



## EFFECTIVENESS OF BASIC LIFE SUPPORT SKILL TRAINING PACKAGE FOR MEDICAL INTERNS IN A TEACHING HOSPITAL IN KERALA

**Althaf A**

Department of Community Medicine, Government Medical College, Manjeri.

**Retheesh K H\***

Department of Community Medicine, Government Medical College, Thiruvananthapuram. \*Corresponding Author

**Suni K Akbar**

Department of Pediatric Nephrology, Government Medical College, Thiruvananthapuram.

**ABSTRACT** The study was aimed to assess the basic life support skills of interns in a tertiary care teaching hospital in Kerala and to evaluate the effectiveness of a skill training package in improving their cognitive skills.

**Methods:** 92 medical students who have recently completed their internship were enrolled in this interventional study. Each skills training session consists of a six-stage process comprising the pre-test, tutor demonstration, followed by explanation, hands-on training practice under supervision and the post-test. Pre and post tests were carried out to assess the basic life support skills of participants.

**Results:** The overall mean test score improved significantly from 1.88 (SD 1.9) in the pre-test to 9.15 (SD 0.85) in the post-test ( $p < 0.000$ ). McNemar Chi square test was used to compare the critical performance and find the effectiveness of the training package.

**Conclusion:** The pre-test assessment of basic life support skills of the participants revealed the critical lacunae in our medical curriculum. The training package on basic life support skills is highly effective in improving the basic life support skills of medical interns.

**KEYWORDS :** Basic life support, BLS skills, high quality cardiopulmonary resuscitation, emergency response system, bag-mask ventilation

### INTRODUCTION

Sudden cardiac arrest refers to an unexpected event from a cardiovascular cause that occurs rapidly within or outside the hospital. Basic Life Support (BLS) or high quality cardiopulmonary resuscitation (CPR) is a simple life-saving protocol following a cardiac arrest. It is an integral part of emergency resuscitative care that aims to retain sufficient ventilation and circulation until the cause of the arrest is detected and eliminated. Patients who receive BLS following the event have a higher survival rate than who did not receive it in time (1).

Competency in providing immediate life support and CPR is a prerequisite for all general medical practitioners across the world. Goal of medical education across world is to prepare students to become clinically competent doctors. However, there is a growing concern about the lack of emphasis placed on teaching and reinforcing BLS skills within the medical school curriculum. In a changing scenario of health where demographic and epidemiologic transitions were occurring at a pace faster than the ability of health personnel to cope with, we have to acknowledge the inappropriateness of the current health education and delivery systems.

In this context, it becomes essential to assess the competency of our interns and equip them in delivering critical care and there is an urgent need to develop a training package to improve their skills to impart effective life-saving resuscitation. This study was aimed to assess the basic life support skills of interns in a tertiary care teaching hospital in Kerala and to evaluate the effectiveness of a skill training package in improving their cognitive skills.

### MATERIALS AND METHODS

A total of 92 medical students who have recently completed their internship were enrolled in this interventional study conducted at Government Medical College, Thiruvananthapuram.

We have conducted a trainers' workshop for residents and junior faculties in the community medicine department, they were later assigned as faculty in the training sessions and these trainers facilitated skill training sessions and managed the skill stations. We conducted a total of 9 skill training sessions for interns, each with a maximum of 10 or 11 participants and four faculties. Each skills training session consists of a six-stage process comprising the pre-test, tutor demonstration, followed by explanation, hands-on training practice under supervision and the post-test totaling a duration of 7-8 hours.

After a 5-minute introduction, the participants had to complete the pre-test. The students then worked individually with the CPR tutorial for a total of 3 hours including a 20-minute break. The participants then had to complete the post-test within the stipulated time. The students did not have access to the tutorial during the tests. Sessions were

monitored by trained faculty in order to resolve technical issues and to gather data on the participants' use of the tutorial. The pre-posttests were conducted in mannequins in the manned skill stations designed to determine the interns' skills. The BLS skills were assessed using BLS checklist based on the American Heart Association adult BLS algorithm (2).

There were two phases in this basic life support skills testing. First is to evaluate the rescuer's ability to initiate BLS and deliver high-quality CPR and then to evaluate the rescuer's ability to give breaths with a bag mask in which the rescuer is expected to successfully deliver 2 breaths with the bag mask.

### Critical Performance Criteria

Adult BLS skills testing sheet used in pre and post-tests have the following steps.

Steps to evaluate the rescuer's ability to initiate BLS and deliver high-quality CPR

1. Initial assessment: checks for response and for no breathing or no normal breathing, only gasping – look, listen and feel approach (at least 5 seconds but no more than 10 seconds)
2. Activates emergency response system (ERS)
3. Checks for pulse (no more than 10 seconds)
4. Correct compression: hand placement to give high quality CPR
5. Adequate rate: at least 100 per minute (i.e. delivers each set of 30 chest compression in 18 seconds or less)
6. Adequate depth: delivers compressions at least 2 inches (5-6 cm) in depth (at least 23 out of 30)
7. Allows complete chest recoil (at least 23 out of 30)
8. Minimizes interruptions: gives 2 breaths with bag-mask in less than 10 seconds.

Steps to evaluate the rescuer's ability to give breaths with a bag mask. Rescuer to successfully deliver 2 breaths with bag mask

9. Proper seal: head tilt and chin lift and E-C clamp technique
10. Chest raises following the bag-mask ventilation

If the student completed all steps of critical performance criteria successfully, the student is considered to have adequate skill. If the student was unable to complete all steps of critical performance criteria successfully, the test form was given to the student for review as part of the students' remediation.

### RESULTS AND DISCUSSION

The aim of this work was to determine the effectiveness of increased use of skill-mix in the medical internship training. Table shows the pre and post-test scores of the participants.

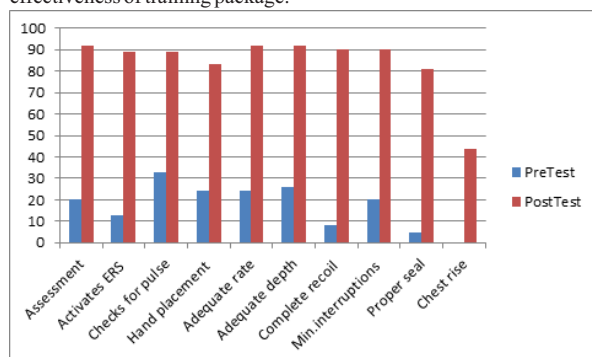
**Table 1 - Critical Performance Criteria**

Steps	Pretest (%)	Posttest (%)	*p
Initial assessment	20 (21.7)	92 (100)	a
Activates ERS	13 (14.1)	89 (96.7)	.000
Checks for pulse	33 (35.9)	89 (96.7)	.000
Hand placement	24 (26.0)	83 (90.2)	.000
Adequate rate	24 (26.0)	92 (100)	a
Adequate depth	26 (28.2)	92 (100)	a
Complete chest recoil	8 (8.7)	90 (97.8)	.000
Minimum interruptions	20 (21.7)	90 (97.8)	.000
Proper seal of bag-mask	5 (5.4)	81 (88.0)	.000
Chest rise	0 (0)	44 (47.8)	a

\*McNemar Chi square

a - Cells with no frequency

The pre- and post-test results showed the training package had significant impact in improving the resuscitation skills of interns. The overall mean test score improved significantly from 1.88 (SD 1.9) in the pre-test to 9.15 (SD 0.85) in the post-test ( $p < 0.000$ ). McNemar Chi square test was used to compare the critical performance and find the effectiveness of training package.

**Fig. 1 - Comparison Of Critical Performance**

The influence of adequate knowledge on the accuracy and quality of CPR has been shown in various studies (3). In our study, the pre-existing knowledge of interns regarding the basic life skills was less, prior to participation in the BLS workshop.

In a study conducted in a tertiary care hospital in South India among the undergraduates and postgraduate medical, dental and nursing students, also stressed the need to include basic life support training at all levels as the awareness among students was below average (4). In a similar study analyzing the BLS knowledge among medical and paramedical staff reported that only 3 out of 117 participants had secured 80-90% marks in pretest and post workshop assessment showed 70% candidates securing more than 80% (5). In our study, none out of the total 92 participants has had sufficient score in the pre-test and 36 out of 92 participants secured 100% in post-test, thus indicating the effectiveness of the BLS workshop in enhancing the preexisting knowledge among the participants.

Sushma Pande et al in their study to evaluate retention of knowledge and skills imparted to first-year medical students through basic life support training if BLS skills, has recommended that BLS skills be learnt right from the first-year medical curriculum along with the basic sciences of the cardiovascular and respiratory systems, followed by reinforcement of the skills every year thereafter, which would lead to a more fruitful outcome (6).

## CONCLUSION

The pre-test assessment of basic life support skills of the participants revealed the critical lacunae in our medical curriculum. The training package on basic life support skills is highly effective in improving the basic life support skills of medical interns. Medical students and interns should receive basic life support training as part of their curriculum and the competency assessed on a regular basis.

## REFERENCES

1. Sanghavi P, Jena AB, Newhouse JP, Zaslavsky AM. Outcomes after out-of-hospital cardiac arrest treated by basic vs advanced life support. *JAMA Intern Med.* 2015; 175(2):196-204. doi:10.1001/jamainternmed.2014.5420
2. Monica E. Kleinman, Erin E. Brennan, Zachary D. Goldberger, et al. 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *3 Nov 2015 Circulation.* 2015; 132:S414-S435
3. Isbye DL, Meyhoff CS, Lippert FK, Rasmussen LS. Skill retention in adults and in

children 3 months after basic life support training using a simple personal resuscitation manikin. *Resuscitation.* 2007 Aug; 74(2):296-302

4. Akshatha Rao Aroor, Rama Prakash Saya, Nazir Rahim Attar, Ganesh Kumar Saya and Manikandan Ravinanthan. A awareness about basic life support and emergency medical services and its associated factors among students in a tertiary care hospital in South India. *J Emerg Trauma Shock.* 2014 Jul-Sep; 7(3): 166-9
5. Asmita Chaudhary, Heena Parikh and Viral Dave. Current Scenario: Knowledge of Basic Life Support in Medical College. *Natl J Med Res.* 2011; 1(2): 80-2
6. Sushma Pande, Santosh Pande, Vrushi Parate, Sanket Pande, Neelam Sukhohale. Evaluation of retention of knowledge and skills imparted to first-year medical students through basic life support training. *Advances in Physiology Education* Mar 2014, 38(1) 42-5