

ORIGINAL ARTICLE

Effect of Basic Life Support Training on Hospital Staff of a Tertiary Care Hospital: A Cross-Sectional Analytical Study

Fuad Ahmad Siddiqi, Umer Naseer*, Abdul Rehman Arshad, Wasif Anwar, Saad Aziz, Hafiz Yasir

ABSTRACT

Objective: To ascertain the benefit of a standardized Basic Life Support (BLS) workshop on the different health care cadres in hospitals.

Study Design: Cross-sectional analytical study.

Place and Duration of Study: The study was carried out at the Medicine Department of Medicine of Combined Military Hospital, Peshawar, Pakistan, from November 2021 to May 2022.

Materials and Methods: A hundred individuals participated in the study, including house officers, residents and paramedical staff. It was done through convenient sampling. After consent, their knowledge before the start of the workshop was evaluated through pretest self-structured questionnaires formulated by the American Hearts Association accredited trainers. Afterwards, they underwent a Basic Life Support workshop conducted as per American Heart Association (AHA) standards. At the end of the workshop, they were evaluated by post-test questionnaires. The demographic data of all individuals, including age, gender, education status and designation, was recorded. Data were analyzed through SPSS version 21. Paired T-test was applied. A *p* value of 0.05 or less was considered statistically significant at the start of the study.

Results: The individuals comprised 55 males and 45 females. It included residents, house officers and paramedical staff with mean ages of 27.86 ± 1.17 years, 24.08 ± 0.28 years and 30.56 ± 2.90 years, respectively. Residents had better pretest scores than house officers and paramedical staff (*P* value < 0.001). There was statistically significant improvement in the scores of all individuals (*P* value < 0.001).

Conclusion: BLS workshops have helped improve the knowledge of the hospital staff regardless whichever medical offshoot. Residents had better pretest scores, but house officers improved posttest scores the most.

Keywords: Basic Life Support, House Officers, Paramedical Staff, Residents, Workshop.

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Introduction

Basic life support (BLS) and Cardiopulmonary resuscitation (CPR) is an art of healing that has evolved over centuries to what it has shaped into. The history goes back as sixteenth century when a Swiss physician first used the Bellows method for resuscitation. In 1732, Tossach, a local surgeon in

Scotland used mouth-to-mouth for the first time to successfully revive a miner.¹ In 1740, the Academy of Science in Paris officially recommended mouth-to-mouth resuscitation for reviving drowning victims.² From 18th to 20th century, Hall and Silvester methods were the most commonly used methods of artificial respiration.³ James Elam and Peter Safar further reiterated the mouth-to-mouth resuscitation method in 1956.⁴ The very next year, United States military adopted the same methods to revive unresponsive victims.⁵ In 1960, American Heart Association adopted chest compression with mouth-to-mouth resuscitations and hence, became the forerunners of CPR training in general.⁶ After the request made by the American National Red Cross and other agencies, The National Research Council of

Department of Medicine
Combined Military Hospital (CMH), Peshawar, Pakistan

Correspondence:

Dr. Umer Naseer

Department of Medicine

Combined Military Hospital (CMH), Peshawar, Pakistan

E-mail: drumernaseerch@gmail.com

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the National Academy of Sciences organized a conference in 1966 with a view to devise a organized and standard CPR training plan for general public.⁷ In Seattle, the first ever mass CPR training program was started in 1972 by Leonard Cobb in which he was able to train around 100,000 individuals in a span of the first two years.⁸ Currently, the program has even stepped further to involve more and more bystanders in chest compressions in case they have witnessed an arrest.⁹

Around 30 % of cardiac arrests occur outside hospitals while around 70% of the same events occur within hospital settings in Pakistan.¹⁰ These events need an urgent response in the form of early recognition of the event, activation of Emergency response team, early CPR and delivery of shock etc. The performance of BLS encompasses various aspects of the art of resuscitation which includes safety of self and the patient, recognition of arrest, call for help, high-quality CPR (push hard and push fast), mouth-to-mouth ventilation, use of Automated Electric defibrillator etc. further program also educates and trains the revival process based on the presence of the number of rescuers, which ultimately leads us to learn and practice single-rescuer and two rescuer CPR. Hence, education, repetition of knowledge at regular intervals and its constant focused practice can help the hospital staff to be ready all the time in case such event is encountered during their duty. This program ensures that essentials of CPR, its purpose and the art of execution are perfected through constant practice. Moreover, it imparts confidence in the hospital staff to perform high quality CPR and coordinated Breaths which maximizes the chance of survival. The purpose of this study was to ascertain the benefit of BLS workshop for different cadres of health care providers working at a hospital and compare it among themselves through tangible parameters.

Materials and Methods

It was a cross sectional analytical study done at Medicine Department of Combined Military Hospital, Peshawar, Pakistan from November 2021 to May 2022 over a span of six months. The sample size was calculated using OpenEpi web Software which came out to be 73 while keeping the confidence interval at 95% and anticipated percentage frequency of 5% in the population based

on a study regarding the average incidence of cardiac arrest reporting in ER departments of hospitals in the country.¹¹ Hence, the final data was collected from about 100 people. Individuals were selected through convenient sampling. The Ethics Review Committee for Medical and Biomedical Research of Combined Military Hospital Peshawar granted approval of Study Protocol before the start of the study (reference No 00227/27 dated Sept 21).

Inclusion Criteria: Residents and paramedical staff from all departments of this tertiary care hospital were included in the study.

Exclusion Criteria: The residents and paramedical staff who had undergone BLS workshops in last two years were excluded from the study.

The BLS workshop was organised regularly during the above study interval by AHA-qualified BLS instructors in this tertiary care centre. Before the start of the workshop, their knowledge was assessed by a self-structured questionnaire prepared by AHA-accredited BLS trainers on which they also shared their demographic data after consent. The Workshop was conducted as per the prevailing protocol of AHA guidelines. At the end of the workshop, their knowledge was re-assessed using another questionnaire prepared by the instructors. Data were then analyzed using SPSS version 21. Paired Sample T test was applied and P value less than 0.05 were taken as significant at the start of the study.

Results

A hundred individuals were included in the study. It comprised 55 males and 45 females, including 35 residents, 24 house officers and 41 paramedical staff with mean ages of 27.86±1.17 years, 24.08±0.28 years and 30.56±2.90 years, respectively. The following table 1 depicts the total score of 100 before and after the workshop.

Table 1: The comparison of average pretest and posttest scores among the participant groups (total score=100)

Groups	Pre-test (n± SD)	Post-test (n± SD)	P value
Residents	63.42±15.33	76.57±10.27	<0.0001
House Officers	50.42±19.44	67.08±11.22	<0.0001
Paramedical staff	53.90±16.86	67.32±10.01	<0.0001

Most commonly attained pretest score among the residents, house officers and paramedical staff was 70(n=40), 50(n=32) and 70(n=68), respectively. The

most commonly secured post test score among residents, house officers and paramedical staff was 80(n=60), 70(n=32) and 70(n=88), respectively. The mean improvement in marks of residents, house officers and paramedical staff after attending the complete workshop was found to be 13.14±12.78, 16.67±14.35 and 13.41±10.87, respectively.

Discussion

The art of healing requires an understanding of the laws of nature and its regular practice in an organized way for its retention. These sessions are one of the ways to achieve that goal. This study has unveiled a few facts for us. The BLS program helped the participants improve their skills and knowledge regardless of their previous education. A similar conclusion was drawn by Knipe et al. in 2020 who recommended regular resuscitation workshops for better retention of CPR and related skills.¹² Surabaya Hospital, East java province, Indonesia, published a research paper based on their experience in training Basic life support workshops to the employees not belonging to the medical profession and found that it equipped them to provide first aid to the victims in the time of need.¹³ Gao et al. in 2018 found as a result of research that there was no difference in the amount of BLS knowledge and CPR skills attained by the non-medical students participating in the subject workshops compared with the medical students who participated along with them. This shows the palatability of the nature of the substance these sessions provide, which is easily understandable and reproducible by every healthy person.¹⁴

Ghamen et al. in 2018 conducted a cross-sectional study among Egyptian students, which concluded that the general knowledge regarding CPR was poor and recommended the regular cadre of the resuscitative workshop to improve the wisdom and capability to attend troubleshoots in case such events occur.¹⁵ Similar results were found in a study conducted in a tertiary care setup by A Hassan and also enlightened the fact that the repetition of such sessions has helped the students in managing the victims more quickly and in disciplined manner.¹⁶ Despite this fact, there are still some factors which make the student outshine its master. This study has shown that the baseline knowledge of resuscitative skills was better in residents than the rest of the house officers and paramedical staff. Irfan B et al. in

2019 conducted a survey and found similar results in which the doctors embodied better knowledge on the subject than the paramedical staff, which equipped them to tackle the crashed patients more efficiently.¹⁷

In our healthcare system, the house officers are the first responders to such events in the emergency room, and they are the ones who can and should pick the patients in cardiac arrest earlier and initiate Code blue which is the basic factor in increasing the chances of return of spontaneous circulation (ROSC) that ultimately saves patient's life. Another study done by Akhtar et al. in 2019 revealed that the essential of resuscitations required and expected by house officers was inadequate and is to be addressed before the start of their house job to improve patient care and safety so that they may be able to address such troubleshoots when the demand comes.¹⁸ The residents are expected to perform better, considering that they have medical experience under their belts, which compels them to face such situations more often than not. This aspect is seconded by the study done by Qian et al. in 2021, which revealed the residents have better CPR knowledge than the rest of the staff.¹⁹ Prasad et al. also got a study published in 2019 which showed postgraduates having average knowledge regarding resuscitative measures but poor practice owing to fewer refresher cadres arranged for Resuscitative skills.²⁰ When the post-test scores were compared with the pretest scores, the house officers gained more score than the residents and paramedical staff owing to the enthusiasm they have for the profession in their budding careers.

The study did not gauge the hands-on technique of the participants for which further studies can unveil interesting facts and help to improve these practice sessions.

Conclusion

Standardized BLS workshops have improved the Basic resuscitation skills of the participants belonging to all medical offshoots. House officers gained maximum benefit than other healthcare cadres of the hospital. Its regular organization will ensure the retention of CPR knowledge and skill for early recognition of victims under cardiac arrest and immediate initiation of resuscitation maneuvers which improve their chances of survival.

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