

Perception of Knowledge and Level of Preparedness towards Cardio Pulmonary Resuscitation (CPR) Among Physicians in a Tertiary Care Centre of Eastern India

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ABSTRACT

INTRODUCTION: Cardiopulmonary resuscitation is the main stay of treatment to revive patient who are in cardiac arrest and traditionally it was conducted under the supervision of emergency, critical care and anesthesia department. Knowledge of CPR and preparedness towards CPR among other specialty remains questionable. It has been observed through there are ample of data from developed countries but there is a paucity of work in developing countries regarding the same.

OBJECTIVE: To assess the knowledge and level of preparedness and to assess the perception towards cardiopulmonary resuscitation among physicians and to determine factors influencing the same and the recommendation for further improvement.

METHODOLOGY: This cross-sectional questionnaire-based study was conducted using a sample of 41 physicians employed in different specialties of Medica super specialty hospital using a pre validated questionnaire for a period of 12 months. Fischer exact test or Chi Kolmogorove -Smirnov analysis has been used to check if data is following the normal distribution. Pearson's correlation analysis or Spearman's rank correlation analysis has been used to assess correlation between two variables.

RESULT : 41 physicians responded among 80 contacted (n=41, response rate= 51.25%). In our study The mean age of the participants was 39.46 (± 9.01) years with a median of 38 years. The age ranged from 25 to 64 years. 75.6% of the respondents were males. Major group of participants are belonged to emergency medicine (29.3%) followed by non-interventional cardiology. 43.9% of study populations are holding doctor level medical degree. 39% of study population is holding ACLS /BLS certification. 100% of physician of study population are being aware of importance of CPR and 73.2% are keen to take part in CPR awareness programme. Most of the physicians (75.6%) believe teaching and mastering CPR intervention should be made mandatory to all medical undergraduates. There was no significant association of specialty, highest qualification, years of experience or presence of ATLS certification with score on question regarding main purpose of CPR. There was a significant association of score on this question with presence of ACLS/BLS Certification, with all respondents who possessed ACLS/BLS certification answering all options correctly.

CONCLUSION : The study showed variable level of perception of knowledge and level of preparedness towards cardiopulmonary resuscitation among physicians and there are no single variable or determined factor for above. Though the study indicates there is correlation between the ACLS/BLS/ALS certification and knowledge of CPR further study and evaluation is needed in context of developing countries. It is **also recommended** a refresher course intending towards last years of medical school would be beneficial regarding knowledge of CPR.

KEYWORDS: 'Cardio pulmonary resuscitation', 'physician', 'knowledge', 'preparedness', 'perception', 'factors'

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INTRODUCTION

Life threatening events including sudden cardiac death (SCD) may occur to anyone anytime and anywhere. Sudden cardiac death (SCD) is defined by the World Health Organization (WHO) as that condition which occurs within the first 24 hours after the symptoms onset¹ however there is marked variability of time frame for describing sudden cardiac arrest. Sudden cardiac arrest is a significant problem occurring all over the world and accounted for 15-20% of all mortality.² More than 30 millions sudden cardiac death occurs all over the world with success rate less than 8%.³ There may be various aetiologies behind the event like ventricular tachyarrhythmia, brady arrhythmia, electrolyte abnormalities, genetic predisposition, hypoxia and others⁴, however the terminal care remains same in spite of variant aetiology.

All over the world cardio-pulmonary resuscitation (CPR) is the mainstay of intervention for cardiac arrest victim and physicians should have basic minimum knowledge about CPR to save life of patient. In 1992 international committee on resuscitation (ILCOR) was formed and AHA introduced first CPR course on 2005. In a recent systemic review, Mykles et al showed that 38.6% of the patients of age 70 years or more had return of spontaneous circulation in case of sudden cardiac arrest who received CPR. However 50% of patient survived on initial resuscitation died during hospital stay. The pooled survival to discharge after intra hospital CPR was 18.7% (patients between 70 and 79 years old), 15.4% (patients between 80 and 89 years old), 11.6% (patients of 90 years and older)⁵

In India classical training of CPR has never been included in undergraduate as well as post graduate programme. A previous study done in tertiary care hospital in south India indicates that knowledge about basic life support among medical, dental, nursing students, interns and residents are not optimal⁶. Another study done among medical students in south sub coastal India showed there is a need of education regarding CPR and BLS and it should be taught early in the curriculum⁷. Though CPR is an emergent life saving procedure during care of cardiac arrest victims in both intra and out of hospital settings, the knowledge of CPR remains questionable among physician⁸. In a previous study done in city of Salvador (Brazil) it was showed that those who attended ACLS training have higher knowledge than and cardiologist who attended ACLS training were giving better care to cardiac arrest patient in comparison to other speciality taken together⁹

A study conducted in Japan in which a total of 1132 (47%) completed the questionnaires concluded that for their families and friends only 13% of them willing to attempt bystander CPR. For strangers the percentage has come down to 7% only. It was shown that there is a positive correlation between

CPR training, experience in CPR procedure and willingness for bystander CPR¹⁰. Another study that was published in The new England journal of medicine concluded that “the survival rates in study are significantly higher than the most optimistic survival rates in the medical literature, and the portrayal of CPR on television may lead the viewing public to have an unrealistic impression of CPR and its chances for success”¹¹. So physician who intended to give CPR should explain the patient's relatives the consequence and the success rate. It is always being shown as highly effective and successful in films and television however ground reality differs depending on clinical conditions, time of CPR initiation and appropriate delivery of high quality CPR which requires basic knowledge, ability and intends to perform.

The basic aim of the study is to assess the perception of knowledge, level of preparedness and attitude of physicians towards CPR as competency is never been possible without the above. Moreover in tertiary care physicians are more inclined towards their own specialities and sub specialities which may add more complexity. In a previous study it has been concluded that the physicians working at emergency and anaesthesia achieved highest score¹².

Mani G, Annadurai et al. has done a study on medical students of Tamilnadu to assess the knowledge of basic life support on 2014 and 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 students¹³

Another study done at Salvador, Brazil regarding general knowledge of emergency physician for care of cardiac arrest patient showed theoretical knowledge on CPR was higher among physicians who had attended the ACLS course, as opposed to those who had attended the ATLS course. Cardiologists who had attended the ACLS demonstrated a higher theoretical on the care of cardiac arrest patients when compared to physicians from other specialties taken as whole— Internal Medicine, Surgery, and Orthopaedics¹⁴

In Ethiopia another study has been done among university medical students regarding knowledge, attitude and practice of cardio pulmonary resuscitation showed clinical year 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, and safe enough¹⁵.

Another study done at Jamaica West Indies showed Physician Knowledge of CPR protocols were below optimal level and current certification levels were low. Increased training and recertification is necessary to improve physician

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knowledge which is expected to result in improved performance of CPR¹²

In Bangalore city (India) a study was done for assessment of Knowledge and attitude of cardio pulmonary resuscitation among dental interns and post graduate students showed study population had average knowledge about BLS¹⁶.

Study done at Osun state Nigeria showed most of the medical practitioners in Osun State were not knowledgeable about cardiopulmonary resuscitation and defibrillation. Few with the knowledge were from the tertiary institutions. Therefore there is a need for the creation of more awareness within medical practitioners, especially among those outside tertiary health facilities¹⁷. Another study done In Israel suggested that primary care physicians are under prepared to imitate life saving services including CPR and step should be taken to rectify the situation though a larger study was also recommended to access further¹⁸

A recent study done in Egypt among medical students showed that the average knowledge is poor. Introduction to BLS course in undergraduate curriculum is must to increase the knowledge about BLS. A total of 823 medical students with the mean age of 20.3 ± 2.7 years, completed the questionnaire (463 and 360 in academic and clinical years, respectively). About 72% and 84% of students failed to recognize the proper location of chest compression in adults and infants respectively. Moreover, the majority (80%) did not know how to initiate rescue breathing in infants. Only 18% of students correctly recognized early signs of shock and only 22% knew how to treat patients with myocardial infarctions. It was concluded that being in clinical years, previous BLS training or practical experience were significantly associated with higher BLS knowledge scores ($p < 0.001$)¹⁹. In an study done at Riyadh, of Saudi Arabia regarding the impact on the attitudes of health-care workers toward cardiopulmonary resuscitation and defibrillation concluded that repeated educational courses improve attitude towards CPR performance and use of defibrillation²⁰. In another study done in Denmark (2017), in total, 93 physicians (53% male) from 45 hospitals participated in the study with median age of 34 (inter quartile range: 30–39) years. Participants were medical students working as locum physicians (5%), physicians in training (79%) and consultants (16%), and median postgraduate clinical experience was 48 (19–87) months. Most respondents (92%) felt confident in treating cardiac arrest victims, while fewer respondents felt confident in performing endo-tracheal intubation (41%) and focused cardiac ultrasound (39%) during cardiac arrest. Median time since last CPR training was 4 (2–10) months, and 48% had completed European Resuscitation Council (ERC) Advanced Life Support course. The majority (84%) felt confident in terminating resuscitation; however, only 9% were able to state the ERC guidelines about it.²¹

Similar study was done at north eastern part of India among junior doctors and interns showed study population have scored poorly as compared to trained participants in theoretical knowledge and practice of BLS (24.36 % and 53.45% versus 9.25 % and 24.07%) respectively. The mean score for both theoretical knowledge and practice of BLS for trained students was higher than that of the other participants and the statistical difference was highly significant (<0.0001). Most of the participants both trained and untrained group) were having very good attitude towards BLS²²

METHODOLOGY

Ethical approval was obtained from the ethics committee of the tertiary care hospital where the proposed study was carried out: Department of Emergency Medicine Medica Hospital, Kolkata, India. The study was designed as a self-reported, cross-sectional, survey based close ended questionnaire study. The questionnaire designed to elicit information about

- A) General questions to know the importance of cardiopulmonary resuscitation (CPR) in clinical practice
- B). Indications, Methods and Effectiveness of Cardiopulmonary Resuscitation

.Some questions were in the multiple choice format, others were close-ended,. Statistical software SPSS version 23 has been used for the analysis. Data have been charted in MS excel spread sheets and analysis has been carried out through statistical tools. Procedures of the data analysis included transcription, preliminary data inspection and interpretation. Groups were being compared by demographic characteristics. Data has expressed as mean \pm S.D. depending on distribution of data and as percentage. Sample size was calculated based on previous studies^{12,13,14,15}

DATA COLLECTION

The study was done within Medica Super specialty hospitals in India which have fully operational multispecialty department from March 2018 to February 2019. By doing this study in this hospital which has interacting multi and super speciality with consultants of other specialties, It is thought that a proper and genuine feedback can be obtained from physicians about the perception and level of preparedness among physicians towards cardiopulmonary resuscitation working in tertiary care hospital in eastern India & about the factors that influence it in our country. A computer generated randomised employee number of 80 physician were generated and being contacted with pre validated questioner and out which 41 have replied (n=41 response rate=51%).

Inclusion criteria:

Physicians of different specialty who are working in the mentioned tertiary care hospital in clinical capacity and having experience more than 1 year which includes clinical

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director, consultant, associate and attending consultants, senior registrars and medical officers.

Exclusion criteria

Physicians having less than 1 year experience and those who are working in lab services and administrative capacity.

STATISTICAL ANALYSIS AND RESULT

For statistical analysis the questions have been divided into two main parts. First one only contains demographic data and second one has three parts:

.A) This part represents the general statement regarding the importance of CPR and it consists of 8 questions and the

response was recorded as yes/no/do not know. B) It consists of 4 questions and the main aim to assess the knowledge about main goal and accuracy of cardiopulmonary resuscitation (CPR) intervention in which multiple options are given and any number of options can be chosen C) part consists of 14 question in which response has been recorded as yes/no/ do not know .and a scoring system along with association of demographic data was being used to recognise the cognitive assessment regarding CPR.

All computations and statistical analysis are done using MS Excel.

Table 1. Age Distribution of the Participants

	Mean	Median	SD	Minimum	Maximum
Age (Years)	39.46	38.00	9.01	25	64

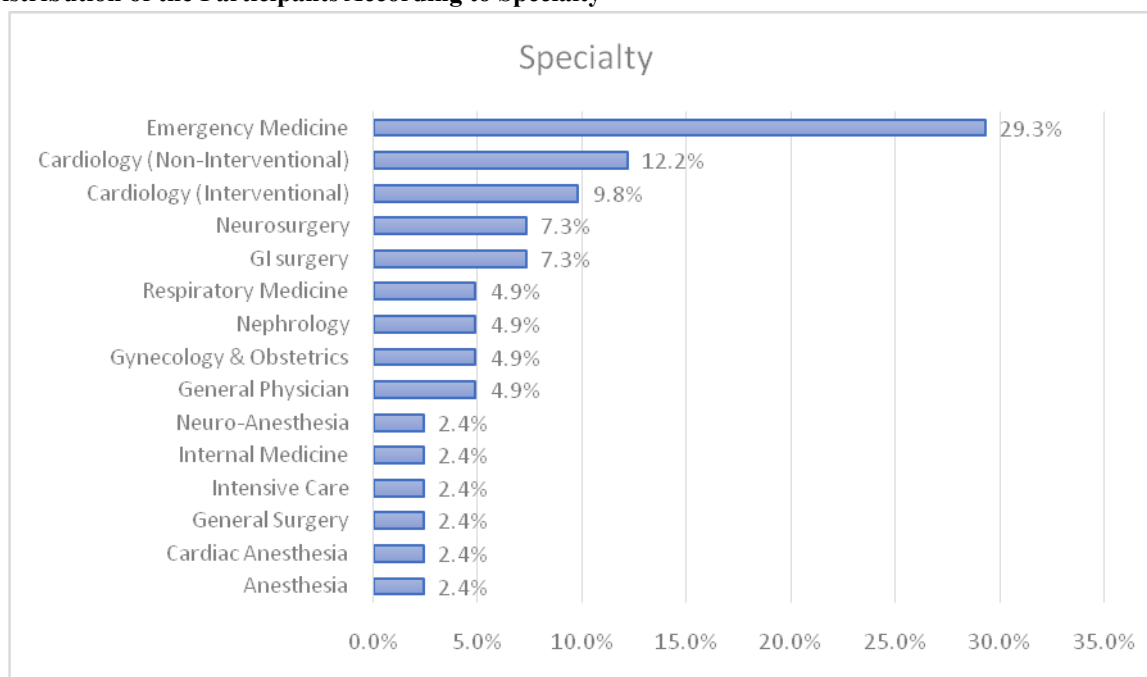
The mean age of the participants was 39.46 (± 9.01) years with a median of 38 years. The age ranged from 25-64 years.

Gender	Frequency	Percentage
Males	31	75.6%
Females	10	24.4%

Table 2. Gender Distribution of the Participants

75.6% of the respondents were males.

Table 3. Distribution of the Participants According to Specialty



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Table 4. Distribution of the Participants According to Highest Qualification

The majority of the participants (43.9%) held a doctoral/equivalent qualification.

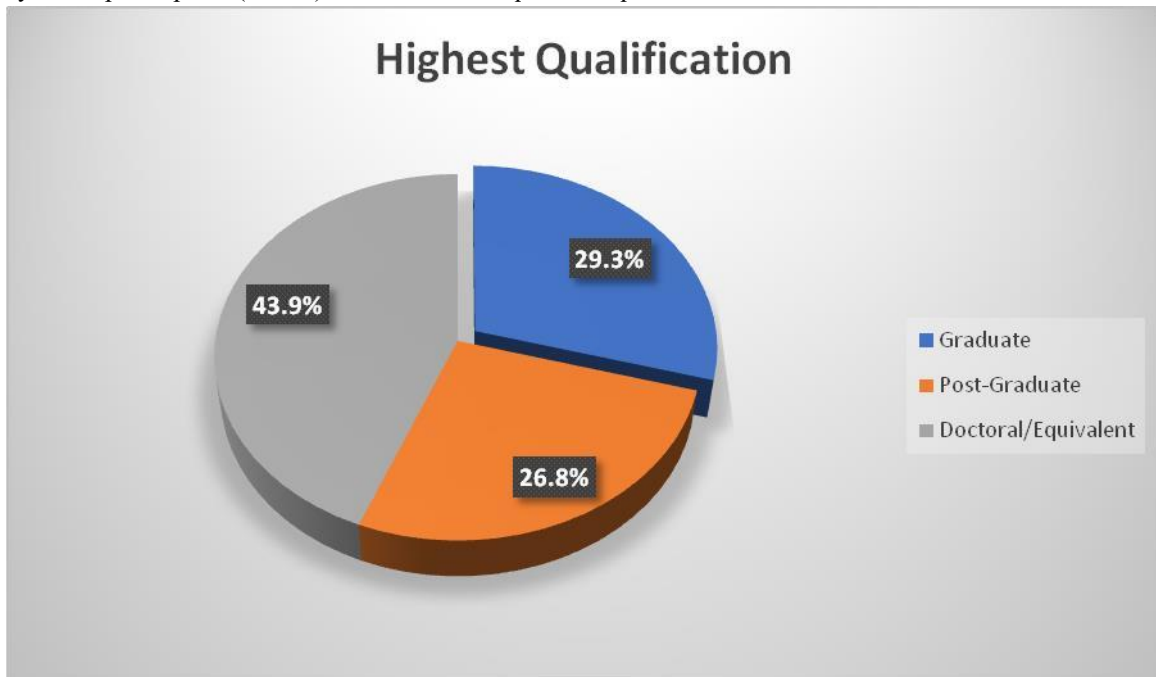


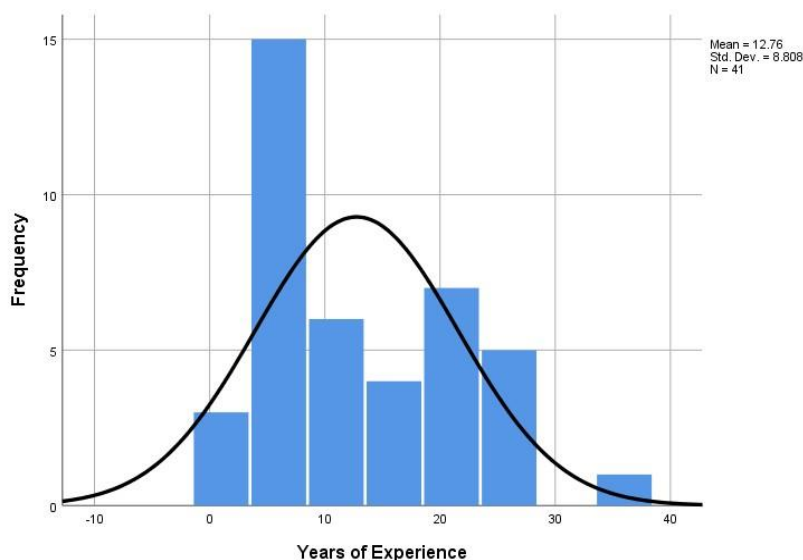
Table 5. Distribution of the Participants According to Years of Experience

	Mean	Median	SD	Minimum	Maximum
Years of Experience	12.76	10.00	8.81	1	35

The mean years of experience of the participants was 12.76 (± 8.81) years with a median of 10 years. The years of experience ranged

ACLS/BLS Certification	Frequency	Percentage
Present	16	39.0%
Expired	1	2.4%
Absent	24	58.5%

from 1-35 years.



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Table 6. Distribution of the Participants According to ACLS/BLS Certification

ATLS Certification	Frequency	Percentage
Present	8	19.5%
Expired	2	4.9%
Absent	31	75.6%

Majority of the respondents (58.5%) did not have ACLS/BLS certification.

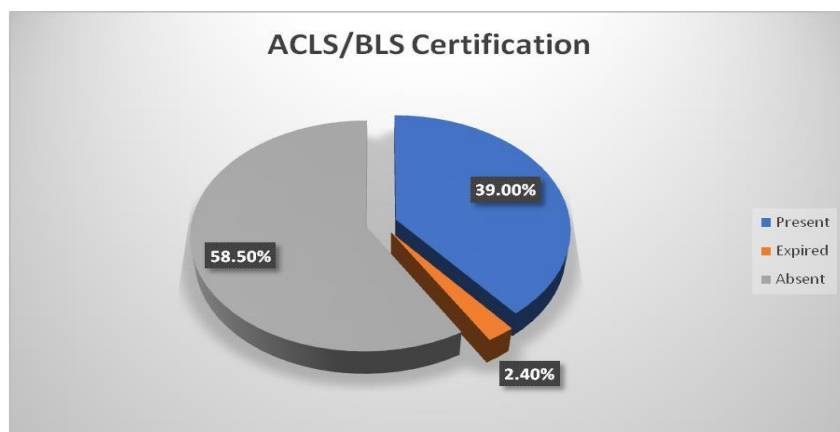


Table 7. Distribution of the Participants According to ATLS Certification

Majority of the respondents (75.6%) did not have ATLS certification.

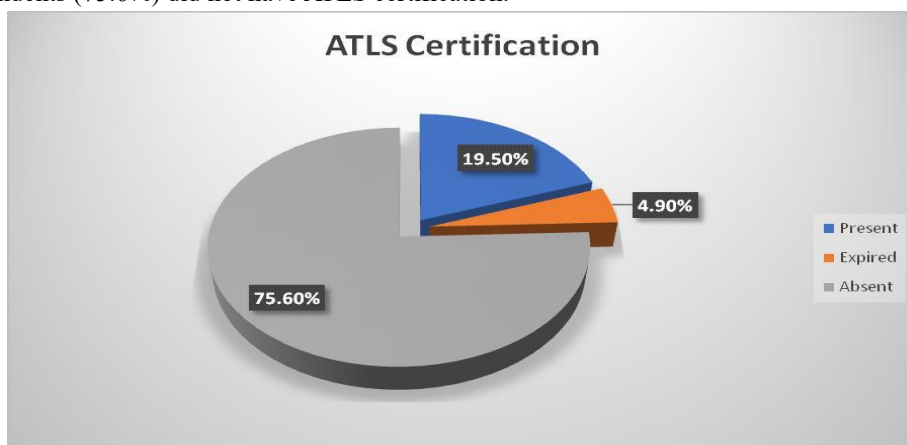


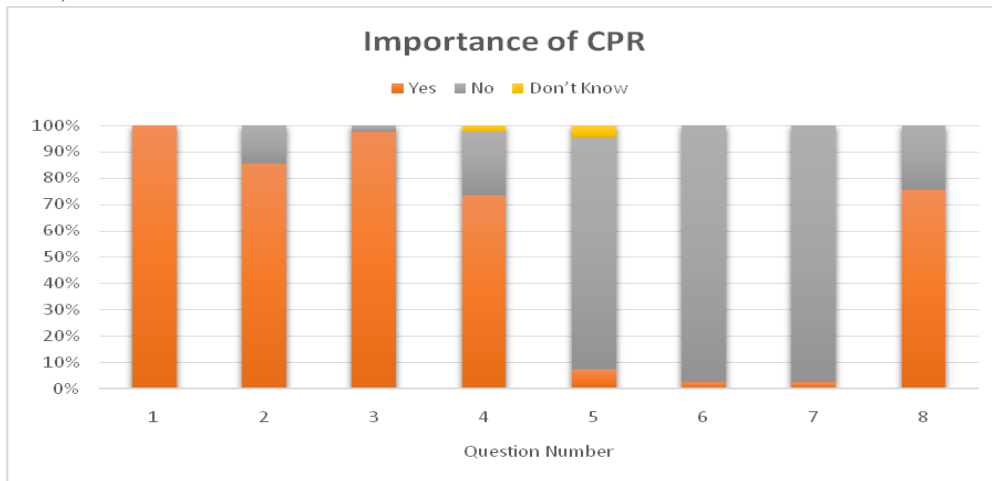
Table 8. Response to the General Statements Regarding the Importance of Cardiopulmonary Resuscitation in Clinical Practice (n = 41)

Q. No.	Question	Yes		No		Don't Know	
		N	%	N	%	N	%
1	I am aware about importance of CPR in clinical practice	41	100.0 %	0	0.0%	0	0.0%
2	According to me, knowledge about correct CPR procedure is mandatory to all health care professionals, and it should be made compulsory	35	85.4 %	6	14.6 %	0	0.0%
3	I believe CPR is a basic emergency need for the betterment of mankind and health status	40	97.6 %	1	2.4%	0	0.0%
4	I would like to participate in CPR awareness programs and have lifesaving experience	30	73.2 %	10	24.4 %	1	2.4%

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5	I believe CPR procedures are arduous, unethical, incorrect and purely inhuman	3	7.3%	36	87.8 %	2	4.9%
6	Rather than being beneficial, it is more harmful to the patients	1	2.4%	40	97.6 %	0	0.0%
7	Conducting CPR is simply a waste of manpower and time	1	2.4%	40	97.6 %	0	0.0%
8	Teaching and mastering CPR intervention should be made mandatory to all medical undergraduates	31	75.6 %	10	24.4 %	0	0.0%

The above table summarizes the response to the general statements regarding the importance of cardiopulmonary resuscitation in clinical practice (n = 41).



Participant Characteristics		Main Purpose of CPR						Total		ChiSquare Test	
		0-2 Correct Answers		3-5 Correct Answers		All Correct Answers					
		N	%	N	%	N	%	N	%	χ^2	p
Specialty	Emergency Medicine	1	8.3%	2	16.7%	9	75.0%	12	100.0%	5.353	0.253
	Cardiology	0	0.0%	0	0.0%	9	100.0%	9	100.0%		
	Others	4	20.0%	4	20.0%	12	60.0%	20	100.0%		
Highest Qualification	Graduate	3	25.0%	2	16.7%	7	58.3%	12	100.0%	3.779	0.437
	Post-Graduate	0	0.0%	2	18.2%	9	81.8%	11	100.0%		
	Doctoral/Equivalent	2	11.1%	2	11.1%	14	77.8%	18	100.0%		
Years of Experience	1-5 Years	1	8.3%	3	25.0%	8	66.7%	12	100.0%	7.023	0.135
	6-10 Years	0	0.0%	0	0.0%	11	100.0%	11	100.0%		
	>10 Years	4	22.2%	3	16.7%	11	61.1%	18	100.0%		
ACLS/BLS Certification	Yes	0	0.0%	0	0.0%	17	100.0%	17	100.0%	10.649	0.005
	None	5	20.8%	6	25.0%	13	54.2%	24	100.0%		
ATLS Certification	Yes	0	0.0%	1	10.0%	9	90.0%	10	100.0%	2.31	0.31
	None	5	16.1%	5	16.1%	21	67.7%	31	100.0%	9	4
Total		5	12.2%	6	14.6%	30	73.2%	41	100.0%		-

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Table 9. Association of Various Participant Characteristics with Score on Question About Main Purpose of CPR

There was no significant association of Specialty, Highest Qualification, Years of Experience or presence of ATLS

certification with score on question regarding main purpose of CPR. There was a significant association of score on this question with presence of ACLS/BLS Certification, with all respondents who possessed ACLS/BLS certification answering all options correctly.

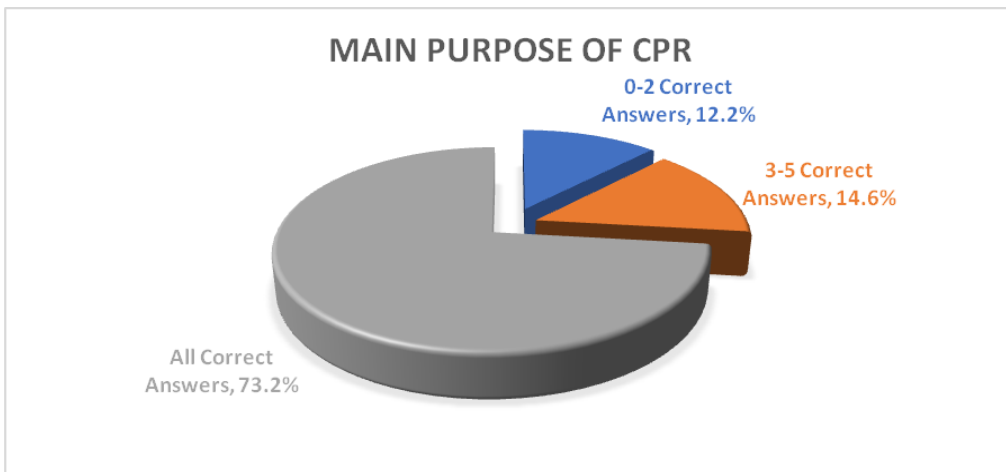


Table 10. Association of Various Participant Characteristics with Response on Question About Correct Order of CPR

Participant Characteristics		Correct Order of CPR				Total		Chi-Square Test	
		CAB		ABC					
		N	%	N	%	N	%	χ^2	p
Specialty	Emergency Medicine	11	91.7%	1	8.3%	12	100.0%	2.477	0.290
	Cardiology	9	100.0%	0	0.0%	9	100.0%		
	Others	20	100.0%	0	0.0%	20	100.0%		
Highest Qualification	Graduate	11	91.7%	1	8.3%	12	100.0%	2.477	0.290
	Post-Graduate	11	100.0%	0	0.0%	11	100.0%		
	Doctoral/Equivalent	18	100.0%	0	0.0%	18	100.0%		
Years of Experience	1-5 Years	11	91.7%	1	8.3%	12	100.0%	2.477	0.290
	6-10 Years	11	100.0%	0	0.0%	11	100.0%		
	>10 Years	18	100.0%	0	0.0%	18	100.0%		
ACLS/BLS Certification	Yes	17	100.0%	0	0.0%	17	100.0%	0.726	0.394
	None	23	95.8%	1	4.2%	24	100.0%		
ATLS Certification	Yes	10	100.0%	0	0.0%	10	100.0%	0.331	0.565
	None	30	96.8%	1	3.2%	31	100.0%		
Total		40	97.6%	1	2.4%	41	100.0%	-	-

There was no significant association of Specialty, Highest Qualification, Years of Experience, presence of ACLS/BLS

certification, or presence of ATLS certification with score on question regarding correct order of CPR

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Table 11. Association of Various Participant Characteristics with Response

Participant Characteristics		Ventilation/Compression Ratio				Total		Chi-Square Test	
		0-2 Correct Answers		All Correct Answers					
		N	%	N	%	N	%	χ^2	p
Specialty	Emergency Medicine	1	8.3%	11	91.7%	12	100.0%	1.761	0.415
	Cardiology	1	11.1%	8	88.9%	9	100.0%		
	Others	5	25.0%	15	75.0%	20	100.0%		
Highest Qualification	Graduate	1	8.3%	11	91.7%	12	100.0%	0.994	0.608
	Post-Graduate	2	18.2%	9	81.8%	11	100.0%		
	Doctoral/Equivalent	4	22.2%	14	77.8%	18	100.0%		
Years of Experience	1-5 Years	4	33.3%	8	66.7%	12	100.0%	3.188	0.203
	6-10 Years	1	9.1%	10	90.9%	11	100.0%		
	>10 Years	2	11.1%	16	88.9%	18	100.0%		
ACLS/BLS Certification	Yes	1	5.9%	16	94.1%	17	100.0%	2.569	0.109
	None	6	25.0%	18	75.0%	24	100.0%		
ATLS Certification	Yes	2	20.0%	8	80.0%	10	100.0%	0.080	0.777
	None	5	16.1%	26	83.9%	31	100.0%		
Total		7	17.1%	34	82.9%	41	100.0%	-	

ON QUESTION ABOUT VENTILATION/COMPRESSION RATIO

There was no significant association of Specialty, Highest Qualification, Years of Experience, presence of ACLS/BLS certification, or presence of ATLS certification with score on question regarding Ventilation/Compression Ratio.

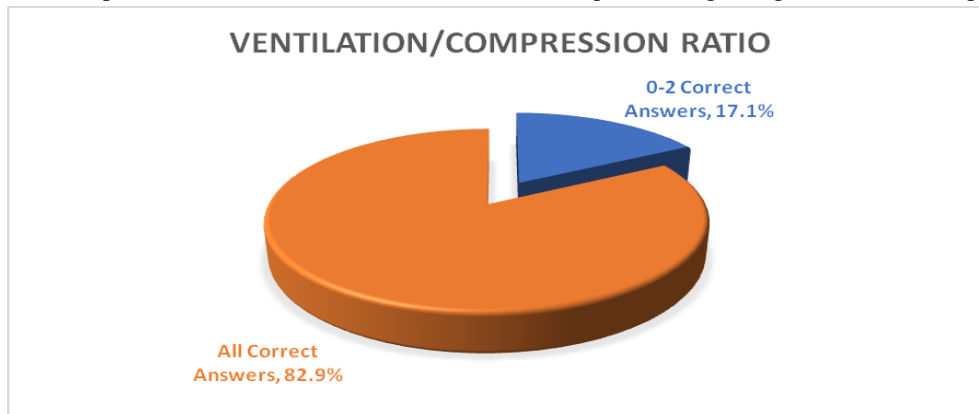


Table 12. Association of Various Participant Characteristics with Score on Question About Recommended Procedure for Chest Compression

Participant Characteristics		Recommended Procedure for Chest Compression						Total		ChiSquare Test	
		0-2 Correct Answers		3-5 Correct Answers		All Correct Answers					
		N	%	N	%	N	%	N	%	χ^2	p
Specialty	Emergency Medicine	2	16.7%	0	0.0%	10	83.3%	12	100.0%	25.68	0.001
	Cardiology	0	0.0%	7	77.8%	2	22.2%	9	100.0%		
	Others	0	0.0%	2	10.0%	18	90.0%	20	100.0%		

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Highest Qualification	Graduate	2	16.7%	0	0.0%	10	83.3%	12	100.0%	13.85	0.008
	Post-Graduate	0	0.0%	1	9.1%	10	90.9%	11	100.0%		
	Doctoral/Equivalent	0	0.0%	8	44.4%	10	55.6%	18	100.0%		
Years of Experience	1-5 Years	2	16.7%	4	33.3%	6	50.0%	12	100.0%	8.136	0.087
	6-10 Years	0	0.0%	3	27.3%	8	72.7%	11	100.0%		
	>10 Years	0	0.0%	2	11.1%	16	88.9%	18	100.0%		
ACLS/BLS Certification	Yes	0	0.0%	2	11.8%	15	88.2%	17	100.0%	3.690	0.158
	None	2	8.3%	7	29.2%	15	62.5%	24	100.0%		
ATLS Certification	Yes	0	0.0%	1	10.0%	9	90.0%	10	100.0%	2.018	0.365
	None	2	6.5%	8	25.8%	21	67.7%	31	100.0%		
	Total	2	4.9%	9	22.0%	30	73.2%	41	100.0%	-	

There was a significant association between the specialty and highest qualification of the respondent and score on question about recommended procedure for chest compression. There

was no association between the scores on this question and other characteristics

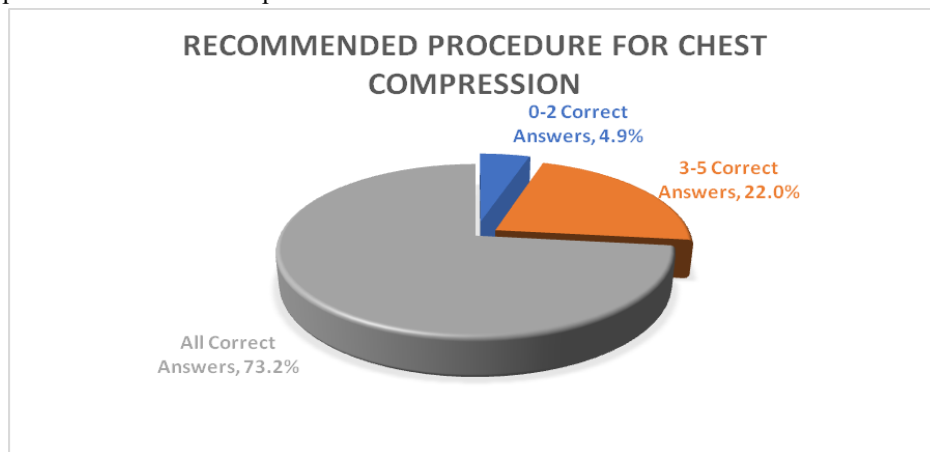


Table 13. Response to the statements regarding the indications, methods and effectiveness of cardiopulmonary resuscitation (Cognitive Assessment)

Q. No.	Question	True		False		Don't Know	
		N	%	N	%	N	%
1	CPR is an emergency procedure which is attempted in an effort to return life in cardiac arrest	4	100.0%	0	0.0%	0	0.0%
2	It has to be attempted always inside of a hospital not outside	6	14.6%	3	85.4%	0	0.0%
3	CPR is generally only effective if performed within 6–7 minutes of the stoppage of blood flow to vital organs	3	80.5%	8	19.5%	0	0.0%
4	Artificial respirations are more appropriate than CPR, if a person is not breathing but has palpable pulse (i.e., respiratory arrest)	3	73.2%	1	26.8%	0	0.0%
5	On average, 85–90% of people who receive CPR survive if conducted by experienced personnel	3	85.4%	6	14.6%	0	0.0%
6	The brain may sustain damage after blood flow has been stopped for about 4 mins and irreversible damage after about 7 mins	3	85.4%	4	9.8%	2	4.9%

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7	According to the recent survey people with no connection to the victim are more likely to perform CPR than a member of their family	24	58.5%	0	0.0%	17	41.5%
8	CPR is generally continued until the person regains return of spontaneous circulation or is declared dead	38	92.7%	2	4.9%	1	2.4%
9	Defibrillator is an electrical device used as shock to the heart and needed to restore a viable or “perfusing” heart rhythm	40	97.6%	1	2.4%	0	0.0%
10	Compression-only CPR by the lay public is recommended to an adult having cardiac arrest out of hospital	40	97.6%	1	2.4%	0	0.0%
11	The survival rate is very high if immediate CPR is done followed by defibrillation within 3–5 minutes of sudden cardiac arrest	37	90.2%	4	9.8%	0	0.0%
12	Compression-only CPR is less effective in children than in adults, as cardiac arrest in children is more likely to have a non-cardiac cause	39	95.1%	2	4.9%	0	0.0%
13	It is always better to be calm and contented while conducting CPR rather than look frightened	33	80.5%	5	12.2%	3	7.3%
14	CPR is often severely misrepresented in movies and television as being highly effective in resuscitating a person who is not breathing and has no circulation	35	85.4%	2	4.9%	4	9.8%

The above table summarizes the response to the statements regarding the indications, methods and effectiveness of cardiopulmonary resuscitation (cognitive assessment).

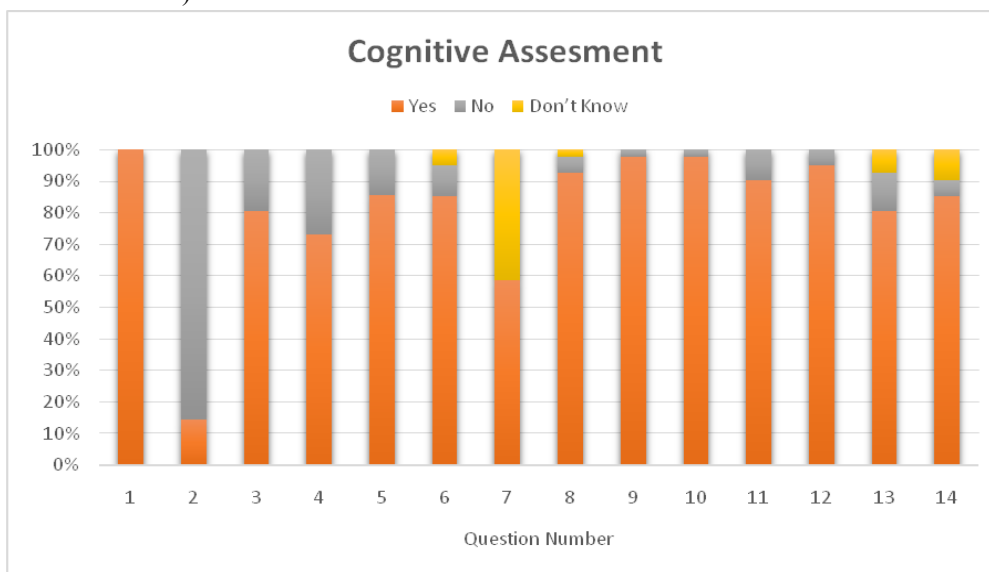


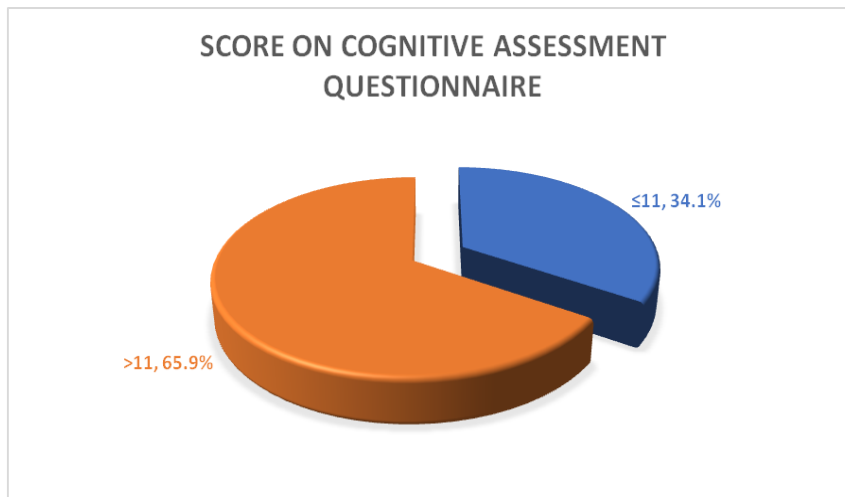
Table 14. Association of Various Participant Characteristics with Score on Cognitive Assessment Questionnaire

Participant Characteristics		Score on Cognitive Assessment Questionnaire				Total		Chi-Square Test	
		≤11		>11					
		N	%	N	%	N	%	χ ²	p
Specialty	Emergency Medicine	5	41.7%	7	58.3%	12	100.0%	0.877	0.645
	Cardiology	2	22.2%	7	77.8%	9	100.0%		
	Others	7	35.0%	13	65.0%	20	100.0%		
	Graduate	7	58.3%	5	41.7%	12	100.0%	9.006	0.011

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Highest Qualification	Post-Graduate	0	0.0%	11	100.0%	11	100.0%		
	Doctoral/Equivalent	7	38.9%	11	61.1%	18	100.0%		
Years of Experience	1-5 Years	4	33.3%	8	66.7%	12	100.0%	0.415	0.813
	6-10 Years	3	27.3%	8	72.7%	11	100.0%		
	>10 Years	7	38.9%	11	61.1%	18	100.0%		
ACLS/BLS Certification	Yes	3	17.6%	14	82.4%	17	100.0%	3.516	0.061
	None	11	45.8%	13	54.2%	24	100.0%		
ATLS Certification	Yes	2	20.0%	8	80.0%	10	100.0%	1.177	0.278
	None	12	38.7%	19	61.3%	31	100.0%		
Total		14	34.1%	27	65.9%	41	100.0%		

There was a significant association of score on cognitive assessment questionnaire and highest qualification, but not with other respondent characteristics.



DISCUSSION

Code blue team is reality in each and every capable hospitals who are giving tertiary level of care, so intra hospital cardiac arrest is evident. Though as per AHA guideline intra and out of the hospital cardiac arrest followed different chain of survival, however CPR is always remain the main stay of treatment. There are numerous study done on CPR knowledge among health care provider in developed country with optimistic result, data are limited for developing country and few of the studies that has been done indicate a dismissal outcome.

Study among south Asian physicians showed that Sixty percent of them reported that they know to operate an automated external defibrillator (AED), and 38% had attended AED training. 36% were willing to perform mouth-to-mouth ventilation during CPR, and 53% preferred chest compression-only resuscitation (CCR) to standard CPR. It was found those aged 50 years were more likely to be trained in basic cardiac life support (BCLS) (P = 0.001) and advanced cardiac life support (P = 0.005) or to have ever attended to a

patient with cardiac arrest (P = 0.007). Female physicians tended to agree that all clinics should have AEDs (P = 0.005) and support legislation to make AEDs compulsory in clinics (P = 0.001). It was found that a large proportion of physicians who were trained in BCLS (P = 0.006) were willing to perform mouth-to-mouth ventilation²³.

Another study done at Karachi (2019) concluded there is a lack of knowledge of CPR among healthcare professionals, particularly regarding the updates made in the 2015 American Heart Association (AHA) guidelines. However, an overall positive attitude was observed. In this study it was concluded majority of the doctors were unaware of the revised rate and depth of chest compressions. (65.6% and 75.8% respectively). While many know the abbreviations of BLS and CPR (96.55% and 95.4%, respectively), 56.5% did not know what automated external defibrillator (AED) stand for. CPR was preferred over chest compression-only resuscitation (CCR) by 91.6%.²⁴

Study done in port moresby hospital (Papua New Guinea) assessed the knowledge of physician regarding CPR concluded that Knowledge of CPR in this study population

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was uneven and overall inadequate. In this study only 59% of respondents knew that basic CPR was a priority over intubation. 83% knew the correct compression: ventilation ratio for children but 44% knew this for adults. 38% knew the correct compression rate for children and 33% for adults²⁵. Another study done by Bhatnagar, et al about: Resuscitation: Knowledge in young doctors showed that The average overall score was 25.58 (± 5.605) marks out of a maximum of 40 marks in pre-test, i.e., 63.97% and improved to 33.88 (± 3.38) marks in post test, i.e., 84.74%. After 6 months in the residual knowledge test, the score declined to 26.96 (± 6.09) marks, i.e., 67.4% and concluded that CPR training program being conducted was adequately efficacious, but a refresher course after 6 months could help taking the knowledge and skills acquired by PG students a long way²⁶.

RESULT

In our study 41 physicians responded out of 80 who have been contacted (response rate 51.25%) out of which 75.6% were male. Age distribution among study population showed that the mean age of the participants was 39.46 (± 9.01) years with a median of 38 years. The age ranged from 25-64 years. About the speciality involved it was found that large portion of study population are consist of physicians from emergency medicine (29.3%), cardiology (interventional) (9.8%) and non interventional cardiology (12.2%). As for qualification it was found that 43.9% holding doctoral level of medical degree and 26.8% are holding masters degree. 29.3% of study population is graduate in medical science. The mean years of experience of the participants was 12.76 (± 8.81) years with a median of 10 years. The years of experience ranged from 1-35 years. Majority of the respondents (58.5%) did not have ACLS/BLS certification and 2.4% has expired certification status. Majority of the respondents (75.6%) did not have ATLS certification. 100% of study population are aware of importance of CPR in clinical practice though 14.6% do not believe that CPR knowledge should be made mandatory. 97.6% recognised that CPR is a basic emergency procedure. 73.2% of population are interested to take part in CPR awareness programme. 7.3% believe CPR is unethical and whereas 2.4% concluded CPR as harmful and waste of time and manpower. 75.6% recommended CPR as a training programme for undergraduate students.

Regarding the response obtained as answer of main purpose of CPR it was correlated with speciality, years of experience, ACLS/BLS certification, ATLS certification. For speciality comparison it was found statistically non significant ($\chi^2 = 6.353$ and $p = 0.253$), however there statistically significant correlation between ACLS/BLS certification and knowledge about main purpose of CPR and effectiveness of it. Ultimately our study concluded that there was no significant association of speciality, highest qualification, years of experience or presence of ATLS certification with score on question regarding main purpose of CPR. There was a significant

association of score on this question with presence of ACLS/BLS Certification, with all respondents who possessed ACLS/BLS certification answering all options correctly.

There was no significant association of speciality, highest qualification, years of experience, presence of ACLS/BLS certification, or presence of ATLS certification with score on question regarding correct order of CPR though 2.4% answered as sequence of ABC as correct option. There was no significant association of speciality, highest qualification, years of experience, presence of ACLS/BLS certification, or presence of ATLS certification with score on question regarding ventilation /compression Ratio and 17.1% were unable to recognise all correct option. There was a significant association between the speciality and highest qualification of the respondent and score on question about recommended procedure for chest compression with p value of 0.001 and 0.006 respectively. However there is no association with other factors like ACLS/BLS/ATLS certification or years of experience. 73.2% of study population responded correctly regarding the procedure of chest compression. There was a significant association of score on cognitive assessment questionnaire and highest qualification with p value of 0.011, but not with other respondent characteristics. Regarding the effectiveness of CPR 100% recognised that CPR is an emergent procedure which is attempted to return life. 85.4% correctly recognised that CPR can be initiated at out of the hospital. 80.5% has given correct answer regarding the time frame of initiation of CPR and its effectiveness. 92.7% of physician agreed that during CPR should be continued until return of spontaneous circulation or declared dead. 97.8% recognised defibrillator as important apparatus in CPR. 95.1% of study population has recognised that compression only CPR would be less effective in children as most of the paediatric cardiac arrest are of non cardiac causes. More than 80% physician preferred to remain calm and contented while conducting CPR rather than look frightened and 85.4% believe CPR is often severely misrepresented in movie and television.

CONCLUSION

The study showed variable level of perception of knowledge and level of preparedness towards cardio pulmonary resuscitation among physicians and there are no single variable or determined factor for above.

being able to answer basic questions correctly and more than 70% are interested to take part in CPR awareness programme. All the participant are able to recognise importance of CPR however there is marked variability in response regarding the purpose of CPR, depth of chest compression, compression ventilation ratio. Most of them have agreed regarding the importance of mandatory CPR education and its inclusion in undergraduate curriculum.

. Though the study indicates there is correlation between the ACLS/BLS/ALS certification and knowledge of CPR further

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study and evaluation is needed in context of developing countries. It is also recommended a refresher course intending towards last years of medical school would be beneficial regarding knowledge of CPR. 80.5% has given correct answer regarding the time frame of initiation of CPR and its effectiveness. 92.7% of physician agreed that during CPR should be continued until return of spontaneous circulation or declared dead. 97.8% recognised defibrillator as import apparatus in CPR. 95.1% of study population has recognised that compression only CPR would be less effective in children as most of the paediatric cardiac arrest are of non cardiac causes.

It is concluded that perception towards CPR is optimal as most of study population are able to answer the basic question correctly, however regarding actual procedure of CPR response are variable.

RECOMMENDATION

It is recommended that a structured training programme about CPR will be beneficial to physicians and undergraduate medical students both for optimal perception of knowledge regarding CPR and its preparedness. Also in context of developing country further research is needed among physicians and health care providers regarding knowledge of CPR with larger population size. A training programme initiated by medical council should be made mandatory for physicians irrespective of speciality. There should be more awareness programme regarding CPR for physicians, medical students and public.

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ETHICAL COMMITTEE APPROVAL

Ethical committee approval was taken from local ethical committee Medica hospital, Kolkata

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