

# Knowledge, Attitude and Practice of Cardiopulmonary Resuscitation and Associated Factors in Ethiopian University Medical Students

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## Abstract

**Purpose:** Cardiopulmonary resuscitation is a lifesaving procedure, performed to preserve patients' life until further management is going to follow. Having basic knowledge of CPR will be a crucial task of medical care providers. This study was done to evaluate knowledge, attitude, and practice and associated factors among clinical year medical students.

**Participants and Methods:** Institutional based cross-sectional study was conducted to assess knowledge, attitude, practice and factors associated with cardiopulmonary resuscitation among clinical year medical students in Jimma University. A simple random sampling was used to assess the students. Structured questionnaire of a question about knowledge, attitude and practice of Cardiopulmonary resuscitation was used to collect the data. The collected data was filled on cleared for completeness, analyzed using SPSS windows version 16 and Chi-square and P-value was calculated. All P-values from 0.05 and below were considered significant.

**Results:** The total response rate for this study is 98%. About 93.3% of the respondents had good knowledge about CPR of which, fifth year (36.2%), fourth year (34.1%) and interns (23%) respectively. Among studied participants (80.7%) students were not practiced CPR.

**Conclusion:** Clinical year medical students had a better knowledge, attitude and practice score towards CPR. Overall, however, the majority of students' knowledge, attitude and practices toward to CPR in Jimma University were not sufficient, favorable and safe enough.

**Keywords:** Cardiopulmonary resuscitation; Medical students; Jimma University

**Abbreviations:** AHA: American Heart Association; ALS: Advanced Life Support; BLS: Basic Life Support; CBE: Community Based Education; CPR: Cardiopulmonary Resuscitation; HCW: Health Care Worker; ICU: Intensive Care Unit; JU: Jimma University; KAP: Knowledge, Attitude and Practice; MMV: Mouth to Mouth Ventilation

## Introduction

Cardiopulmonary resuscitation is an important medical procedure which is performed in an effort to manually preserved intact brain function until further measures are taken to restore normal spontaneous blood circulation and breathing in a person in cardiac arrest. It is a combination of rescue breathing and chest compression, which is delivered to the victims who are thought to be in cardiac arrest. Being important members of the health care team; medical students are deemed to pass the basic skills and expertise which are needed to perform CPR [1,2].

The ability to respond quickly and effectively to cardiac arrest situation rests on health care team and medical students being competent in emergency lifesaving procedure of cardiopulmonary resuscitation [1,2].

The American Heart Association (AHA) resuscitation guidelines recommend that all under graduated students who are in contact with the patients should have regular resuscitation training [1,3].

Early initiation of CPR can improve patient survival and neurologic outcome. Targeted education on Cardiopulmonary resuscitation for emergency care providers and the public has increased survival rate of the patients [2].

Cardiac arrest continues to be a major cause of premature death in much of the world today. Although the epidemiology of cardiac arrest

has been well studied in many developed countries, there are still no studies done on assessments of knowledge, attitude and practice on CPR in Jimma University. This study was emphasized on assessments of knowledge, attitude and practice on CPR, so it may provide baseline information for other researcher and health professional who are interested on same area. Besides this, it initiates responsible bodies to treat cardiac arrest patients in order to take action and further increment of awareness in JUSH.

In addition, this study had great importance in developing information for planners and programmers who can be used in tackling against cardiac arrest and its association by encouraging habit of CPR training and education in Jimma and its surrounding.

The study can also help to understand the value of life and the importance of communication and teamwork, as well as boost self-esteem.

## Material and Methods

### Study area and setting

The study was conducted in Jimma University. The University is

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located in Jimma town 352 km far from Addis Ababa in the southwest direction. It is one of the senior universities in Ethiopia where health, and many other professionals of different disciplines have been trained and educated. Currently, 1200 students are learning medicine from first year to final year in 2013/14 academic year of which 532 are fourth, fifth and sixth years. A Study was conducted from June, 05-09, 2014.

### Study design

Institutional based cross sectional study design was employed.

### Sample size determination

The sample size was determined by single population proportion formula using  $p=0.5$ ,

Final sample size=243 including 10 contingency.

### Sampling technique

A simple random sampling was used to assess KAP of clinical year students. Thus study was done on 243 students considering 10% non-response rate. All students from 4<sup>th</sup> to 6<sup>th</sup> year in JU=532 (Flow Chart 1).

### Inclusion criteria

1. Clinical year medical Students
2. Students who were practicing in the hospital at the time of data collection

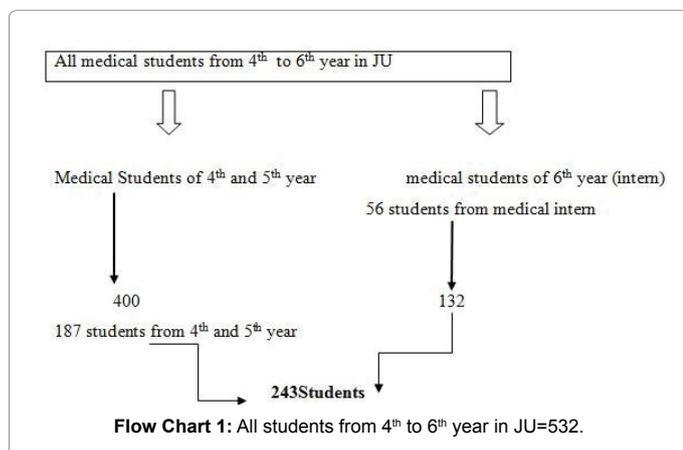
### Exclusion criteria

1. Not willing to participate in the study.
2. Severely ill students during data collection time

### Data collection technique and data analysis

Data collection was carried out by formatted questionnaire, which consisting of general information and self-designed KAP questionnaire. The response was circled or written with pen in provided space. The data was collected in collaboration with the principal investigator and other three third-year anesthesia students, just after training on the topic and how to collect the data was given. After the study was conducted the collected data was filled on prepared tally sheet and analyzed using different materials, and for categorical variables' Chi-square and P-value was implemented. P- Values < 0.05 were considered significant.

### Ethical approval



The data was collected after the formal letter of cooperation detailing the purpose of study is sent from Jimma University Community Based Education coordinating office to the college health sciences. The purpose of study was explained to study subject to avoid ambiguity and misunderstanding. Moreover, individual was asked to fill questionnaires after verbal consent was obtained.

### Operational definition

1. Attitude: It refers to correct response of under graduating students regarding to CPR for selected emergencies to the structured attitude questionnaire prepared by the investigator for study.
2. Advanced life support: Is cardiopulmonary resuscitation technique that is performed after Basic Life Support (BLS) is maintained using electronic device and drugs.
3. Basic life support: Maintaining air way, breathing and circulation for patients with cardiac arrest without drug administration.
4. Knowledge: Respondent who answers >60% total knowledge question have sufficient knowledge and <40% has insufficient knowledge about CPR.
5. Practice: It refers to academic application of knowledge and skills on CPR.

### Results

Two hundred thirty eight (238) 4<sup>th</sup> year and above medical students with respondent rate of 98% were found valid and included in data compilation. Majority of 4<sup>th</sup> and above year medical students range between age of 20-25 (60.8%), and the rests are above 26. Most of them are males (51.6%) and among these 4<sup>th</sup> year 39.5%, 5<sup>th</sup> year (37%) and (23.5%) interns (Table 1).

About 95.7% of the respondents knew about CPR; fifth year (34.2%), (36.2%) 4<sup>th</sup> year and (23.5%) interns respectively (Figure 1).

Most of the sampled students had a good knowledge about CPR which 83.3% were males. No significant association indicated among sex, age distribution and knowledge of CPR of students as  $p$  value is  $\geq 0.05$ , but as study indicates there was significant association between academic year, source of information of CPR and knowledge of CPR as  $p$  value is less than 0.05 (Table 2).

Majority of sampled students got their knowledge from video assisted lecture at class (50.40%), followed by you tube, which accounts 21.5% and 5% of them got from movies (Figure 2).

As study showed about 79.8% of respondents had identified cardiac and respiratory arrests were the major indication of CPR. 15.2% of them were identified apparent sudden death as an indication of CPR. Only 84.4% of participants knew BLS and ALS as a component of CPR. 9.5%, 4.9% of them knew BLS and ALS respectively (Figures 3 and 4).

All of participants were agreed whether graduating medical students should have major role in helping patients face sudden emergency events and give a basic idea of CPR technique to their fellow students. 98.8% of them had support, including and technique of CPR in the JU curriculum. 47.3% of disagreed University does its best in spreading awareness about technique of CPR (Tables 3 and 4).

93.8% of the respondents found to have positive attitude as compared to 7.4% of respondents noticed with negative attitude. Attitude level among all age, academic year and source of information found to be statistically significant (as  $p$  value is less than 0.05). However,

Variables	Categories	Sex				Total	%
		M	%	F	%		
Age	20-25	123	52	22	9.2	145	61
	≥26	88	37	5	2.1	93	39
	Total	211	89	27	11	238	100
Academic years	4 <sup>th</sup> year	86	36	8	3.4	94	40
	5 <sup>th</sup> year	80	34	8	3.4	88	37
	Intern(6yr)	40	16	16	6.7	56	24

Table 1: Socio demographic characteristics of medical students.

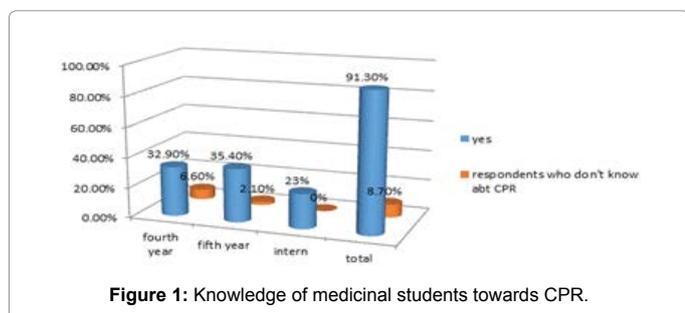


Figure 1: Knowledge of medicinal students towards CPR.

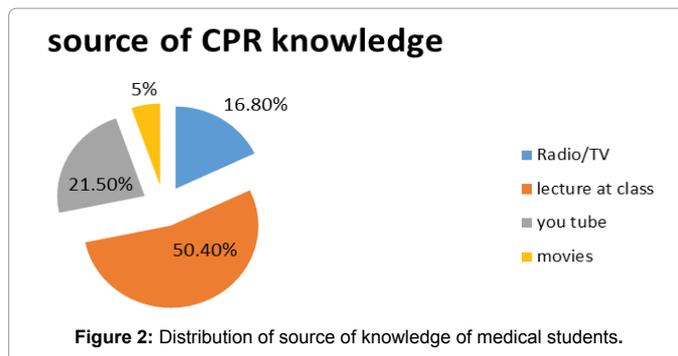


Figure 2: Distribution of source of knowledge of medical students.

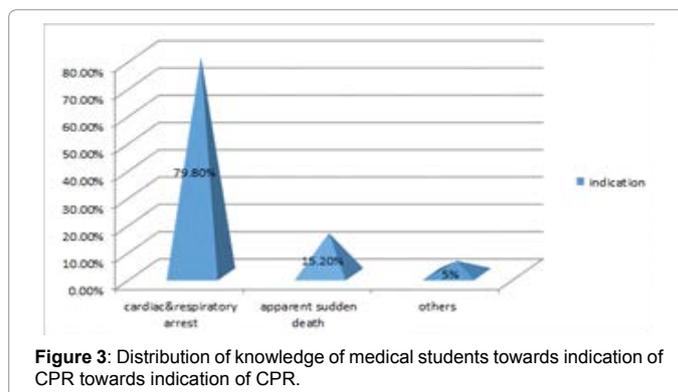


Figure 3: Distribution of knowledge of medical students towards indication of CPR.

Variables	Categories	Knowledge				Remark
		Good knowledge	%	Poor knowledge	%	
Age	22-25	135	57	10	4.2	Chi-sq=10.22 P value= 0.006 Df=2
	≥26	87	37	6	2.5	
	Total	222	93	16	6.7	
Sex	Male	200	83	11	5.3	
	Female	22	10	5	1.4	
	Total	222	94	16	6.7	
Academic year	Fourth	83	34	11	5.3	
	Fifth	85	36	3	1.4	
	Intern(sixth)	56	24	0	0	
Source of information	Radio and TV	38	16	2	0.8	
	You tube	47	21	3	0	
	Video assisted lecture	115	48	5	1.2	
	Movies	8	3.3	4	1.6	

Table 2: Distribution of association between socio demographic characteristics and knowledge about CPR among medical students.

no significant association between sex and attitude of students towards to CPR (Table 5).

The above table reveals that the majority of respondents (63%) were willing to do CC and MMV. Of which fifth year (29.6%), interns (19.8%) and fourth year (13.6%). 26.3% participants were ready to perform CC and 10.7% were willing to perform MMV (Table 6).

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%). Nearly 84% participants state that lack of confidence is one factor affecting practice of CPR. There is significant association between lack of training, inadequate information, lack of confidence,

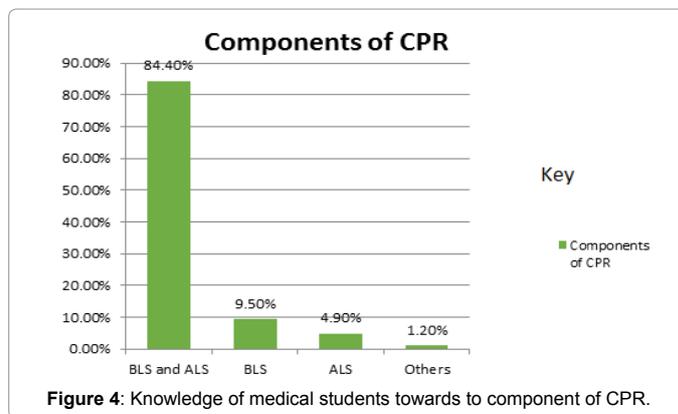


Figure 4: Knowledge of medical students towards to component of CPR.

Poor exposure and practice of CPR as p value is less than 0.05 (Table 7).

A total of 19.7% of medical students' practice CPR of which 2.5% fifth year, 16.8% were interns whereas the rest is fourth year. A total of 196 (80.3%) students didn't practice CPR (Figure 5).

## Discussion

The findings of study were discussed in the light of previous study. This was conducted to assess knowledge, attitude, practice and associating factors with CPR in Jimma University.

Even though Immediate response to a cardiac arrest challenging in resource limited and developing countries, having the basic knowledge, skill and attitude is an essential part of medical service providers [1].

About (227) 93.3% of the respondents had excellent knowledge about CPR with which, fifth year 88(36.1%), 83(34.2%) and 56(23%) fourth year, and interns respectively. 6.7% of them had poor knowledge.

S. no	Attitude	Agree	%	Disagree	%
1	I think under graduating medical students should have major role in helping patients face sudden events	238	100	-	-
2	If I had a good knowledge of CPR I could not hesitate to use it whenever it was needed	234	98.4	4	1.6
3	I support including and technique of CPR in the JU curriculum	235	98.8	3	1.2
4	I would like to give a basic idea of CPR technique to my fellow students	235	100	-	-
5	I think my University does its best in spreading awareness about technique of CPR	128	52.7	11	47.3

Table 3: Academic year distribution of fourth year and above medicine students attitude towards to CPR.

Year of study	Importance resuscitation training before graduation		Not important	%
	Important	%		
Fourth	92	39	2	1
Fifth	87	37	1	1
Sixth	56	24	0	0
Total	235	98		2

Table 4: Distribution of medical student's attitude towards CPR.

Variables	Categories	Attitude				Remark
		Positive attitude	%	Negative attitude	%	
Age	22-25	143	54	2	7	Chi-sq=13.15 P value=0.0014 Df=2
	≥26	80	38	13	1	
	Total	223	94	15	7	
Sex	Male	200	82	11	5	
	Female	23	9.5	4	2	
	Total	223	94	15	7	
Academic year	Fourth(C1)	81	33	13	6	
	Fifth(C2)	85	38	3	1	
	6 <sup>th</sup> (Interns)	56	23	0	0	
Source of information	Radio and TV	35	14	5	2	
	You tube	46	19	4		
	Video assisted lecture	115	48	5	1	
	Movies	10	4.1	2	1	

Table 5: Distribution of association between socio demographic characteristics and attitude towards CPR.

Study conducted on 35 personnel of CPR in a hospital at the Golestan University of Medical Sciences, 2007 in the Northeast of Iran implies the CPR personnel had a good knowledge before education (57%), and it improved significantly to 92% after the lectures and to 94% 2-months later, in all items related to basic and advanced CPR [4]. This study showed a similar significant effect of education on the knowledge of health-care workers and under graduated medical personnel about CPR. The knowledge of the respondents in our University is somewhat higher compared to other studies. However, the knowledge clinical year and graduated medical students need to be improved regarding this

Year of study	Willingness to do CC and MMV					
	CC only		MMV only		CC and MMV	
	No.	%	No.	%	No.	%
Fourth	53	22	10	4.1	33	14
Fifth	8	3.3	11	4.5	72	30
Sixth	3	1.2	5	2.1	48	20
Total	64	26	26	11	153	63

Table 6:- Academic year distribution of medical students willingness to do CC and Mouth to mouth Ventilation.

Factors	practice of CPR				Remark
	Yes	%	No	%	
Lack of training	235	99	3	1.3	Chi sq 96.99; P value=<0.0001
Inadequate information	191	80	48	20	
poor exposure	223	94	15	6.4	
Lack of confidence	200	84	38	16	
Lack of willing	167	70	71	30	

Table 7: Perceived factors associated with Practice of CPR of medical students.

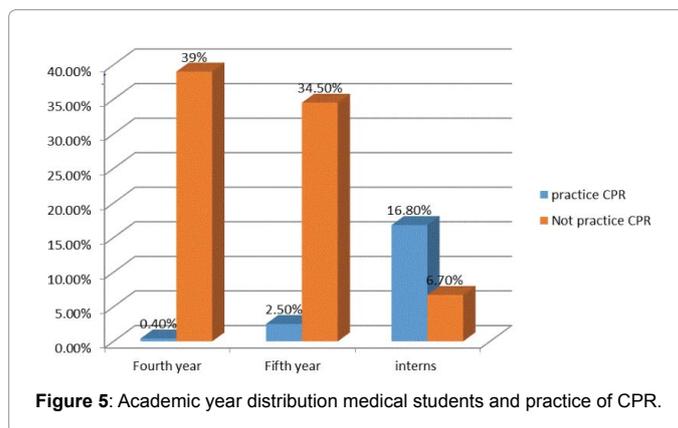


Figure 5: Academic year distribution medical students and practice of CPR.

aspect in our University by further enhancing information about CPR.

Almost all of respondents (98.3%) belief that CPR training before graduation is important, which is higher when compared to study done in Singapore, which accounts 85.5 [5]. 93.8% of the respondents found to be positive attitude as compared to 7.4% of respondents noticed with negative attitude. Hence, awareness about importance of CPR before graduation needs to be encouraged in our hospital, and more emphasis should be given to them.

In this study, a total of 19.7% of medical students were practicing CPR of which 2.5% fifth year; 16.8% were interns whereas the rest is fourth year. In all 196 (80.7%) students were not practicing CPR.

According to study done by Suzuki et al the levels of knowledge in 3305 Japanese medical students and showed that less than 20% of them could perform standard CPR [6]. Other close studies confirmed this, too [7,8]. Alike study also done in six colleges of Karachi in Pakistan on medical and para medical students' shows that (20%) medical students report that they didn't know how to perform CPR and (47.8%) answered incorrectly to question how to do CPR. Only 32.2% of medical students know how to do appropriately [9]. Hence,

the practice of the respondents in our University is comparable to these studies. So, the practice of the medical students needs to be improved regarding this aspect in our University. If we think that medical care providers have never performed CPR, in reality, it will be difficult to perform CPR without knowing anything about in what way and for what reasons it should be performed. With theoretical knowledge, a healthcare professional may be able to perform CPR sufficiently. The reasons for not practice CPR lack of training followed by poor exposure time.

In this study, the respondents (63%) were willing to do chest compression and mouth to mouth ventilation. Of which 29.6% fifth year, 19.8% intern and 13.6% are fourth years. Only 26.3% participants were not opposed to performing CC and 10.7% were not opposed to performing mouth to mouth ventilation. Similar study conducted at Asahikawa Medical College Hospital a sample size of total 4223 individual (male 50%) completed the questionnaire, including high-school students, teachers, emergency medical technicians, medical nurses and medical students, showed that about 70% the subject had experienced CPR training more than once providers reported willingness performing Chest Compression (CC) and Mouth to Mouth Ventilation (MMV) on a stranger or trauma victim. The study was included with most People, and health care providers are unlikely to perform CC plus MMU, remarkably on a stranger and low trauma victim, but are more likely to perform CC only [10]. The willingness to perform CPR may be facilitated by education. Having said that, it is important for clinical year and undergraduate medical students should regularly participate in CPR courses and update their knowledge.

In this study 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 state that lack of confidence is one factor affecting practice of CPR, which is similar with study done in Korea which nurses need trainings within four months otherwise they forget [11].

## Conclusion

Overall, the majority of students' knowledge, attitude and practices toward CPR in Jimma University were not sufficient, favorable and safe enough.

Most of the participants got, their knowledge from video assisted lecture at class, followed by you tube. The majority of respondents were eager for do chest compression and Mouth to mouth ventilation. Most of the studied participants didn't practice CPR. Most of the respondents had identified cardiac and respiratory arrests were the major indication of CPR. Overall, Majority of participants had positive attitude about CPR, still it is not sufficiently as CPR is a life-saving measure that every health personnel be quite sure to do it. So as training is a significant factor which reinforces students to initiate CPR.

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## Author Contributions

Mr. Wedajo, Mr. Million and Mr. Mengistu initiated the idea of the study. All the authors were involved in the study design, conduct, analysis, and manuscript preparation. All authors read and approved the final manuscript.

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