Original Article

# Knowledge of Cardiopulmonary Resuscitation Among Interns Working at Kathmandu Medical College

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**ABSTRACT:**

**Background**: Cardiac arrest is a substantial public health problem estimated to account for 15-20% of all death. Cardiac arrest is one of the most common emergencies within the emergency department leading to serious and life-threatening results which can be managed if medical and paramedical personnel working in the emergency department have adequate knowledge about cardiopulmonary resuscitation (CPR) and if they are well trained to administer it effectively.

**Objective**: To assess the knowledge, attitude and practice regarding CPR amongst interns in tertiary medical center of Nepal and comprehend the depth of knowledge about CPR and practice regarding defibrillation used during CPR.

**Methodology**: This is a cross-sectional study carried out in Kathmandu Medical College Teaching Hospital using a semi structured pretested questionnaire. We requested interns to answer the questionnaire, which included 25 questions to assess the knowledge of BLS. Similarly, subjects were inquired about the attitude level questionnaire by the researcher and scoring was done accordingly. We analyzed the statistics through frequency, percentage, mean and mean percent.

**Results**: Out of 150 interns, regarding knowledge, on an average 11.71 questions were correctly answered. Highest score of 22 was scored by five participants and lowest of 5 scored by seven participants. Eleven questions were rightly answered by more than 50%. All the participants agreed that resuscitation training need to be added in the curriculum.

**Conclusion**: The present study identified the attitude score was good however, knowledge score of BLS was poor among medical interns. BLS training should be the part of the MBBS curriculum to solve this very critical issue. The unconsolidated knowledge about resuscitation among the interns is not adequate. This study emphasizes the necessity for standardized systemic resuscitation program in the undergraduate curriculum and effort should be made to introduce an appropriate, efficient and effective course design.

**Keywords**: Cardiac arrest, CPR, Interns, Knowledge, Resuscitation

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## INTRODUCTION:

Cardiac arrests and accidents are the most common emergencies with grave consequences.[1] These emergencies can be managed efficiently by proper knowledge and practice of resuscitation skills. Resuscitation is the art of restoring life or consciousness of one apparently dead. Cardiopulmonary resuscitation (CPR) is a series of lifesaving actions that improve the chance of survival following cardiac arrest.[2] Cardiac arrests can be managed if medical and para- medical personnel working in the emergency department (ED) have adequate knowledge about CPR and the outcome of such events can be significantly impaired if these professionals are not well trained to administer it effectively.

CPR is an emergency procedure that combines chest compressions often with artificial ventilation in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest. It is recommended in those who are unresponsive with no breathing or abnormal breathing, for example, agonal respirations in a person who has sustained cardiac arrest.[1, 2] It is recommended in those who are unresponsive with no breathing or abnormal breathing and no pulse. It is documented that a timely performed CPR can largely prevent sudden death and improve outcome of the patient.[2] The ability to diagnose and treat a respiratory or cardiac arrest is a basic medical skill that all doctors are generally presumed to possess but the fact is that many junior doctors are not competent enough to carry out CPR.[3]

In the case of an emergency, fast and structured patient management is crucial for a patient's outcome.[4] In order to manage common emergencies every medical student and graduate should possess basic knowledge of emergency care and the skills necessary for dealing with these situations.[5] Adequate education in first aid and basic life support (BLS) should be considered as an essential aspect of the medical curriculum.[5] or else when junior doctors encounter a situation where resuscitation is necessary, they fail to perform CPR effectively.[3] Unfortunately structured teaching of BLS/ALS is lacking in medical curriculum. Busy residency schedules and lack of resources act as barrier.[1] There are few studies done worldwide to assess the knowledge of interns regarding CPR.[2] However, similar studies are lacking in our context. Therefore, this study was done to assess the knowledge of interns working in a tertiary care center of Nepal regarding resuscitation so as to evaluate the depth of their knowledge about CPR.

## MATERIALS AND METHODS

This descriptive cross-sectional study was carried out in Kathmandu Medical College and Teaching Hospital (KMCTH) in Kathmandu, Nepal. The study was carried out from February to May 2019. The study subjects included interns who had passed their Bachelor of Medicine and Bachelor of Surgery (MBBS) final examinations and were undergoing compulsory rotatory clinical internship. Each respondent was explained the purpose of the study. Interns who had received BLS/ACLS training/courses/workshop besides their MBBS curriculum separately were excluded from the study. After exclusion, we had total subjects of 150 interns which were included in the study. These interns were requested to answer a questionnaire which comprised of 25 questions and covered varied aspects of resuscitation of pediatric and adult. These interns were also requested to give their opinion on inclusion of resuscitation training as part of MBBS curriculum. After the data was collected, statistical analysis was done by frequency, percentage, mean and mean percent using the Excel and SPSS version 2016.

## RESULTS

A total of 150 interns participated in the study and response rate was 100 percent. The answering pattern showed (Table 1) that question no.1 was correctly answered by maximum number of students i.e., 60.67%. Most interns answered Question No. 24 incorrectly. Eleven questions

(Question no. 1, 5, 9, 11, 12, 14, 15, 19, 20, 21 and 22) were correctly answered by more than 50% of the participants. Questions 1-10 were multiple choice questions and questions 11-25 were structured as Yes, No and Don't Know format.

**Table-1: Answer provided by the participants**

| SN | Responses | Correctly answered (n=150) | Responses Percentage |
|---|---|---|---|
| 1 | The main purpose of CPR is to maintain cardiac output to keep vital organs alive | 91 | 60.67% |
| 2 | The BLS steps for adults are to assess the individual, activate Emergency Medical System (EMS) and get Automated External Defibrillator (AED), check pulse and respiration simultaneously and start CPR | 63 | 42% |
| 3 | The 2015 AHA guidelines for CPR steps are chest compression, airway and breathing | 59 | 39.33% |
| 4 | The recommended compression to ventilation ratio for one rescuer CPR for individuals of any age is 30:2 | 63 | 42% |
| 5 | The critical characteristic of high-quality CPR includes chest compression within 10 sec of recognition of cardiac arrest, pushing hard and fast and minimizing interruptions | 75 | 50% |
| 6 | After delivering a shock with an AED, the next step in BLS is to resume CPR | 58 | 38.67% |
| 7 | While performing CPR breath checking should not last more than 10 seconds | 57 | 38% |
| 8 | Compression only CPR should be done if there is hesitation in performing mouth to mouth ventilation | 58 | 38.67% |
| 9 | If the child ingests some coins, turns blue and is unable to cry or breathe, 5 back blows and 5 chest thrusts should be delivered | 84 | 56% |
| 10 | If the victim is choking use abdominal thrust | 50 | 33.33% |
| 11 | Knowledge of correct CPR procedure is mandatory to all working in a hospital | 77 | 51.33% |
| 12 | Bystander CPR is a basic lifesaving procedure in an emergency situation | 77 | 51.33% |
| 13 | All health professionals should participate in CPR awareness program and have lifesaving experience | 72 | 48% |
| 14 | CPR procedures are not arduous, unethical, incorrect and purely inhuman | 85 | 56.67% |
| 15 | Teaching and mastering CPR intervention should be made mandatory to all medical undergraduates | 80 | 53.33% |
| 16 | CPR is an emergency procedure which is attempted in an effort to return life in cardiac arrest | 70 | 46.67% |
| 17 | CPR can be attempted anywhere | 52 | 34.67% |
| 18 | Artificial respiration are more appropriate than CPR if a person is not breathing but has palpable pulse (Respiratory arrest) | 74 | 49.33% |
| 19 | The brain may sustain damage after blood flow has been stopped for about 4 mins and irreversible damage after about 7 mins | 85 | 56.67% |
| 20 | CPR is generally continued until the person regains return of spontaneous circulation or is declared dead | 76 | 50.67% |
| 21 | Defibrillator is an electrical device used as shock to the heart and needed to restore a viable or "perfusing" heart rhythm | 85 | 56.67% |
| 22 | Compression – only CPR by the lay public is recommended to an adult having cardiac arrest out of hospital | 76 | 50.67% |
| 23 | The survival rate is very high if immediate CPR is done followed by defibrillation within 3-5 mins of sudden Cardiac arrest | 70 | 46.67% |
| 24 | Compression only CPR is less effective in children than in adults, as cardiac arrest in children is more likely to have a non-cardiac cause | 50 | 33.33% |
| 25 | It is always better to be calm and contented while conducting CPR rather than look frightened | 70 | 46.67% |

**Table2: Distribution of participants according to the scores**

| Grades | Scores | n=150 | % |
|---|---|---|---|
| Very poor | Less than 5 | 7 | 4.67% |
| Poor | 5-9 | 20 | 13.33% |
| Moderate | 10-14 | 69 | 46% |

| | | | |
|---|---|---|---|
| Good | 15-19 | 49 | 32.67% |
| Very Good | More than 20 | 5 | 3.33% |

On an average 11.71 questions were correctly answered. So, the level of knowledge is 11.71 with % mean of 46.84 which indicates inadequate knowledge among interns. None of the participants correctly answered all the questions. Highest score of 22 was achieved by 5 and lowest of 5 achieved by 7 (Table 2). Each right answer was assigned one score.All the participants in the study agreed that structured resuscitation training should be added in the curriculum.

## DISCUSSION

BLS refers to maintaining an airway and supporting breathing and circulation without using any equipment. Each individual in a community should know the importance of BLS in saving lives and improving the quality of community health.[9]

BLS is the foundation for saving lives after cardiac arrest. Fundamental aspects of adult BLS include immediate recognition of sudden cardiac arrest and activation of the emergency response system, early CPR, and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS.[6]

In our study, the theoretical knowledge of Cardiopulmonary resuscitation was found very poor, among the 150 interns of tertiary care hospital only about 11percents of respondents were able to answer all the 25 questions correctly. Similar study was carried out which revealed that the theoretical knowledge of cardiopulmonary resuscitation of 50 junior hospital doctors was examined, and an attempt made to assess their practical ability to manage a collapsed patient. Major defects were found in both the doctors' theoretical knowledge and their practical abilities. Only 8% were able to manage a cardiopulmonary arrest adequately. [7] Though our study did not observe the practice of the respondents the findings of the knowledge score is similar to our study. There is no any doubt about the importance of cardiopulmonary resuscitation. A study in the United States also demonstrated that only 29% of junior doctors could satisfactorily compress and ventilate a manikin-that is, they are able to perform basic life support.[8] It is very vital for all medical personnel to timely recognize cardiac arrest, as early and effective delivery of CPR can double or triple the patients' chances of survival. [10, 11] The sequence of BLS steps has been changed in the 2010 AHA guidelines for CPR from ABC (Airway, Breathing and Chest Compression) to CAB (Chest Compression, Airway and Breathing.[12]

In our study only 39.33% were found correct regarding the ABC to CAB changes in BLS sequence and 42% correctly answered that the BLS steps for adults was to assess the individual, activate EMS and get AED, check pulse and respiration simultaneously and start CPR. The change in the sequence was made by AHA because cardiac arrest is due to VF or pulse less VT and the critical elements for these are chest compressions and early defibrillation.[2] In our study only 42% were correct regarding the compression ventilation ratio and 50.67% knew about compression only CPR.

It is found that CPR plus early delivery of shock with a defibrillator within 3 to 5 min collapse can provide survival rates as high as 49 to 75%. [13, 14] In our study 56.67% correctly answered that the brain may sustain damage after blood flow has been stopped for about 4 minutes and irreversible damage after about 7 minutes and 46.67% acknowledged that survival rate is very high if immediate CPR is provided followed by defibrillation within 3-5 minutes of sudden cardiac arrest. In this study 56.67% knew about defibrillators and 38.67% were correct that the next step in BLS is to resume CPR after delivering a shock with an AED.

Effective CPR can only be administered if it is delivered with proper technique and in our study 50% knew about the critical characteristics of

high-quality CPR and in another question regarding the time duration of breath checking while CPR, only 38% answered it correctly. 51.33% said that the knowledge of correct CPR procedure is important for all healthcare professionals and this data exhibits the lack of awareness regarding CPR amongst healthcare professionals. Our study also included questions to assess knowledge regarding choking and artificial respiration but the data showed that the overall knowledge regarding resuscitation among interns was bleak.

Interns have scattered knowledge about resuscitation and pattern of responses show that no question was uniformly found difficult. A study done in Pakistan among 61 medical students showed some scattered knowledge about BLS. [15] A larger study done in South India concluded that awareness of BLS among students, doctors and nurses of medical, dental, homeopathy and nursing colleges is very poor. [16]

Nepal lacks standardized systemic resuscitation program in the undergraduate curriculum. Doctors still are expected to learn resuscitation skills in the clinical setting, where there is little opportunity to correct poor techniques.[17] Busy schedule of doctors, lack of resources and proper training regarding CPR in undergraduate curriculum contributes in making many interns not competent enough in carrying out effective cardiopulmonary resuscitation.

In our present study, all the respondents expressed the importance of the CPR training during their interns. Similar report was presented by the General Medical Council of UK states that pre-registration house officers should have training in basic life support before they begin their first post and that they should receive advanced life support training during the first year. [11]

## CONCLUSION

The knowledge score of CPR was found poor among interns of Kathmandu Medical College. The knowledge regarding resuscitation among interns is not adequate. As a result, introduction of standardized systemic resuscitation program in the undergraduate curriculum is of crucial importance. An effort should be made to determine an appropriate and efficient course design for interns.

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