

# Impact of basic life-support training on final MBBS Students

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## I. Introduction

Cardiac arrest is a major public health issue and a cause of mortality worldwide. Higher rates of survival have been seen when cardiac arrests are witnessed.<sup>1,2</sup> Survival can even be three times higher when cardiac arrests are attended by persons able to provide immediate resuscitation.<sup>2</sup> However, only a minority of cardiac arrest victims receive potentially lifesaving bystander cardiopulmonary resuscitation (CPR), thus indicating the need for improvement in resuscitation education.

Resuscitation science is very complex and has its own features depending on the country and culture wherein it is applied. Resuscitation education is primarily focused on ensuring widespread and uniform implementation of resuscitation science, during practice by healthcare CPR providers, to achieve the best possible performance of CPR skills.

The basic knowledge of BLS plays a very important role in determining the success of resuscitation following cardiac arrest. This in turn shall increase survival rate as well as reduce post arrest morbidity. BLS requires adequate knowledge and skills to provide efficient chest compression, ventilation and defibrillation. The lack of training and inability to cope with medical emergencies can lead to tragic consequences and probable legal hazards. BLS is a simple and effective procedure if the skill required is maintained by frequent training. These final year under-graduates are future Interns, post graduate students and may be directly handling several patients in the emergency department so it would be wise to make them well-equipped with BLS training before they become certified practitioners.

The final year medical undergraduates will be able to perform effective BLS confidently with thorough knowledge of diagnosis and treatment of sudden cardiac arrest.

**Key words:** Cardiac arrest, Basic life support, mortality, cardiopulmonary resuscitation

## II. Aims & Objectives

1. Aim of our study was to assess the preliminary knowledge about Basic life support in final year undergraduates, and establish the need of refresher courses of the same at regular intervals.
2. Objective of our study was to train the final year undergraduate students in the basic knowledge and skills of BLS, and assess the same, before they enter the medical fraternity as graduates.

## III. Methodology

We conducted this study in a tertiary health centre after necessary permissions from the Dean of the medical college and the institutional ethical committee. 60 students from eighth semester were explained about this educational project and their willingness to participate was taken as consent.

Actual Training was divided in to two halves, a morning session and an afternoon session. In the morning session, first a pre test was conducted using a questionnaire consisting of 25 basic questions regarding the protocols of Basic life support, formulated by the AHA (American Heart Association). The faculty (one of whom is a BLS instructor and two are BLS providers, certified by the American Heart Association) then gave training to students regarding BLS by didactic lectures and audio visual sessions. This training was then followed by the same questionnaire as post test, to see how much difference the BLS training had made in the understanding of students about BLS.

The evening session consisted of hands on training where students were divided into four groups of 15 each, and were first given a demonstration of chest compressions on manikin, bag and mask ventilation on the manikin, and use of AED (Automated external defibrillator). The demonstration was then followed by hands on training to each and every student, on the manikins.

Following the demonstration and hands on training session, a skill assessment test was done, where in students were asked to demonstrate steps of BLS as per protocol and points were allotted for each correct step performed.

The assessment was made under the following headings:

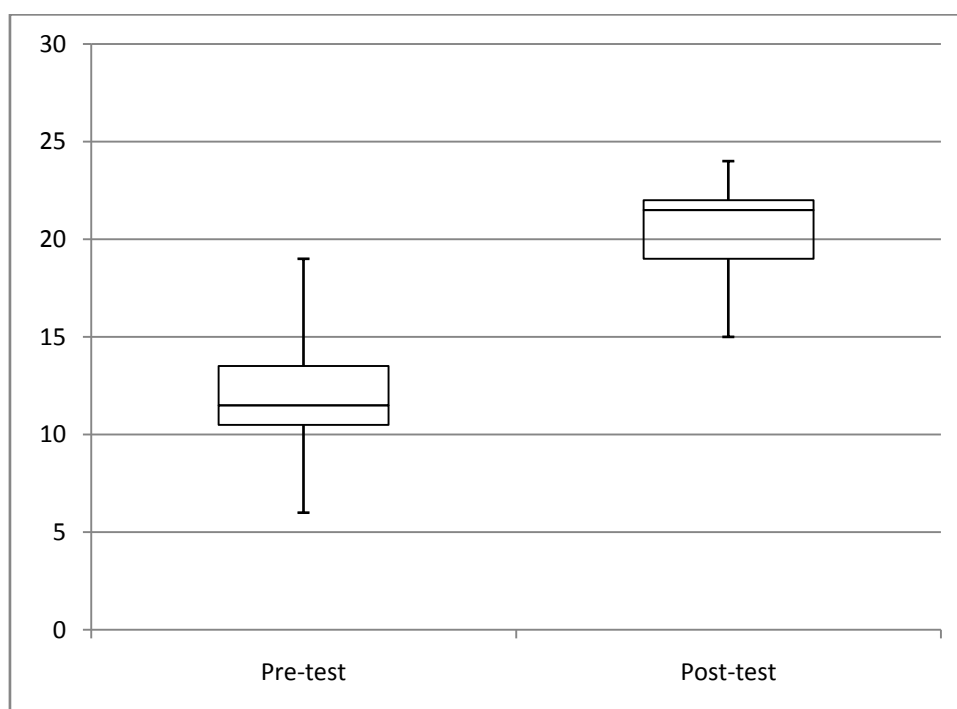
1. Assessment and activation
2. Chest compressions
3. Ventilation
4. AED

The students were then given a feedback for to rate their experience in terms of overall satisfaction about the teaching and demonstration methods and their confidence level in performing BLS independently.

The obtained data was presented as tables and diagrams wherever necessary and discussed. The data was statistically analysed using percentage distribution, and appropriate parametric or non-parametric statistical tests of significance.

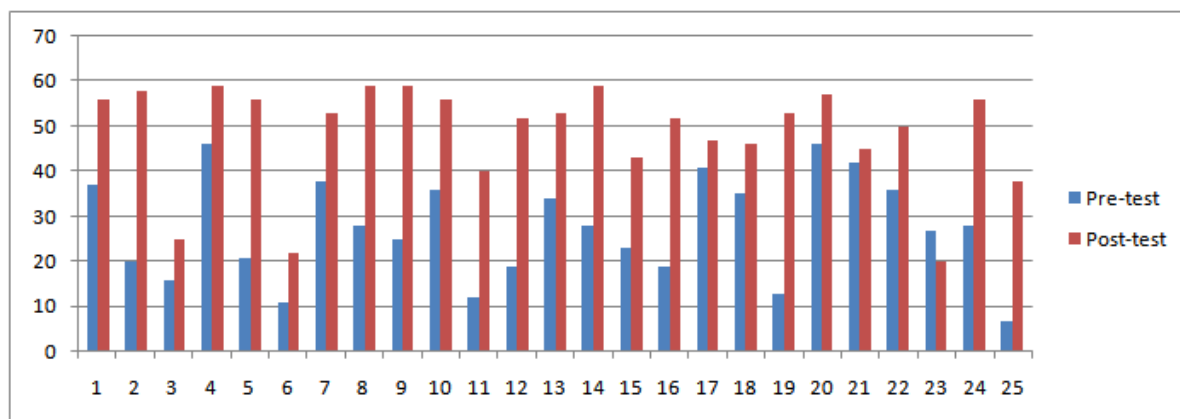
#### IV. Observation And Results

1. Following is a Box and Whisker's plot----- representation of the marks obtained by students in the pre-test and post-test. The third percentiles for pre-test are in the range of 11 – 14 while those for post-test are in the range of 21-23. As can be seen from the figure, the lowest percentile for post test is higher than highest percentile for pre-test.



2. In pre-test 75 % students scored less than 50 % marks but in post test all of them were above 60 %. The mean value for pre-test is 11.75862 with a standard deviation of 1.233657, while the mean value for post-test is 22.57627 with a standard deviation of 3.870088. The difference is statistically significant with a p value of <0.00001. Only 1.7% students scored >75% marks in pre-test while 85% students scored >75% marks in post-test which is a statistically significant difference. ( P =<0.00001)

	Pre-test	Post-test
<b>Mean</b>	11.75862069	20.57627119
<b>Standard Deviation</b>	1.233657089	3.870087829



(The chart below depicts the question number on the X-axis and marks obtained on the Y-axis.)

3. In the assessment done after demo and hands on training, the checklist consisted of 23 questions. Of the 60 students, 55 students scored 23 / 23, while 5 students scored 22/23. Thus, 92% students scored 100% while 8 % scored 96%.

4. 100% students felt that they are confident to use the skills taught in the course and will be able to use the skills to respond in an emergency situation. (Feed back)

## V. Discussion

There are many studies done previously on medical undergraduates (mainly first and second year students) for testing BLS knowledge<sup>1</sup>, retention of knowledge<sup>2</sup>, attitude towards it etc. In most of the studies BLS is introduced to first year undergraduates<sup>3</sup>.

The introduction to BLS occurs in the first year in the current undergraduate curriculum. However, we wanted to test final year students for their knowledge of BLS and the skills in actually performing BLS before they become interns or postgraduate students.

We conducted a training session for 60 students of eighth semester.

In the morning session, first a pre test was conducted using a questionnaire consisting of 25 basic questions regarding the protocols of Basic life support, formulated by the AHA (American Heart Association). This was followed by didactic lectures and audio visual sessions about BLS. Then the same questionnaire was given to the students as post-test. This was followed by a session of demonstration and hands on training, followed by a skill assessment est. Feedback forms were filled by all students to get an idea of the level of confidence and satisfaction perceived by them at the end of the training.

In our study, in the pre-test 75 % students scored less than 50 % marks but in post test all of them were above 60 %. This indicates a definite improvement in the level of understanding of the protocols of BLS following the audio visual and didactic lecture sessions.

As per the results , the difference in the pre-test and post-test marks is statistically significant though 59 % students had already taken this course previously emphasizing the volatile nature of the subject and the need of refreshing the knowledge and skills of BLS at regular intervals.

In our study the mean value for pre-test is 11.75862 with a standard deviation of 1.233657, while the mean value for post-test is 22.57627 with a standard deviation of 3.870088. The difference is statistically significant with a p value of <0.00001.

In a study conducted by Christina George, Vinimol Jacob et al titled Basic Life Support Training among Interns and Post Graduate Entrants—Any Difference in Level of Education.....?<sup>1</sup>, they assessed the interns and the post graduate entrants on their knowledge and skills in a pre-test questionnaire and compared the scores after undergoing the BLS course as a post-test questionnaire. In the interns group, the pretest score was 12.33+2.710. and the post-test score was 18.34+ 2.081. The difference was significant (p<0.001). Similarly, the post-test scores were 20.04+2.154 compared to pre-test scores of 12.65+2.60 among the post graduate entrants. The difference was statistically significant (p<0.001).

In a study conducted by HALIL IBRAHIM DURAK et al titled Basic life support skills training in a first year medical curriculum: six years' experience with two cognitive–constructivist designs<sup>3</sup>. The results of this study suggest that in the first year of the medical curriculum, at the skills laboratory, in the frame of the structured, outcome-focused, cognitive apprenticeship model adopted, 9 hours theoretical (lecture, BLS algorithm discussion) and 12–20 hours long practical training with a 12–17 students tutorial group, medical students can develop sufficient knowledge and skills to competently perform BLS skills on the manikins and their peers at the end of training.

After the demo and hands on training, the score was 23/23 for 55 students while it was 22/23 for 5 students, indicating that the hands on training was effective in training the students properly in a practical manner.

Raluca Oana Tipa<sup>5</sup> et al conducted a study titled Importance of basic life support training for first and second year medical students—a personal statement. They concluded that understanding BLS courses and more than that practicing these techniques is by far the most challenging task confronting first aid. Either by theoretical classes, practical training or virtual e-education, basic life support techniques must be acquired as soon as possible in medical school, because their core meaning is that of saving a life, the main reason why all students chose the medical profession.

In our study, we conducted a feedback at the end of entire session. 100% students were satisfied with the teaching, the methods used for teaching, the demonstrations and hands on training, and felt that this training had made them confident in giving BLS in a situation that demanded so.

In a study conducted by Christina George, Vinimol Jacob et al titled Basic Life Support Training among Interns and Post Graduate Entrants—Any Difference in Level of Education.....?<sup>1</sup>, they took a feedback from the students on how they felt about the course. Majority, in both groups found the basics easy to understand, got adequate hands-on experience, and gathered knowledge on BLS during the course training. On being asked how confident they were after the course, the post graduate entrants strongly agreed compared to the interns who simply agreed ( $p < 0.001$ ) and the difference was significant. Regarding how organized the course was, two interns felt it was disorganized compared to none among the postgraduate entrants ( $p < 0.001$ ) On subjects of scientific explanations and clarifications significant number of interns simply agreed compared to none among the post graduates ( $p < 0.001$ ) Majority of the post graduate entrants strongly agreed on aspects of scientific explanations, clarifications and course complexity .

In a study conducted by Awais Ahmad et al<sup>7</sup>, titled ‘Knowledge of basic life support among the students of Jazan University, Saudi Arabia: Is it adequate to save a life?’, they concluded that, the outcome and prognosis of cardiac arrest can be significantly improved by the timely administration of BLS/CPR. BLS/CPR is an important part of first-aid training.

In a study conducted by Shahabe A. Saquib et al<sup>8</sup>, titled Knowledge and Attitude about Basic Life Support and Emergency Medical Services amongst Healthcare Interns in University Hospitals: A Cross-Sectional Study. Their conclusion was that, based on the facts received from the study the healthcare interns from the university hospital acquire average awareness and below average knowledge of BLS. Despite having a good attitude toward BLS training, some of the participants have never received BLS training. This issue needs immediate attention to resolve the barriers for not receiving the training. It is recommended that the BLS training program should not only be included in the university curriculum of all healthcare faculties but also be updated at regular intervals.

Overall, we found that there is lack of adequate knowledge about BLS among undergraduate medical students of Final MBBS. The lack of knowledge is due to lack of frequent training.

The undergraduate students are interested in learning BLS if it is made a part of curriculum. They should be trained in BLS before they pass out and start practicing as certified doctors, as BLS is a very essential and life saving measure. In the feedback forms that were filled by the students after the training, 100% students felt that they are confident to use the skills taught in the course and will be able to use the skills to respond in an emergency situation. The students themselves expressed the need of frequent hands-on refresher courses of BLS to retain the knowledge and skills.

## **VI. Conclusion**

We found that there is a lack of basic knowledge and training about Basic Life Support in final year undergraduate students, inspite of having received a training in the first year, and this was reflected in their pre-test results.

There was a significant improvement in the knowledge and skills of the students after training that included audiovisual lectures and hands on training on manikins, which was reflected in the post test (for knowledge) and check list assessment (for skills). The feedback given by the students also reflected the need for regular refresher courses to reinforce and retain the acquired knowledge and skills.

As such, introducing BLS training earlier in the MBBS curriculum, and refreshing the knowledge by regular refresher courses in the need of the hour.

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