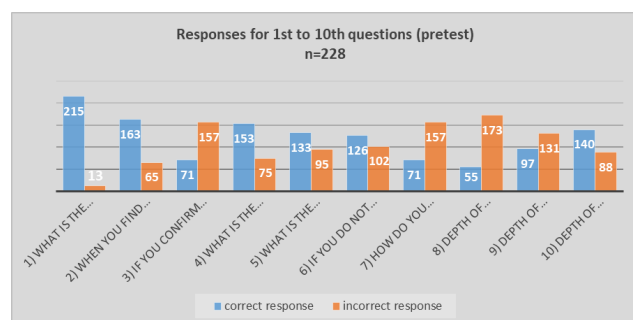
Graph 1 — Shows gender wise distribution of participants (n=228)



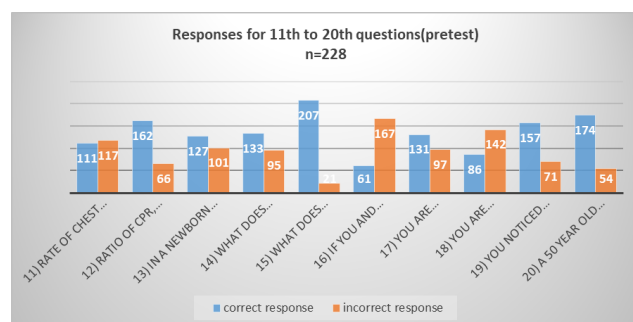
Graph 1: Gender wise distribution of participants

Table 1: Shows the comparison between pretest and posttest score obtained by the participants (Average \pm SD)

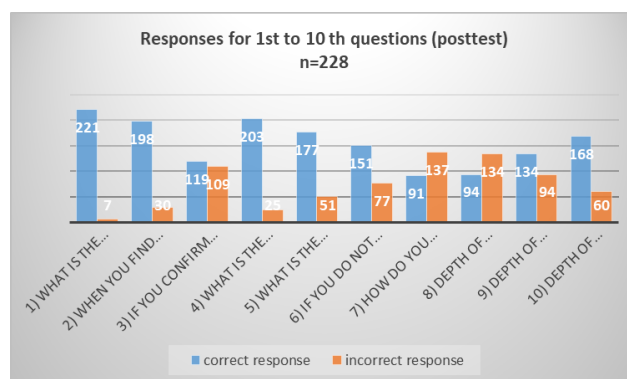
Pretest score (out of 20)	Posttest score (out of 20)	p value
10 \pm 3.84	14 \pm 4	>0.05



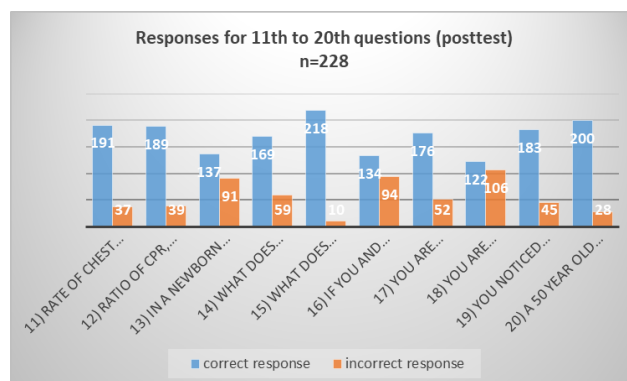
Graph 2: Shows the pretest responses for 1st to 10th questions



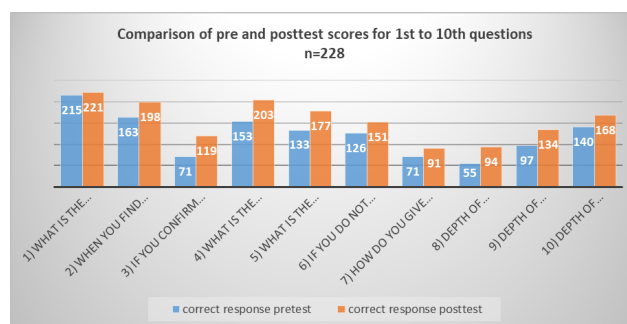
Graph 3: Shows the pretest responses for 11th to 20th questions



Graph 4: Shows the posttest responses for 1st to 10th questions



Graph 5: Shows the posttest responses for 11th to 20th questions



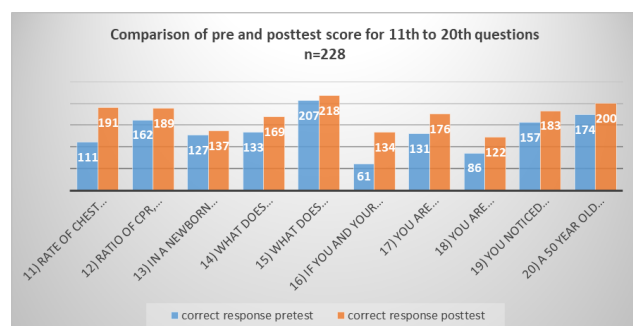
Graph 6: Shows the comparison of pre and posttest scores for 1st to 10th questions

Table 2: Shows frequently missed questions inpretest

Question number	Question	Correct responses	Percentage
8	Depth of compression in adults during CPR	55/228	24
16	If you and your friend are having food in canteen and suddenly your friend starts expressing symptoms of choking, what will be your first response?	61/228	27
7	How do you give rescue breathing in infants?	71/228	31
3	If you confirm somebody is not responding to you even after shaking and shouting at him, what will be your immediate action?	71/228	31
18	You are witnessing an adult unresponsive victim who has been submerged in fresh water and just removed from it. He has spontaneous breathing, but he is unresponsive. What is the first step?	86/228	38
9	Depth of compression in Children during CPR	97/228	43
11	Rate of chest compressions in adult and children during CPR	111/228	49

Table 3: Shows frequently missed questions in posttest

Question number	Question	Correct responses	Percentage
7	How do you give rescue breathing in infants?	91/228	40
8	Depth of compression in adults during CPR	94/228	41

**Graph 7:** Shows the comparison of pre and posttest scores for 11th to 20th questions

Discussion

Regular training sessions of medical staff in basic life support and use of automated external defibrillators is the need of the hour. If this type of training sessions are conducted regularly from early phase of the medical education among medical students, it would definitely improve the quality of resuscitation and would be of importance to society as well, in managing cardiac arrest outside the hospitals also. With this aim the present study was carried out to find out is there any improvement in knowledge about CPR after small training session

in undergraduate (I year) medical students which would definitely aid in planning such in depth sessions in future throughout their curriculum.

In the present study the number of female participants was more (126 out of 228 or 55.26%) as compared to the male participants (102 out of 228 or 44.73%) as shown in Graph 1.

When the mean pretest and posttest scores obtained by the participants (Average \pm SD) was compared, posttest score, though statistically not significant, was found to have definitely improved after the training session as shown in Table 1. These findings are similar to one such study conducted by Alaa O Oteir, in 2019 which showed the mean test score was comparatively more in CPR trained participants compared with the untrained.^[9]

Graph 1 and Graph 2 shows pretest responses of all the participants. From these graphs it is clear that the knowledge about basic life support techniques is really lacking in undergraduate medical students.

Graph 4 and Graph 5 shows posttest responses of all the participants.

When responses for pre and posttest were compared, it showed improvement in the scores in posttest as shown in Graph 6 and Graph 7.

The responses to some frequently missed questions as shown in Table 2 prove that participants had poor knowledge about depth of compression in adults as well as infants. These findings are similar to the findings of one of the studies done by Zeinab Mohammed et al. in the past which showed that the participants had poor knowledge about the depth of compressions to be given in CPR.^[10]

Surprisingly the number of frequently missed questions was reduced in posttest as shown in Table 3. This shows that there is definite improvement in knowledge of participants regarding CPR when they received some form of training. We also got some interesting findings in our study that the participants could not respond correctly to the question based on CPR guidelines asked in different emergency situations encountered in day to day life (Table 2).

The comparison between pre and posttest scores for individual questions definitely shows improvement mentioned in our results. These findings prove that with training, the quality of CPR will certainly be improved. But, as stated in one study by Raymond Farah, having just the knowledge about guidelines and skills of BLS and CPR will not suffice, regular practice sessions should be conducted for all the medical students as well as staff.^[11] And what else is the correct time to start than to implement it in first year undergraduate medical curriculum.

Strength of the study- Many studies have been done in the past to assess the effect of CPR training in medical or paramedical staff, but very few studies are conducted to find the effect of same in undergraduate medical students. Hence, this study will certainly be helpful in designing undergraduate medical curriculum that includes sessions on BLS and CPR.

Limitations of the study- This kind of study should have been done on a larger group of medical students. Also we tested effect of training only on knowledge. It should include testing skills as well.

Conclusion-It can be concluded from our study that providing regular training in basic life support and cardio-pulmonary resuscitation to undergraduate medical students can be effectively implemented so as to improve their knowledge.

Conflict of Interest: Nil

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