

FINDING EFFECTIVENESS OF TEACHING BASIC LIFE SUPPORT TO PARAMEDICS

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ABSTRACT

Objective: To determine the impact of single setting basic life support courses to paramedics by analyzing their responses.

Study Design: Cross sectional analytical study.

Place and Duration of Study: Combined Military Hospital Gujranwala and PNS Rahat Hospital, Karachi, Pakistan from Jan 2010 to Jan 2013.

Patients and Methods: This study consisted of printed questionnaire of 10 questions from cardiopulmonary resuscitation (CPR) basics prepared according to latest guidelines of American Heart Association (AHA) given to paramedics of two hospitals participating in basic life support (BLS) course from Jan 2010 to Jan 2013. The courses were run by a single person while distributing questionnaire to all participants of both genders performing duties at different departments of the hospital on rotation. Groups of similar education level were selected for these courses. The assessment of all participants was done after each course completion as per the questionnaire and data was collected for statistical analysis.

Results: In a study of 300 individuals the consistent response of performing chest compression was seen in a large no of participants (97.3%) which was followed by checking responsiveness (75%), checking carotid pulse (66.6%), effective chest compressions (76.6%), mask ventilation first attempt was successful in (33.3%), and second attempt (96.6%). Only 45 (15%) out of 300 had seen all types of available defibrillators (monophasic, biphasic, automated external defibrillator), monophasic defibrillator was seen by majority (83.3%) followed by biphasic (23.3%). Automated external defibrillator (AED) was seen by few (16.6%) out of 300. Mouth to mask ventilations was difficult in first attempt for majority with small success rate (33.3%) and improved in second attempt (290%). Checking responsiveness (75%) and feeling carotid pulse was poor in first attempt (33.3%); however it improved following practice (83.3%). Defibrillator paddle placement was easily mastered after practice. The defibrillation skills and knowledge of abbreviations taken from CPR guidelines was easily remembered by many participants.

Conclusion: BLS is simple to teach but mastering skills is difficult for everyone. The outcomes of training sessions over the time can be improved with customized repeated courses to maximum individuals while stressing on practical application. Furthermore prevalent teaching methods of this skill in our hospitals need purposeful modification keeping in view the participant's capacity.

Keywords: Basic life support, Cardiac arrest, Defibrillators.

INTRODUCTION

Despite important advances in prevention, cardiac arrest remains a substantial public health problem and a leading cause of death in many parts of the world. Cardiac arrest occurs both in and out of the hospital settings demanding early recognition and treatment. The keys to survival from sudden cardiac arrest (SCA) are immediate initiation of excellent CPR and early

defibrillation¹. The time from collapse to defibrillation is the most important determinant of survival and the chances for survival of victim decline 7-10% for every minute without defibrillation². It is expected that health care providers should be able to provide defibrillation to collapsed patients with ventricular fibrillation as soon as possible³. Defibrillators are life saving devices which are standard equipment in wards, emergency departments, and gaining popularity in community by easy access⁴. Early defibrillation is the key to success in cardiac arrhythmias, ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT)⁵. Once thought

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Received: 13 Dec 2013; Accepted: 25 Feb 2014

specialized equipment, AED has revolutionized the BLS practice by a layman who now understands when and how to attach this to the patient⁶.

CPR success is achieved by effective BLS teaching by adopting different methods. It is pertinent to note that there is no evidence for the best method of teaching BLS⁷. Unfortunately, skill is complex and not readily acquired--let alone retained--in the course of a single training session⁸. Most teaching efforts of BLS are done for the nurses, medical students and doctors neglecting paramedics and lay man who play vital role⁹. Inevitable problems necessitate due attention as the importance of this course is well known to all¹⁰. Teaching in small groups, trained staff, and education level with appreciation of basic knowledge and interest of participants are the major areas of problems for laymen and paramedics teaching. Multiple aiming sessions with regular assessment and incentive training may impart some perfection to this course. Moreover we suggest revision of teaching skills criteria for laymen, non paramedics, paramedics and doctors of different disciplines for building a team work. Implementation of regular basic life support course including detailed description and practice of defibrillation is recommended for hospital staff. The concerns in this regard must be addressed and prompt progressive action is desirable at all levels.

PATIENTS AND METHODS

This cross sectional study was conducted in two hospitals from Jan 2010 to Jan 2013 at Combined Military Hospital Gujranwala (Hospital 1) and PNS Rahat Hospital, Karachi (Hospital 2) while teaching BLS to paramedics. The participants were adults of both genders ranging from 20 to 40 years of age; performing duties in medical, surgical, operation theatre, dental, physiotherapy, laboratory and emergency departments of hospitals. All available paramedics fulfilling the inclusion criteria were enrolled. The inclusion criteria included basic matriculation with nursing class 1 and 2 for this

course which was run by a single person in a single session of 2 hours for each group of

Table-1: Descriptive statistics of paramedics and non paramedics.

Variable	Frequency	Percent	Valid %	Cumulative %
Male	248	82.7	82.7	82.7
Female	52	17.3	17.3	100
Matric	155	51.7	51.7	51.7
Matric + Class 1	123	41%	41%	92%
Matric + Class 2	22	7.3	7.3	100
Hospital 1	288	76.6	76	76
Hospital 2	72	24	25	100

average 20 individuals. Each participant was examined while performing skills on manikin. After completion of training session the question paper was distributed, solved and collected at the end of each workshop. A predefined key was provided for validating the responses of participants. The practical and essential aspects of BLS learning were emphasized during the courses and in questions. The questions asked were regarding abbreviations from CPR, knowledge of latest cardiopulmonary resuscitation guidelines (CPR), defibrillator types, paddles placement, checking unresponsiveness, checking carotid pulse, chest compression site and mask ventilation.

Data Analysis Procedure

Data thus collected at the end of study period had been analyzed in SPSS 11. Qualitative variables were presented as numbers and percentages where as quantitative variables were described as mean \pm standard deviation.

RESULTS

In study of 300 individuals which included 248 (82.7%) male, 52 (17.3%) females, matric education participants 155 (51.7%), matric with class1 participants 123 (41%) and class 2 were 22 (7.3%). The participants from hospital 1 were 288

(76.6%) and hospital 2 was 72 (24%) as given in table-1. The consistent response of chest

DISCUSSION

There is no evidence of best method of

Table-2: Questionnaire and results of participants after short basic life support course.

S. no	Questions/items	Answer results	Correct n (%)		Incorrect n (%)	
1	CPR guidelines	Chest compressions done	292	97%	8	2.6%
2	BLS sequence	Responsiveness is checked	225	75%	75	25%
		Carotid pulse check	200	66.6%	70	23%
		Chest compressions	250	83%	70	23%
		Mask ventilation successful	100	33%	170	56.6%
4	Paddles placement	Right upper sternum and Apex	86	28.6%	214	71%
5	Adult and children paddle difference	Size of paddles is different	195	65%	105	35%
6	Assistance provided	Assisted defibrillation in BLS	100	33%	200	66.6 %
7	Follow orders	All clear before delivering shock	140	46.6%	160	53%
8	Indications	Defibrillation	170	56.6%	130	43%
9	Meaning of abbreviations	a. BLS	250	83%		
		b. CPR and BLS	20	6.6%		
		c. CPR, BLS, AED	20	6.6%		
		d. CPR, BLS, AED, EMS	10	3.3%		
10	Familiarity	a. AED	70	23%		
		b. Monophasic	152	50.6%		
		c. Biphasic	78	26%		

(CPR) Cardiopulmonary resuscitation, (BLS) Basic life support

compression was seen in a large no of participants (97.3%) which was followed by checking responsiveness (75%), checking carotid pulse (66.6%), effective chest compressions (76.6%), mask ventilation first attempt was successful in (33.3%), and second attempt in (96.6%). Only 45 (15%) out of 300 had seen all types of available defibrillators (monophasic, biphasic, automated external defibrillator), monophasic defibrillator was seen by majority (83.3%) followed by biphasic (23.3%). Automated external defibrillator (AED) was seen by (16.6%) out of 300. Mask ventilations in first attempt was successful in very few (33.3%) and improved in second attempt (290%) but proper mask placement was difficult to master. Checking responsiveness (75%) and feeling carotid pulse was poor in first attempt (33.3%); however it improved following practice (83.3%). Defibrillator paddle placement was easily mastered after practice. The defibrillation skills and knowledge of abbreviations taken from CPR guidelines was easily remembered by majority (Table-2).

teaching basic life support (BLS)¹¹ but various methods are practiced to continually improve this skill. Simple lectures, multimedia approach, hands on workshops and combined approach have all been used to gain best outcomes. The importance of teaching BLS to all cannot be ignored as evident in studies where by stander CPR have saved lives¹². A successful bystander CPR is dependent on general awareness of practical BLS steps while addressing neglected fields. BLS consists of a number of life-saving skills as the "CAB"s (previously known as ABC. was recently changed by the American Heart Association) in pre-hospital emergency care has been marked as hall mark¹³. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS¹⁴.

The current selection on defibrillators is another dilemma which is not clear to many as far as use is concerned¹⁵. Although paramedics should be familiar and trained to independently use AED as per the AHA but the problem is fortified by unfamiliarity of AED by many. In our study most participants have not seen AED or used it. The poorest response was seen in locating and feeling carotid pulse followed by difficulty in mask ventilation but both were improved following repeated practice. BLS of adult and child required stressing on the difference between compression ventilation ratios and defibrillators energy selection in different studies 16.

The traditional approach of teaching BLS in hospital based class rooms is a demanding job and sparing staff from duty for long lectures is difficult. Lectures based on single setting over short time will not have long lasting impact. The existing knowledge of BLS played marked difference on outcomes of training while imparting more knowledge to already trained individuals¹⁷ and there was marked difference between pretest and post BLS test results in a study¹⁸. The performance of paramedics working in various departments was dissimilar. Emergency department, intensive care staff, operation room staff had better learning response compared to dental, pathology, gynecology, surgery and medicine. To check responsiveness, carotid pulse, chest compressions, ventilation with facemask and AED skills required extensive practice for those paramedics who are not practicing these skills. Language is one barrier for layman of non English natives along with equipment availability while training is technically easy¹⁹.

To emphasize we suggest modification of teaching methods in the language which he or she understands and repeated courses stressing on practical skills.

CONCLUSION

BLS is simple to teach but mastering skills is difficult for everyone. The outcomes of training sessions over time can be improved with customized repeated courses to maximum individuals while stressing on practical application. Furthermore prevalent teaching methods of this skill in our hospitals need purposeful modification keeping in view the participant's capacity.

REFERENCES

1. Charles N. Basic-life-support-bls-in-adults. <http://www.uptodate.com/contents/basic-life-support-bls-in-adults> (accessed May 2014).
2. Edward G, Maged S, Michael J, Murray. Cardiopulmonary resuscitation. *Clinical anaesthesiology*. 4th ed city: McGraw Hill 2006; p. 979.
3. Harris J. Biphasic defibrillation. *Emergency Nurse* 2002; 10.
4. Defibrillation and old id = 554415221. <http://en.wikipedia.org/w/index.php> (accessed this page was last modified on 10 May 2013).
5. Sekendiz B, Quick S. Use of automated external defibrillators (AEDs) in managing risk and liability in health/fitness facilities. *Int j of Spo Manag and Mark* 2011; 9 (3-4): 170-94.
6. Edward G, Maged S, Michael J, Murray. Cardiopulmonary resuscitation. In: John F, Butterworth, David C, Mackey, John D, Wasnick (eds) *Clinical anaesthesiology*. 4th ed. McGraw Hill, North America 2006; 987.
7. Hussain S, Eisenberg M. A systemic review and meta-analysis, police AED programs. *Resuscitation* 2013; 3(40).
8. Carrero E, Gomar C, Wilmpenzo, Neusfa, Bregas, Valero R et al. Teaching basic life support algorithms by either multimedia presentations or case based discussion equally improves the level of cognitive skills of undergraduate medical students. *Web Paper* 2009; 31: 189-95.
9. Garg R, Bhatara AR, Pruthi A, Bhatotra P, Anand R, Gupta N et al. Awareness among resident doctors with regards to cardiac defibrillators. *Saudi Med J* 2010; 4(3): 182-85.
10. Lynn P, Roppolo, Sauders T, Paul E, Pepe, Ahmad H et al. Layperson training for cardiopulmonary resuscitation: when less is better: Current opinion in critical care 2007; 13: 256-60.
11. Louise DM, Parr M. Teaching basic life support skills using self-directed learning, a self instructional video, access to practice manikins and learning in pairs. *Resuscitation* 2002; 52: 287-91.
12. Rodger A, Ferguson J, Beattie TF. Teaching basic life support. Letter to the editor, accident and emergency department, Aberdeen. *Arch Emerg Med* 1992; 9(3): 338.
13. Wikipedia. Basic life support. http://en.wikipedia.org/wiki/Basic_life_support (accessed Jan 2014).
14. Robert A, Chair, Hemphill R, Benjamin S, Tom P, Aufderheide et al. American heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care science. *Adult basic life support* 2010; Part 5.
15. Done ML, Parr M. Teaching basic life support skills using self-directed learning-instructional video, access to practice manikins and learning in pairs. *Resuscitation* 2002; 52 (3): 287-91.
16. Haskell SE, Kenney MA, Patel S, Sanddal TL, Altenhofen KL, Sanddal ND et al. Awareness of guidelines for use of automated external defibrillators in children within emergency medical services. *Resuscitation* 2008; 76(3): 354-9.
17. Chandrasekaran S, Kumar S, Bhat SA, Saravanakumar, Shabbir PM, Chandrasekaran V et al. Awareness of basic life support among medical, dental, nursing students and doctors. *Indian J Anaesth* 2010; 54(2):121-6.
18. Parashar AK. Effective planned teaching programme on knowledge and practice of basis life support among students in Mangalore. *The Nurs J Ind* 2010; 101(2): 40-1.
19. Derek JD, Vladimir GF, Raymond EI. Mechanism of defibrillation. *Ann Rev of Biomed Eng* 2010; 12: 233-58.

