

Original Research Article

Assessment of level of knowledge of basic life support algorithm among medical and nursing students in a tertiary care teaching hospital

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ABSTRACT

Background: Every person should know about basic life support resuscitation (BLS) skill, but its knowledge is vital for medical and paramedical personnel. Structured training & retraining is required for its efficient execution which is lacking in the current medical curriculum. Basic situation analysis regarding the student's knowledge regarding BLS is necessary to develop an effective training programme. Objective of the study was to assess the knowledge of BLS resuscitation algorithm among medical and nursing students of Medical College Kottayam, Kerala and to find whether there is any difference in the knowledge level of medical & nursing students about BLS.

Methods: A cross-sectional Analytic study was conducted among the medical and nursing students of Govt. Medical College, Kottayam. 575 medical students and 236 nursing students who joined the course from 2010 -2013 were included in the study. Data was collected using structured questionnaire which collected information regarding the basic demographic factors, knowledge regarding the BLS resuscitation algorithm, their opinion regarding the causes of lack of knowledge & starting of a structured course of BLS in their curriculum.

Results: Median knowledge score was 7 with an inter-quartile range of 4. Average knowledge score was significantly higher among nursing students (8.5 ± 2.8 Vs 6.6 ± 2.5 ; p value-0.001). Highest knowledge level was seen among those who had seen the BLS previously (15.2% Vs 4.5%; p value- 0.001) or attended the BLS workshop previously (8.1% Vs 7.3%; p value-0.001). Final year medical and first year nursing students were having higher knowledge as compared to other students.

Conclusions: Knowledge regarding the BLS was less among the students of Government Medical College, Kottayam, Kerala, India nursing students were having higher knowledge than Medical students.

Keywords: BLS, Knowledge, Kerala, Medical students, Nursing students

INTRODUCTION

Cardiac arrests and accidents are the most common emergencies with grave consequences. These emergencies can be managed efficiently by proper knowledge and practice of resuscitation skills.

Resuscitation is the art of restoring life or consciousness of one apparently dead. Cardiopulmonary resuscitation (CPR) is a series of lifesaving actions that improve the chance of survival following cardiac arrest. Basic life

support (BLS) is a level of medical care which is used for patients with life threatening illness until the patient can be given full medical care.¹ CPR is the technique of providing BLS until advanced life support (ALS) can be provided or spontaneous circulation or ventilation is restored. It can be provided by trained medical personnel including emergency medical technicians and by lay persons who have received BLS training.

Cardiac arrest results in the cessation of blood supply to the brain leading to depression of breathing as well. Thus

this combination of no breathing and circulation causes generalized ischemia, which in cases of brain, allows a narrow window of ten minutes only. That is if anything has to be done it has to be done within ten minutes because after that survival is impossible. According to American Heart Association, CPR should start within 10 seconds of recognition of cardiac arrest.² This awareness has placed a growing demand on medical personnel for expertise in resuscitation.

BLS requires nothing as far as resources are concerned and its importance is undeniable. Proper practice of the techniques and maneuvers enables a person to effectively resuscitate a victim. Ideally everyone should know BLS and CPR but its awareness to medical personnel should be a pre-requisite for entering into this field. All medical, nursing and para- medical students are expected to know resuscitation. The ability to diagnose and treat a respiratory or cardiac arrest is a basic medical skill that all doctors are generally assumed to possess.

But the fact is that many junior doctors & nurses are not competent in carrying out effective cardiopulmonary resuscitation.³ Structured pattern of BLS training is lacking even in medical curriculum. It is also a fact that after graduation, training of resuscitation skills is difficult. Busy residency schedules and lack of resources act as barriers. Doctors are expected to learn resuscitation skills in the clinical setting, where there is little opportunity to correct poor techniques. As a result many may find it difficult when they suddenly come across a situation of resuscitation of a person or a sick child.

There are not many published studies to assess the knowledge of Basic Life Support Resuscitation Algorithm among the Medical & Nursing students of Kerala. There is a session of 3 hours, on CPR during the 1st semester posting of Medical Students in certain Medical Colleges of Kerala which may be highly inadequate to train these students. Hence this study is planned to conduct to assess the basic knowledge of students of Kottayam Medical College in BLS resuscitation algorithm. This initial situation analysis may help to plan & develop a teaching module in this field which may help to develop a future Medical & nursing personnel with better knowledge & skill in BLS resuscitation.

Objectives

- To assess the knowledge of BLS resuscitation algorithm among medical and nursing students of Govt. Medical college Kottayam.
- To assess whether there is any difference in the knowledge level of medical& nursing students about BLS
- To measure the attitude of the students for the introduction of proper training regarding BLS in their curriculum

METHODS

Study design: It was a cross -sectional analytical study.

Study period: Six months (December 2013 – May 2014)

Study setting: Government Medical College & Government Nursing College, Kottayam, Kerala, India

Sample size: Sample size consist 810.

According to a study conducted by Hassan Zaheer⁴, 21% of medical students knew about the skills for BLS. Based on this data and using the formula $4pq/l^2$ the minimum sample size for the present study was calculated as 737.

$4 =$ square of Z value for alpha error (1.96)

$P =$ proportion in the previous study= 21%

$q = 100 - p$

$l =$ absolute Precision = 3

$4pq/l^2 = 737$, Giving allowance for a non response rate of 10% the final sample size was fixed to be 810

Study population : Study subjects were the Medical Students and Nursing Students of 2010-2013 batches of Govt Medical College & Govt.Nursing College, Kottayam. All students in the selected batches were included in the study.

Study tool: It is a semi-structured questionnaire.

Study procedure: Permission for conducting the study was obtained from the Head of the Department of Community Medicine & from the Principals of Medical College & Nursing College. Ethical committee clearance was obtained from the Institutional Review Board of Government Medical College, Kottayam. The investigator explained the purpose and importance of the study to the participants and obtained consent for the study. Information was collected using a pre-tested validated questionnaire. The questionnaire was designed based on the available literature² and consisted of three parts. The first part collected socio demographic information about the participant. The second part had seventeen questions assessing the knowledge of BLS resuscitation algorithm; each correct answer was scored 1 and each wrong answer was scored as 0. Those who obtained a total score of less than 6 were considered to have poor knowledge, 7-12 score were considered to have medium knowledge and those who got score equal or higher than score 13 were considered to have good knowledge. Questionnaires were completed anonymously, "in a class room" setting. The final part included questions assessing information concerning the respondents` past experience in BLS training and their attitude towards receiving training in BLS as part of the

curriculum. Every attempt was taken to avoid discussion among participants during the time of completing the questionnaire. The participants were motivated to fill the Performa completely. The participants who could not be contacted even after 3 attempts were excluded from the study.

Data management and statistical analysis

Data was entered in Microsoft Office Excel and analysis was done using SPSS Version 16.0. Frequency & median was calculated based on the type of variable. Standard Error, Inter-quartile range and 95% confidence interval was calculated. Association between variables was tested with 'Chi Square Test' and where ever continuous variables were to be tested, 'Independent samples t test' was used. Nonparametric test was used whenever needed since the outcome was measured in scores. The level of significance was taken at a p value of <0.05.

RESULTS

Data was collected from 575 MBBS students and 236 nursing students. 25 MBBS students and 4 nursing students were not able to contact even after repeated efforts. So they were excluded from the study. So the final sample size was 811 out of 840 students with a response rate of 96.5%. Majority of them were belonging to the age group 18- 23 years. Only 7 students were above the age of 23 and no one was below 18 years. In each year there were around 150 medical students and 60 nursing students.

Table1: Gender distribution of the study population.

Course		Gender		Total
		Male	Female	
MBBS	Number	232	343	575
	Percentage	40.3%	59.7%	100%
Nursing	Number	2	234	236
	Percentage	0.8%	99.2%	100%
Total	Number	234	577	811
	Percentage	28.9%	71.1%	100%

The knowledge of the students regarding the BLS resuscitation algorithm was assessed by seventeen questions. The Table 2 shows the knowledge of MBBS and nursing students regarding the various aspects of BLS resuscitation algorithm.

Out of the 17 questions which measured the knowledge on BLS algorithm no participant answered all the questions correctly and no single question yielded 100 % correct response from all the participants .More nursing students gave the correct response to 13 questions as compared to the medical students of the same institution.

In nine out of these thirteen questions the proportion of students giving correct responses were significantly higher among nursing students. Of the four questions where the correct responses were more among medical students the difference was statistically significant only in one question

A combined knowledge score was calculated by combining the score of the seventeen questions and divided the study population into three groups based on their final score. Those who obtained a total score of less than 6 were considered to have poor knowledge, 7-12 score were considered to have medium knowledge and those who got score equal or higher than score 13 were considered to have good knowledge. The median score of the study participants was 7 with the inter-quartile range of 4.

Among the medical students 31.1% had only poor knowledge, while among nursing students it was only 14%. Among the medical students 3.7% had good knowledge regarding BLS, and 17.4% of nursing students had good knowledge. The average score of nursing students was significantly higher as compared to medical students, 6.6 ± 2.5 vs 8.5 ± 2.8 (Mann – whitney test, p value – 0.001).

Final year medical students had highest knowledge of BLS compared to other batches. It was also observed that the first year students had higher knowledge compared to second and third year students. The difference in the knowledge between the various batches was statistically significant. This can be due to the reason that Dept. of Community Medicine is conducting a two hour session on BLS for the first year students during their Community Medicine posting. The second and third year students had not received any training in BLS. The final year students have undergone more hours of clinical training as compared to others and hence are more likely to have received information regarding BLS. These findings indicate the need for a structured programme for BLS. It was also observed that the first year nursing students were having better knowledge compared to other batches. As they go from 1st year to final year their knowledge level was decreasing. This again highlights the importance of periodic re -training in BLS.

83 (14.4%) of MBBS students and 154 (65.3%) of nursing students had observed BLS resuscitation at least once during their course. Out of 237 study subjects who had observed it at-least once had significantly higher knowledge compared to those who had not. The average score was also high among those who had observed BLS as compared to those who had not observed BLS during their course (8.7 ± 2.5 vs 6.5 ± 2.5 . Mann- whitney U test, p value – 0.001).

Table2: Knowledge of BLS among the study population.

Response	Rightly answered				P value
	MBBS (575)		Nursing (236)		
	Number	Percentage	Number	Percentage	
Expansion of the abbreviation “BLS”is Basic Life support	439	76.3%	195	82.6%	0.04*
BLS can be performed in and out of a hospital setting	499	86.8%	223	94.5%	0.001*
Sequence of procedures for doing BLS is CAB	105	18.3%	140	59.3%	0.001*
Rate of chest compression in an adult is 100/minute	163	28.3%	116	49.2%	0.001*
Depth of chest compression in an adult is 5cm	258	44.9%	105	44.5%	0.92
Site of chest compression in an adult is mid chest	361	62.8%	143	60.6%	0.55
Ratio of chest compression and breathing during BLS is 30:2	125	21.7%	141	59.7%	0.001*
The method of airway opening when only one rescuer is present is head tilt- Chin lift method	282	49.5	129	54.7%	0.146
Site of chest compression in a child is the centre of chest just below the nipple line	92	16%	64	27.1%	0.001*
Artery to be palpated for pulse check in a child during BLS is Brachial artery	131	22.8%	68	28.8%	0.35
Preferred method of rescue breathing in an infant is Mouth –to-mouth & nose	115	20%	60	25.4%	0.08
Depth of Chest compression in an infant during BLS is 4cm	266	46.3%	159	67.4%	0.001*
No. of rescue breathing to be given for an adult/minute is 10-12	121	21%	92	39%	0.001*
When you find someone unresponsive in the middle of the road and you are alone, the first response is to look for safety	241	41.9%	115	48.7%	0.07
The immediate action to be taken when an unresponsive patient is not responding to the initial attempt to awake him is to activate the emergency response	117	20.3%	47	19.9%	0.88
The action to be taken when you find someone suffering from choking is to give abdominal thrust	284	49.4%	88	37.3%	0.002*
Expansion of AED is Automated External Defibrillator	209	36.3%	136	57.6%	0.001*

Table 3: Distribution of knowledge level according to the course of study.

	Course			
	MBBS		Nursing	
	Number	Percentage	Number	Percentage
Poor knowledge	179	31.1 %	33	14 %
Medium knowledge	375	65.2 %	162	68.6 %
Good Knowledge	21	3.7%	41	17.4%
Total	575	100%	236	100%

Chi-square value – 60.32; p value – 0.001*

Table 4: Association of knowledge level and the previous experience of observing BLS being delivered.

Knowledge level	Seen BLS		
		Yes	No
Poor knowledge	Number	21	191
	Percentage	8.9%	33.3%
Medium knowledge	Number	180	357
	Percentage	75.9%	62.2%
Good knowledge	Number	36	26
	Percentage	15.2%	4.5%
Total	Number	237	574
	Percentage	100%	100%

Chi square value – 67.97; p value-0.001*.

Only 58 (10.1%) MBBS students and 28 (11.9%) nursing students attended BLS workshop during their course. Out of the 86 students who had attended BLS workshop 81(94.2%) had medium or high knowledge as compared to 516 (71.2%) who had not attended BLS workshop. The mean score was significantly higher among those who had attended BLS workshop previously (8.5 ± 2.3 vs 7.03 ± 2.7 Mann-Whitney U test ,p value - 0.001).

Table 5: Association of knowledge level and previous training in BLS.

Knowledge level	Attended BLS workshop		
		Yes	No
Poor knowledge	Number	5	207
	Percentage	5.8 %	28.8 %
Medium Knowledge	Number	74	463
	Percentage	86.1 %	63.9 %
Good Knowledge	Number	7	53
	Percentage	8.1 %	7.3 %
Total	Number	86	725
	Percentage	100%	100%

Chi square value – 30.16; p value-0.001*.

493 (60.3%) students reported the lack of professional training as the cause of poor knowledge about BLS among students. Other reasons suggested by the students for poor knowledge were busy curriculum (29.2%), lack of interest (6.2%) etc. 791(97.5%) of study subjects were having the opinion that a structured programme on BLS resuscitation should be included in the curriculum. Only 20 students were suggested that there is no need to include the BLS in the curriculum.

DISCUSSION

The present study revealed that the average knowledge score among the study participants was 7 with an inter-quartile range of 4. The nursing students were having significantly higher knowledge compared to medical students (8.5 ± 2.5 Vs 6.5 ± 2.8)

A study conducted by Sreedhara Avabratha et al revealed that only 13.3% of the interns had good knowledge regarding BLS and the average score was 9.05.⁵ Raghava Sharma et al in their study reported that 19% of medical interns and 0% of dental interns had complete knowledge while 44% of medical interns and 88% of dental interns had poor knowledge regarding BLS.⁶

The study conducted by Chandrasekaran S et al reported that in their study 83% of medical students and 98.4% of nursing students scored less than 50% of marks and the practicing and teaching doctors scored less than the nursing teaching faculty.⁷

The present study revealed that those who had seen BLS earlier or participated in BLS workshop had higher knowledge regarding the BLS.

Study conducted by Sharma R et al reported that Resuscitation experience and training in BLS resulted in better knowledge score and thus boosted the confidence of study subjects.⁶ In a study conducted by Zaheer H it was observed that only 14.9% of medical students attended BLS training during their course and these students had a significantly higher knowledge regarding BLS.⁴

Majority of the study participants reported that the major reason for the lack of knowledge among study participants is the lack of proper training in the curriculum.97.5% of the study participants suggested that BLS should be included in the curriculum.

In the study conducted by Avabratha KS et al, all the study participants suggested to include BLS in the undergraduate curriculum.⁵ Medical council of India is also recommending that Basic Life Support should be included in the undergraduate curriculum along with the foundation course itself.⁸

CONCLUSION

Knowledge regarding the BLS was less among the students of Government Medical College, Kottayam, Kerala, India nursing students were having higher knowledge than Medical students.

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Conflict of interest: None declared

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