

A cross-sectional study to assess knowledge and attitudes related to Basic Life Support among undergraduate medical students in Tamil Nadu, India

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ABSTRACT

Introduction: Basic life support (BLS) with cardiopulmonary resuscitation (CPR) provided at the right time greatly improves survival following cardiac arrest. Adequate knowledge and skills related to BLS are essential requisites for medical students. This study aimed to explore the knowledge, attitudes, and practices related to BLS among undergraduate medical students of a medical college in Tamil Nadu, India.

Materials and Methods: This was a descriptive, cross-sectional study conducted among 241 undergraduate medical students of a medical college in Tamil Nadu, between May and July 2012, using a pretested, semi-structured questionnaire devised based on American Heart Association Guidelines for BLS and CPR 2010.

Results: The mean knowledge score of the participants was 4.55 ± 1.21 out of a possible high score of 6. The level of knowledge and attitudes related to BLS varied depending on the year of study, and this difference was statistically

significant ($p < 0.05$). The knowledge score decreased with increasing duration of training. The higher the year of study, the more positive the participants' attitudes were. Only 12.9% of the participants had ever practised BLS. Twenty-one (21) participants (8.7%) expressed reluctance about performing BLS in a hospital setting, and 57.3% of the participants expressed reluctance about performing BLS in an out-of-hospital setting. Fear of acquiring infection, causing harm to the victim, and lack of confidence were the common causes for participants' reluctance.

Conclusions: The study reveals inadequate knowledge and practices related to BLS among students. The differences in knowledge and attitudes among students, depending on the year of study, point to the need for frequent refresher training and motivation of students.

Key words: Basic life support (BLS); Cardiopulmonary resuscitation (CPR); Knowledge, attitude, practices (KAP); medical students

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INTRODUCTION

Early initiation of Basic life support (BLS) with Cardiopulmonary resuscitation (CPR) is an important contributory factor in the survival of Cardiac arrest [1]. The fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early CPR, and rapid defibrillation with an automated external defibrillator (AED) [2]. Effective and timely CPR reduces the likelihood of death following sudden cardiac arrest [3].

Adequate knowledge and skills regarding BLS and appropriate application of the same is an essential requisite for medical students. Knowledge about BLS has been shown to influence primary assessment, treatment choices, decrease the delay in diagnosis and improve outcomes in cardiac arrest [4].

However studies conducted among medical personnel and students all over the world report less than satisfactory knowledge among this community. Chandrasekaran et al. [5] in their study demonstrated inadequate BLS knowledge among medical, dental and nursing students in a medical college in Tamil Nadu. Various studies also reveal that retention of knowledge and skills related to BLS deteriorates with increasing duration without periodic refresher training [6 - 8].

This study is an attempt to explore the knowledge and attitudes related to Basic Life Support among Undergraduate medical students in a Medical college of Tamil Nadu, India and identify the barriers preventing the application of the knowledge and skills in a required situation.

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted among undergraduate medical students of a medical college in Tamil Nadu during the period May 2012 to July 2012.

Based on a study by Chandrasekaran et al. [5] in a medical college in Tamil Nadu, where the proportion of medical students with at least 50% knowledge score for BLS was 17%, the required sample size was calculated to be 217, with an allowable absolute error of 5%. Assuming 10% non-response or incomplete response, the final sample size was approximated to 250. The students belonging to third, fifth and seventh semesters were chosen for the study, since all these students have undergone training in BLS at the beginning of third semester. The required sample size was then selected by simple random sampling using the list of above students as the sampling frame.

The study was approved by Institutional Ethics Committee. The participation was voluntary. A written, informed consent was obtained from all participants. Complete confidentiality was ensured.

A pre-tested, semi-structured questionnaire consisting of 3 parts was prepared. Part I consisted of 6 questions to assess the knowledge regarding Basic life support based on the American Heart Association Guidelines for BLS and CPR 2010 [2]. Part II was used to assess the attitude of the participants towards BLS. Part III was used to summarise the knowledge and attitude by enquiring their readiness or reluctance in performing BLS in a needy situation either in a hospital or in an out-of-hospital setting. Those who expressed reluctance in performing BLS were enquired about the reasons for their reluctance to identify the possible barriers.

The responses were recorded in Microsoft Office Excel 2007. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 16. Descriptive statistics were expressed in percentages. Knowledge and attitude score among the participants was expressed as mean and standard deviation. The mean scores among the students in different semesters of study were compared using one way ANOVA test followed by post-hoc analysis with Games Howell test. A P value of less than 0.05 was considered significant.

RESULTS

A total of 241 students participated in this study with a response rate of 96.4%. The distribution of students based on the semester of study is as follows: third semester 52 (21.6%), fifth semester 93 (38.6%) and seventh semester 96 (39.8%). All students had received Basic Life Support (BLS) training at the start of their third semester period. So the third, fifth and seventh semester students have received the training within 6 months, 1 year and 1 ½ years respectively. All of them were trained using the latest guidelines (American Heart Association Guidelines for BLS and CPR 2010). Table 1 shows the distribution of responses related to knowledge among the participants categorised based on the semester of study. The distribution of knowledge scores is shown in Table 2.

The mean knowledge score showed statistically significant difference among different semesters (third and fifth, $p < 0.05$; third and seventh, $p < 0.05$) on post-hoc analysis. The distribution of attitude responses on a Likert scale from “Definitely to Do not know” are summarised in Table 3.

Out of the 241 respondents, 194 expressed that lay persons should be trained in BLS. The distribution of positive attitude towards BLS training for lay-persons, based on semester of study was as follows: 37 participants (71.2%) in third, 75 participants (80.6%) in fifth and 82 participants (85.4%) in seventh semesters.

Table 1. Knowledge regarding BLS among the participants.

Frequency of participants who gave correct answer based on semester of study*				
Question	Total (N=241)	Third (n=52)	Fifth (n=93)	Seventh (n=96)
There are several things you need to do when you encounter a person in need of assistance. What should you do first? Answer: ensure scene safety (a)	187 (77.6)	46 (88.5)	65 (69.9)	76 (79.2)
Pulse check is an essential initial step before CPR. True or False? Answer: False (b)	199 (82.6)	47 (90.4)	77 (82.8)	75 (78.1)
Which of these methods would be appropriate to 'open the airway' of a child victim? Answer: Backward head tilt and chin lift	197 (81.7)	43 (82.7)	85 (91.4)	69 (71.9)
What is the recommended way to determine the location point for chest compressions? Answer: Find the centre of the chest	173 (71.8)	50 (96.2)	63 (67.7)	60 (62.5)
What is the recommended ratio of compressions to ventilations? Answer: 30: 2	183 (75.9)	52 (100)	78 (83.9)	53 (55.2)
What is the recommended depth of chest compression? Answer: at least 2 inches	158 (65.5)	41 (78.8)	49 (52.3)	68 (70.8)

* Percentages within parentheses

The responses for questions regarding attitude of the participants towards BLS were graded on a Likert scale from “Definitely to Don’t know” (grade 1 to 5), so that lower the score more positive the attitude. The scores are summarised in Table 4.

On post-hoc analysis, a statistically significant difference was noted among the mean attitude scores between third and seventh ($p < 0.05$); and fifth and seventh semesters ($p < 0.05$).

Only 31 participants (12.9%) had any experience in resuscitation in a real-life situation either inside or outside hospital.

To summarize the knowledge and attitude of the participants they were enquired about their readiness or reluctance in performing BLS in necessary situations either in hospital or outside hospital settings. 103 participants reported no reluctance in performing BLS in need either inside or outside hospital settings. 138 (57.3%) reported

reluctance in performing CPR outside hospital settings. The common causes reported for reluctance are shown in Table 5. Twenty one participants (8.7%) expressed reluctance in performing CPR in hospital. The reason reported was lack of confidence.

Table 2. Mean knowledge scores among the study participants.

Knowledge score	Frequency	Mean (Standard deviation)	P value
Total	241	4.55 (1.21)	
Third semester	52	5.37 (0.97)	F= 18.96 P< 0.05
Fifth semester	93	4.48 (1.09)	
Seventh semester	96	4.18 (1.24)	

Table 3. Attitudes towards BLS among study participants.

Distribution of attitude responses among participants**					
Questions related to attitude*	Definitely	Likely	Unlikely	Definitely not	Do not know
Are you confident of recognizing a person in need of basic life support?	127 (52.7)	85 (35.3)	7 (2.9)	3 (1.2)	19 (7.9)
Are you confident of providing chest compressions?	139 (57.7)	83 (34.4)	3 (1.2)	5 (2.1)	11 (4.6)
Are you confident of providing mouth-mouth ventilation (MMV)?	88 (36.5)	59 (24.5)	20 (8.3)	36 (14.9)	38 (15.8)
Are you willing to provide chest compressions to a stranger?	170 (70.5)	37 (15.4)	7 (2.9)	5 (2.1)	22 (9.1)
Will you be willing to provide mouth-mouth ventilation to a stranger?	49 (20.3)	43 (17.8)	23 (9.5)	82 (34)	44 (18.3)
Would you want other lay persons (trained in BLS) to try to resuscitate you if you are in need of BLS?	157 (65.1)	54 (22.4)	6 (2.5)	14 (5.8)	10 (4.1)

* Responses expressed as frequency; ** Percentage within parentheses

Table 4. Attitude score related to BLS among the study participants.

Attitude score	Frequency	Mean (Standard deviation)	P value
Total	241	11.83 (3.98)	
Third semester	52	12.63 (3.88)	F= 6.43 P=0.002
Fifth semester	93	12.53 (4.27)	
Seventh semester	96	10.73 (3.5)	

Table 5. Reasons for reluctance in performing BLS as reported by participants.

Reasons for reluctance	Frequency (N=138)*	Percentage
Fear of acquiring infection, during mouth-mouth ventilation	53	38.4%
Fear of causing harm or injury to the person	59	42.7%
Hesitancy in providing MMV to opposite sex	22	15.9%
Not willing to provide CPR for alcoholic patient	7	5.1%
Fear of Legal issues	37	26.8%
Difficulty without help from environment	19	13.8%
Fear of problems by relatives or bystanders	20	14.5%
Not confident	43	31.1%

* Multiple responses obtained.

DISCUSSION

Often the medical students are the first health care personnel who encounter emergency health situations in tertiary health care settings attached to medical colleges. Therefore, BLS knowledge and skills are essential for the medical students.

The mean knowledge score in our study was 4.55 (standard deviation: 1.21). Comparing the mean scores based on the semester of study, the mean score was highest among third semester students, followed by seventh semester and fifth semester in that order and this difference was statistically significant. The third semester students were the latest to receive BLS training (less than 6 months), and the seventh semester students had the highest duration of exposure to clinical specialities. Though no refresher training was provided, the clinical exposure could have been a positive factor for seventh semester students. Thus, the mean scores were related to the duration since BLS training and the duration of exposure to clinical specialities. This finding is similar to that reported by Roshana et al. [9] among the health care personnel in Nepal. Lesnik et al. [10] have reported similar reduction in retention of skills related to basic life support. The findings stress the need for refreshing the skills periodically. The refresher training is also important since these guidelines are updated or revised periodically. The need for optimal refresher training has also been stressed by Christopher et al. [11], Woollard et al. [12] and Chamberlain et al. [13]. Soar et al. [14] also recommended repeated refresher training, especially for individuals who are not practicing resuscitation on a regular basis.

In our study, 57.7% of the participants were confident of providing chest compression and 36.5% were confident of providing mouth to mouth ventilation. These figures are similar to that reported by Chew et al. [8] where though 85.8% were not confident in their resuscitation skills, more than half (57.1%) of the participants were confident in providing chest compression alone. Though 70.5% of the study participants were willing to provide chest compressions to stranger, only 20.3% of the participants were willing to provide mouth to mouth ventilation for a person in need of resuscitation. These figures are similar to that reported by Roshana et al. (27%) [9]. Our study reports a positive attitude among students regarding BLS training for lay persons, 80.5% of the participants felt that BLS training should be provided to lay persons also.

Only 12.9% ever practised resuscitation in a real-life setting, inside or outside hospital. 21 participants (8.7%) expressed reluctance in performing CPR in hospital and 138 participants (57.3%) reported reluctance in performing CPR outside hospital settings. The reasons for reluctance in providing resuscitation include risk of causing harm or injury to the victim, fear of spread of infection to self, lack of confidence, embarrassment. Roshana et al. [9] also reported similar reasons among the reluctant participants.

There are a few limitations in this study. This study was done in a single medical college. All the participants were trained in BLS. No comparison was done with those who had not undergone BLS training and those who had refresher training. So the results cannot be applied to medical students who did not undergo BLS training. None of the participants were engaged in active patient care. So despite the questions on attitude included assessment of their confidence in performing BLS, the study did not assess the practices and practical skills of the participants. Despite these limitations, our study provides an insight into the state of BLS training outcomes among students in our college and provides possible avenues for improving the outcomes.

CONCLUSIONS

The study reveals inadequate knowledge about BLS among the undergraduate medical students. The knowledge and attitude varied with the semester of study. Despite all students having been trained in BLS, a major proportion of them expressed lack of confidence in performing CPR in an out of hospital scenario. Periodical reinforcement and refresher training with skills assessment is needed.

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Conflicts of Interest

None of the authors have any conflict of interest.

Financial disclosure

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Authors' contributions

GM made substantial contributions to conception and design of study, acquisition of data, analysis and interpretation of data. KA supervised the concept and design, helped in literature search and contributed in producing drafts. RD supervised data compilation and production of all drafts. DJR periodically reviewed and revised the manuscript. All authors read and approved the final manuscript.

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