



BLS TRAINING DURING MEDICAL UNDERGRADUATION: A NECESSITY?

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ABSTRACT

Introduction: Basic Life Support (BLS) is an integral part of delivery of health care which guides individuals to manage life threatening emergencies in a structured and effective way until advanced medical help arrives. It is the deemed responsibility of health care professionals to possess the basic skills and expertise of provision of BLS. The present medical and paramedical education has not given preference in providing knowledge and skills of BLS during the study period, however the medical and paramedical students are expected to perform the BLS at the very end of their study period once they enter their training period. It would be apt for them to be trained in provision of BLS during their study period.

Aim Of The Study: To assess the knowledge and attitude of medical students towards Basic Life Support

Method: This was a cross sectional study which was done on students studying MBBS from first year to final year of a tertiary care referral medical college hospital. The students were made to answer a questionnaire based on the BLS algorithm to assess for their knowledge on BLS and also the attitude of the students was assessed. The statistical analysis was done using IBM SPSS software.

Results: A total of 624 students participated in the study. Only 13.3% (p value-0.001) of the total participants had good knowledge about BLS. Only 8.3% of them were highly confident in providing CPR. Majority of the participants had a positive attitude and found it necessary to acquire the knowledge as well as skills of BLS (98.7%). Majority of them opined hands-on training in BLS was to be included in the curriculum of MBBS (97.8%).

Conclusion: The knowledge of BLS among the medical students was inadequate. The medical students had a positive attitude towards acquisition of knowledge and skills of BLS.

KEYWORDS : Basic Life Support, Medical Students.**INTRODUCTION**

Sudden death is defined as natural death, in which the time and mode of death is unexpected, in an individual with or without pre-existing cardiac diseases, and which occurs within 1 hour of the onset of the heralding symptoms.¹ Sudden deaths can occur anywhere, at any time. It is caused by a myriad of clinical conditions. Most of these sudden deaths have been greatly attributed to cardiac causes and many studies have used the term 'sudden death' and 'sudden cardiac death (SCD)' interchangeably.²

Sudden deaths can be out of hospital cardiac arrest or in hospital cardiac arrests. In India, there is not much data available on the outcome of out of hospital cardiac arrests. However few studies have estimated the contribution of sudden cardiac deaths to overall mortality. A study that was done in southern India revealed SCD contributed to 10.3% of overall mortality with involvement of younger population with a high prevalence of major risk for coronary artery disease.³

Out-of-hospital cardiac arrest (OHCA) describes the loss of mechanical cardiac function and the absence of systemic circulation. The unpredictable and time-sensitive nature of OHCA makes it a unique medical emergency. With every second passing, there is continuous process of cell death, which in turn impairs the structure as well as function of organ systems, directly having an impact on the survival. Hence a shorter period of time to response has a greater survival benefit and also improves prognosis and neurological outcome.

Life threatening emergencies are routinely encountered anytime, by anyone and at anywhere. Identification and management of the same becomes the need of the hour. Basic life support (BLS) helps individuals provide the immediate, appropriate and effective techniques and manoeuvres to resuscitate cardiac arrest victims without advanced equipment. It can be taught to and can be practised by laymen with no advanced medical knowledge. BLS imparts knowledge in recognizing cardiac arrest in individuals of all age groups, initiating Cardiopulmonary resuscitation (CPR) and the appropriate use of automated external defibrillator (AED), immediate management of choking in adults as well as in children and infants. It is beneficial that every person in the community is trained in BLS which

will save lives as well as increase the overall community health quality. It is a deemed responsibility of health care professionals to possess the basic skills and expertise in provision of basic life support as they are frequently encountered with life threatening emergencies in their everyday practice. Medical students are in the process of being trained to be competent providers of medical care, it becomes critical for them to know the aspects of BLS during the training period. They form an integral part of health care system and knowledge of BLS among them not only helps save lives but they can educate their friends and family members to learn about BLS and delivery of the same to the community. But presently BLS is not included in the current curriculum of medical students. In this study we have assessed the knowledge, attitude and practice of Basic life support among medical students of a tertiary care medical hospital.

METHODOLOGY**Design**

This was a cross-sectional study which was conducted over a period of 3 months (September 2019- November 2019) at a tertiary care medical college hospital. All medical students from first year to final year currently pursuing MBBS degree from batches 2015-2019 were included. Those students who refuse to give consent for the study and those who are not attending college during the study period were excluded from the study. Ethical approval was obtained by the Institutional Ethics review board.

Data Collection

The purpose of the study was explained to the participants. Informed consent was taken. A questionnaire was prepared and reliability testing of the questionnaire was done. The questionnaire was entered into Google forms. The students were approached in their respective classrooms and the link to the questionnaire was sent to all participants on their mobile phones. They were given 35 minutes to fill the questionnaire. For those participants who did not have mobile phones or did not have internet on their phones were asked to give answers on papers.

The first part of the questionnaire consisted of the year of study of MBBS, and regarding encountering of any life threatening emergencies, witnessing and previous performance of BLS. The second part of the questionnaire consisted of a total of 21 questions

which assessed the knowledge of the participants of BLS. Each question carries 1 mark. Those who scored more than 16 were considered to have good knowledge, 8-15 scores were considered to have medium knowledge and scores less than 7 were considered to have poor knowledge. The third part of the questionnaire was to know about their current understanding of BLS, their confidence level in performing CPR and their attitude towards receiving training of BLS as a part of their curriculum.

Statistical Analysis

The data are represented in frequency and percentages. The data was analysed using Chi-square test. p value <0.05 was considered statistically significant. The conclusions were drawn based upon the result of the analysis. Sample Size calculation was done with confidence level of 0.95, Z value associated with confidence of 1.96. Absolute precision was 5%. The sample size was estimated to be 435. The reliability testing of the questionnaire was done.

RESULTS

A total of 624 students participated in the study. 140 (22.4%) students were in first year MBBS, 259 (41.5%) students were in second year MBBS, 119 (19.1%) students were in third year MBBS and 106 (17%) students were in final year MBBS.

The participants were asked whether they had encountered any life threatening emergencies. A majority of them did not come across any life threatening emergencies (87%), they were asked if they had ever provided CPR or witnessed anyone giving CPR. Most of the students had not performed (96.8%) nor had witnessed anyone performing CPR (71.8%).

Table No.2 Knowledge Of BLS Among The Study Population

QUESTION	1 YEAR	2 YEAR	3 YEAR	4 YEAR	Total	P value
To start CPR on unconscious patient on road	93 (66.4 %)	132 (51%)	43 (36.1%)	36 (34%)	304(48.7%)	<0.001*
Can CPR be given to infants and children	103 (73.6%)	118 (45.6%)	78 (65.5%)	78 (73.6%)	377(60.4%)	<0.001*
CPR be given inside and outside hospital	129(92.1%)	232 (89.6%)	115 (96.6%)	100 (94.3%)	576 (92.3%)	0.090
Expansion of BLS	134 (95.7%)	228 (88%)	114 (95.8%)	104 (98.1%)	580 (92.9%)	0.001*
First response to an unresponsive patient in the middle of road	124 (88.6%)	72 (27.8%)	37 (31.1%)	41 (38.7%)	274 (43.9%)	<0.001*
Decision if person in cardiac arrest	110 (78.6%)	188 (72.6%)	86 (72.3%)	88 (83%)	472 (75.6%)	0.120
Response to a person unresponsive , not breathing and no pulse	96 (68.6%)	187 (72.2%)	101 (84.9%)	92 (86.8%)	476 (76.3%)	<0.001*
Use of AED	80 (57.1%)	68 (26.3%)	26 (21.8%)	35 (33%)	209 (33.5%)	<0.001*
Artery to be palpated during pulse check	124 (88.5%)	231 (89.1%)	95 (79.8%)	100 (94.3%)	550 (88.1%)	0.041
Significance of chest compression	53 (37.9%)	93 (35.9%)	30 (25.5%)	44 (41.5%)	220 (35.3%)	0.05*
Rationale for chest recoil	99 (70.7%)	145 (56%)	74 (62.2%)	72 (67.9%)	390 (62.5%)	0.018
Compression rate	76 (54.3%)	36 (13.9%)	26 (21.8%)	23 (21.7%)	161 (25.8%)	<0.001*
Compression location	28 (20%)	48 (18.5%)	24 (20.2%)	37 (34.9%)	137 (22%)	0.005*
Compression depth	92 (65.7%)	112 (43.2%)	61 (51.3%)	34 (32.1%)	299 (47.9%)	<0.001*
Compression to ventilation ratio	124 (88.6%)	132 (51%)	65 (54.6%)	92 (86.8%)	413 (66.2%)	<0.001*
Frequency of pulse check	105 (75%)	163 (62.9%)	84 (70.6%)	68(64.2%)	420 (67.3%)	0.069
Response to choking adult	17 (12.1%)	65 (25.1%)	12 (10.1%)	14 (13.2%)	108 (17.3%)	<0.001*
Correct positioning of arms during Heimlich maneuver	106 (75.7%)	180 (69.4%)	86 (72.2%)	82 (77.3%)	454 (72.7%)	0.347
Approach to unresponsive adult after choking	71(50.7%)	91 (35.1%)	45 (37.8%)	43 (40.6%)	250 (40.1%)	0.02
Maneuver to relieve choking in infants	42 (30%)	80 (30.9%)	35 (29.4%)	30 (28.3%)	187 (30%)	0.967
Response to child in respiratory arrest	65 (46.4%)	142 (54.8%)	57 (47.9%)	33 (31.1%)	297 (47.6%)	0.001*

In this study 2.9% of first year MBBS, 20.5% of second year MBBS, 17.6% of third year MBBS and 6.6% of fourth year MBBS had good knowledge of BLS. Majority of the students rightly answered the expansion of BLS (92.9%, p=0.001). The participants had the least knowledge (<7 score) about management of choking (30%, p-value<0.001), the number of chest compressions per minute (22.8%, p-value<0.001) and location of chest compression (22%, p-value 0.005) to be given.

Table No 3. Distribution Of Knowledge Of BLS Among The MBBS Students

Year of MBBS	Good knowledge (>16 scores)	Adequate knowledge (8-15 scores)	Poor knowledge (<6 scores)	Total	Chi square value	P value
1	4 (2.9%)	109 (77.9%)	27 (19.3%)	140 (100%)	54.811	0.001
2	53 (20.5%)	196 (75.7%)	10 (3.9%)	259 (100%)		
3	21 (17.6%)	92 (77.3%)	6 (5.0%)	119 (100%)		

Percentage of students

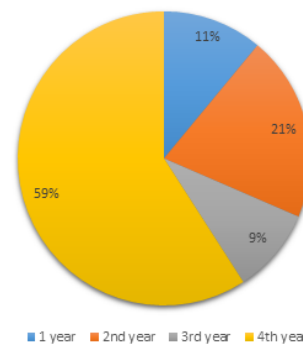


Figure 1. Percentage Of Students Belonging To Different Year Of MBBS

Table No.1 Frequency Of Participants With Their Previous Experience With Life Threatening Emergencies And CPR

	Yes	No	Total
Encountered any life threatening emergencies	81 (13%)	543 (87%)	624 (100%)
Provided CPR before	20 (3.2%)	604 (96.8%)	624 (100%)
Witnessed anyone giving CPR	176 (28.2%)	448 (71.8%)	624 (100%)

The following table shows the questions asked and the correct answers given by the participants belonging to different year of MBBS.

4	7 (6.6%)	90 (84.9%)	9 (8.5%)	106 (100%)		
TOTAL	85 (13.5%)	487 (78%)	52 (8.3%)	624 (100%)		

The students were asked after the questionnaire to self-assess the knowledge regarding BLS whether it was satisfactory or not (Table no. 4).

Table No 4. Self-assessment Of Knowledge Of BLS Among Participants

Year of MBBS	Satisfactory	Not satisfactory	Total	Chi square value	P value
1	117 (83.6%)	23 (16.4%)	140 (100%)	98.156	0.0001
2	94 (36.3%)	165 (63.7%)	259 (100%)		
3	49 (41.2%)	70 (58.58%)	119 (100%)		
4	34 (32.1%)	72 (67.9%)	106 (100%)		
Total	294 (47.1%)	330 (52.9%)	624 (100%)		

The attitude of the participants about BLS was assessed by asking whether it was necessary for them to have the knowledge and skills of BLS (table no 5). They were asked if they wanted to be trained in a hands-on BLS training workshop.

Table No 5. Participants On The Need For Acquiring The Knowledge And Skills Of BLS

Year of MBBS	Not Necessary	Necessary	Total	Chi square value	P value
1	3 (2.1%)	137 (97.9%)	140 (100%)	2.377	0.498
2	3 (1.2%)	256 (98.8%)	259 (100%)		
3	2 (1.7%)	117 (98.3%)	119 (100%)		
4	0 (0%)	106 (100%)	106 (100%)		
Total	8 (1.3%)	616 (98.7%)	624 (100%)		

A majority of the students (98.7%) felt it is necessary to acquire the knowledge and skills of BLS and on the contrary (1.3%) of the students did not think it was necessary to have the knowledge of BLS.

At present training in BLS is not a part of curriculum of MBBS. The participants were asked at the end of the questionnaire whether it was necessary to include training in BLS as a part of MBBS curriculum.

Table No 6. Consensus On Need For Inclusion Of BLS In MBBS Curriculum

Year of MBBS	Yes	No	Total	Chi square test	P value
1	137 (97.9%)	3 (2.1%)	140 (100%)	4.402	0.221
2	250 (96.5%)	9 (3.5%)	259 (100%)		
3	117 (98.3%)	2 (1.7%)	119 (100%)		
4	106 (100%)	0 (0%)	106 (100%)		
Total	610 (97.8%)	14 (2.2%)	624 (100%)		

The participants were asked to self-assess their confidence in performance of CPR in a scale of 0-10. In this study we have divided the scale into three categories. 0-3 is least confident, 4-6 is moderately confident and >7 being highly confident.

Table No 7. Level Of Confidence Of Participants To Perform CPR

	No of participants
Least confident	85 (13.6%)
Moderately confident	487 (78%)
Highly confident	52 (8.3%)
Total	624 (100%)

The association between the knowledge of BLS and the confidence of performance CPR was evaluated.

Table No 8. Association Between The Knowledge Of BLS And The Level Of Confidence In Performing CPR Among The Participants

	Least confident	Moderately confident	Highly confident	Total	Chi square value	P value
Good knowledge	37 (43.5%)	29 (34.1%)	19 (22.4%)	85 (100%)	17.346	0.002
Average knowledge	157 (32.2%)	181 (37.2%)	149 (30.6%)	487 (100%)		
Poor knowledge	7 (13.5%)	19 (36.5%)	26 (50%)	52 (100%)		
Total	201 (32.2%)	229 (36.7%)	194 (31.1%)	624 (100%)		

DISCUSSION

BLS knowledge and skills are very simple and can be easily understood as well as practiced by a layman. They are life-saving skills from which all the members of the society will benefit. It does not require any advanced medical equipment or good medical knowledge to perform BLS. In most of the developed countries considering the benefits of CPR, they have recommended BLS training even for high school students^{5,6}. However in India there is no recommendation and training regarding BLS for medical and paramedical students.

In our study we have included medical students from first year to final year. They were asked if they had encountered any life threatening emergencies earlier. 81 (13%) of the participants had encountered a life threatening emergency. We found that the second year MBBS students reported to have encountered more number of life threatening emergencies (n=34, 42%) than other students.

The participants were asked if they had provided CPR, only 20 (3.2%) of them had provided CPR and 176 (28.2%) had witnessed CPR, however those who had witnessed and provided CPR was during their clinical rotational postings in the department of Emergency Medicine

and none of them had witnessed an out of hospital CPR. A total of 48 (7.7%) participants thought that CPR can be given inside hospital only. A study done by Sharma et al⁷ in a south India hospital had similar results that 13% of the study group thought that CPR can be given only inside hospital. Even though most of the participants knew that CPR can be given to victims inside and outside hospital, it is important that all of the students must know that CPR can be given in both inside and outside the hospital.

The knowledge of BLS was assessed using questionnaire based on the AHA BLS algorithm. A total of 21 knowledge based questions were asked to the participants. Each question was given a score of one. Knowledge of BLS and year of MBBS was tabulated by comparing the scores of each students in to three score categories, good knowledge (>16 score), adequate knowledge (8-15 scores) and poor knowledge (<7 score). None of the participants answered gave all the right answers which was similar to the study done by Vasudevan et al⁸ where none of the students gave all the right answers.

A total of 85 (13.5%) had good knowledge, 487 (78%) had average knowledge and 52 (8.3%) had poor knowledge; p value-0.002 which was compared to the study done by Vasudevan et al⁸ where 21 (3.7%) had good knowledge, 375 (65.2%) had average knowledge and 179 (31.1%) had poor knowledge; p value-0.001.

Out of 21 questions, first year MBBS students had the highest scores in 10 questions than other MBBS students. This could be due to the newly introduced foundation course from the batch of 2019 course which is recently implemented as a part of new curriculum for MBBS students, one of the components of this foundation course is training about BLS for one day.

But overall the second year MBBS students had obtained the highest score compared to other students 53 (20.5%). This could be due to the Emergency clinical postings which they attend during their second year where the students are taught about BLS by the Emergency medicine consultants to the students. Even the third and final year student will have the clinical postings during their second year study period, despite which they lacked good knowledge hence it is important to have repeated exposure towards the knowledge and skills of BLS. In a recent study, it has also been seen that acquisition of knowledge is highest immediately after training which subsequently reduces⁹. A study done by Yunus MD et al¹⁰ concluded that even trained participants need repeated training(s).

The association between the knowledge of BLS and the confidence of performance CPR was evaluated. Only 8.3% (table no 7) of the participants were highly confident in providing CPR. Among those who had good knowledge of CPR, only 22.4% of them were highly confident in providing CPR. This was due to not much hands-on experience by the students. We compared this result to a study done by Tsegaye et al¹¹ where a total of 235 (98.7%) of students were revealed that lack of training as major factors affecting practice of CPR, followed by poor exposure (93.56%). Only 84% participants stated that lack of confidence is one factor affecting practice of CPR.

Majority of the participants felt that their knowledge about BLS was not satisfactory, however most of the first year MBBS students felt they had satisfactory knowledge regarding BLS. This again could be due to the foundation course. The present medical and paramedical education has not given preference in providing knowledge and skills of BLS during the study period, however the medical and paramedical students are expected to perform the BLS at the very end of their study period once they enter their training period. In our study we found that the participants had a positive attitude towards BLS, and found it necessary to acquire the knowledge as well as skills of BLS (98.7%) and a majority of them wanted training in BLS was required to be included in the curriculum of MBBS (97.8%). In the study conducted by Avabratha KS et al¹¹, all the study participants suggested to include BLS in the undergraduate curriculum.

CONCLUSION AND RECOMMENDATION

We conclude that that knowledge of BLS among the medical students was inadequate. The medical students had a positive attitude towards acquisition of knowledge and skills of BLS. We recommend that a hands-on training on BLS should be incorporated in the current curriculum of MBBS and it has to be re-enforced every year.

Conflicts Of Interest Nil**REFERENCES**

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