Original Research Article

Knowledge and Attitude towards Adult Cardio Pulmonary Resuscitation (CPR) Among Health Professionals

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Abstract

Introduction: Mortality due to Cardiac arrest account for 15–20% of all Mortality. Data from previous studies suggest that more than 3 million sudden cardiac deaths occur worldwide every year and survival is lower than 8%. In India sudden deaths due to cardiac arrest contribute to 10% of mortality and less than 2% in India receive Cardio pulmonary resuscitation (CPR). **Aims:** To estimate knowledge and attitude of cardio pulmonary resuscitation and factors associated. **Methodology: Study Design** – Cross sectional study in Private Medical college. Study population-786 health professionals. Sample size: 498 Sampling method- Stratified random sampling. Study period- January 2021- June 2021.Study area/setting- Private Medical college present in Mulugu Mandal, Sidhipet district Ethical Clearance- Obtained from the Institutional Ethical committee of the RVMIMS & RC. Data Collection Tool- Pretested Prevalidated semi-structured questionnaire was developed which was divided into four sections. Data Analysis-Percentages, Proportions and Chi-Square test used Using Microsoft Excel Version 2019 software. **Observations and results**-146 (29.32%) of health professionals had good knowledge and 454 (91.16%) have positive attitude. **Conclusion**-Significantly better knowledge was found among more than 30 years age group, Male gender, among doctors, among MD/MS educated but no difference found with regards to attitude and significantly better knowledge and Attitude seen in persons with more years of work experience, experience of resuscitation and who have undergone CPR training.

Key words: knowledge; attitude; health care professionals; cardio pulmonary resuscitation.

Introduction

Deaths due to Cardiac arrest account for 15–20% of all deaths[1]. More than 3 million sudden cardiac deaths occur worldwide every year and survival is lower than 8%[1]. The mortality due to sudden cardiac arrest in India is approximately 4280/100,000 [2] and less than 2% of cardiac arrest patients in India receive Cardio pulmonary resuscitation (CPR)[3].

Various studies from India, Switzerland, Pakistan, United Kingdom, Poland also confirmed that knowledge among health care professionals is inadequate[1,4,5].

Hence, effort was made in the present study to know the knowledge and attitude of health professionals regarding CPR and associated factors.

Methodology

Study design

Cross sectional study

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Study Period

Conducted between January to June 2021 which included Preparation of data collection tool and review of literature (January), data collection (February and March), Data entry and Analysis (April) and preparation of final manuscript (May and June).

Study setting

The study was conducted in a Private Medical college attached to a Tertiary care Hospital having 880 beds and currently catering about 26 lakh population with 1265 villages surrounding.

Study Population

There were 786 health professionals working in the hospital, among whom there were 321 Nursing staff, 141 House surgeons, 192 Duty Doctors, 132 Non clinical (21)/Para clinical (41)/clinical teaching (70) Doctors.

Inclusion criteria

Health professionals working in the institute for one or more than one year and who gave consent to participate in the study and out of 786, 638 participants were working for more than one year and in those 622 participants gave consent to participate in the study.

Sample size[6]

was calculated using formula for qualitative cross sectional studies where Z α is the standard normal deviate, which is equal to 1.96 at 95% confidence interval and Prevalence was taken 25.1% as proportion of good knowledge about CPR [5] and absolute precision taken as 10% of Prevalence (25.1%)[5] using the formulae [6]

Sample size(n) = $\frac{\frac{z^2 X\, p(1-p)}{e^2}}{1+\frac{z^2 X\, p(1-p)}{e^2 N}}$ .On calculation , sample size was 463 and Considering 10% non-response rate, 510 health professionals were included.

Sampling method

Stratified random sampling method was followed, health professionals were divided into 6 categories based on their level/type and Field of occupation (Nursing staff, House surgeons, Duty Doctors, non-clinical Doctors, Paraclinical Doctors and clinical Doctors) and from each category/strata the proportion of required sample was selected by simple random sampling and hence out of 622 participants,510 health professionals were included in the study.

Data Collection tool

Pretested Prevalidated semi-structured questionnaire which was divided into four sections. Most of the questions were open ended.1st section included Demographic characteristics like age, sex, religion, occupation and education of the population.2nd section included work related characteristics like work experience, specific area/department working, experience about cardiac arrest case exposure and their resuscitation, about Cardio pulmonary resuscitation training and practical experiences. 3rd section included 27 questions regarding knowledge about various steps, procedures and guidelines on cardio pulmonary resuscitation and the 4th section includes 12 questions regarding attitude on performing cardio pulmonary resuscitation.

The questionnaire was derived from a standard reference 2020 American Heart Association (AHA) guidelines for CPR[7], Garg et al study [8] and Singh et al study [9].

Reliability and validity

Questionnaire was validated and also checked for its clarity, readability, acceptability and repeatability by 12 volunteer health professionals, two from each stratum (Nursing staff, House surgeons, Duty Doctors, non-clinical Doctors, Paraclinical Doctors and clinical Doctors) and questionnaire was modified based on their suggestions. Reliability of the tool was checked using Cronbach's alpha reliability coefficient and was found to be 0.78 for knowledge and 0.88 for attitude questions. Out of 510 health professionals, these 12 were excluded from the study and hence 498 responses were included in the study.

Scoring of knowledge was done giving score one for answered question and score zero for unanswered. Health professionals who could answer 80% (22 questions) of the questions were considered having very good knowledge, 50%-80 % (14-22questions) as good knowledge,30-50% (8-14 questions) as average knowledge and less than 30%(<8questions) as poor knowledge. In a similar way scoring of Attitude was done out of twelve questions if Health professionals could answer 80% (9 questions) of questions positively they were considered highly positive attitude, if could answer 50% (6-9 questions) then positive attitude and if less than 50% (<6 questions) answered positively then considered poor attitude.

Ethical clearance

Obtained from the Institutional Ethical committee.

Informed consent

Taken before starting data collection by approaching all the health professionals in their departments or units and after explaining about the objectives, purpose, and importance of the study with the help of same 12 volunteers (two from each stratum) written consent was taken. All the health professionals were ensured about the confidentiality of their identity and their responses. They were also assured that the results will be used only for research purposes.

Data collection

Data was collected with the help of same 12 health professionals, that is two from each category who have validated the questionnaire and they have taken the responsibility of distribution, guidance, collection and submission of filled questionnaire.

Data Analysis

Data from the filled forms was entered and analysed using Microsoft Excel Version 2019 software. The sum of correct responses for the 27 knowledge questions was computed and expressed in percentage to categorise as very good, good, average or poor knowledge and similarly attitude was also computed and were divided as highly positive attitude, positive attitude and poor attitude. Chi square was calculated to know the factors of significant association and $P<0.05$ was considered significant.

Observations and Tables

In the present study out of 786 health professionals working in Private medical college and tertiary care hospital only 498 were included among them the proportional number of Nursing staff, House surgeons, Duty Doctors, non-clinical, Para clinical, clinical teaching staff were included.

Table 1 Socio demographic and work-related characteristics of health professionals

S.No	Characteristic	Number	Percentage
1	**Age**		
	20-29	312	62.65
	30-39	123	24.7
	≥40	63	12.65
2	**Sex**		
	Male	222	44.58
	Female	276	55.42
3	**Religion**		
	Hindu	348	69.88
	Muslim	124	24.9
	Christian	26	5.22
4	**Occupation**		
	Anaesthetist	7	1.41
	Clinical specialist Doctors	37	7.43
	Non/Para clinical specialist Doctors	39	7.83
	Duty medical officer (MBBS)	122	24.5
	House surgeons	89	17.87
	Nursing staff	204	40.96
5	**Education**		
	MD/MS	83	16.67

	MBBS	211	42.37
	BSC/GNM NURSING	204	40.96
	Total	498	100
S. No	**Work related characteristics**	**Number**	**Percentages**
1	**Work experience**		
	< 2 years	183	36.75
	2-5 years	208	41.77
	>5 years	107	21.49
2	**Specific work area**		
	Rotation of work area/House surgeons	187	37.55
	Experience in Causality and ICU	197	39.56
	Intensive care unit (ICU) /wards	16	3.21
	Operation room/wards	15	3.01
	Outpatient department	6	1.2
	Laboratory	21	4.22
	Others/Non clinical/paraclinical staff	18	3.61
4	**Did you ever Encounter cardiac arrest case?**		
	Yes	153	30.72
	No	345	69.28
5	**Did you any time resuscitate cardiac arrest Victim in presence of expert?**		
	Yes	123	24.70
	No	375	75.3
6	**Did you any time resuscitate cardiac arrest Victim independently?**		
	Yes	30	6.02
	No	468	93.8
7	**Have you under gone CPR Training**		
	Yes	144	28.92
	No	354	71.08
8	**When did you take CPR Training**		
	<2 years	88	17.67
	>2 years	410	82.33
9	**Source of Information about CPR?**		
	Reading	331	66.47
	College course/syllabus	89	17.87
	Course Training	44	8.84
	Seminar presentation	34	6.83

Table 1 describes socio demographic characteristics of health professional. Majority of the health professionals were between 20-29 years (62.65%). Males (44.58%) and females (55.42%) were almost equally distributed. Most of the staff were nursing staff (40.96%) followed by duty medical officer (24.5%), 8.84% of doctors belong to clinical specialty. Regarding education 16.67% were MD/MS, 42.37% were MBBS and 40.96% were BSC/GNM Nursing. Regarding work related characteristics and practice of cardio pulmonary resuscitation. Majority (61.85%) have 2-5 years of work experience in present hospital. Majority of the health professionals were having Rotation of work area (37.55). Experience in causality and ICU was seen in 39.56% of health professionals. Cardiac arrest case was seen by 30.72% health professionals during their work period. Experience of resuscitating cardiac arrest case in presence of expert was experienced by 24.7% and 6.02% had experience of resuscitation independently. Among health professionals 28.92% have undergone CPR training. Majority that is 66.47% have gained knowledge regarding CPR by reading books and 17.87% have gained knowledge as it is present in syllabus.

Table 2 Knowledge of Health professionals on Cardio pulmonary resuscitation

S.NO	Questions	Number	Percentages
1.	What are the Causes of Reversable cardiac arrest?	172	34.54
2	How do you first recognize cardiac arrest person?	232	46.59
3	Full form of BLS and ALS	187	37.55
4.	When you find someone unresponsive in the middle of the road, what should your first response be?	163	32.73
5	How do you check patient responsiveness at the start of CPR?	232	46.59
6.	If you confirm somebody is not responding to you even after shaking and shouting at him, what should your immediate action be?	162	32.53
7	Correct Sequence of steps of Adult chain of survival	43	8.63
8	The correct sequence of the BLS steps, according to the 2020 AHA guidelines	43	8.63
9	Where do you check pulse for unresponsive adult	224	44.98
10	Time to check pulse for unresponsive adult	44	8.84
11	Components of High-Quality CPR	40	8.03
12	Recommended Chest compression depth during CPR?	187	37.55
13.	The location of hands during chest compression	356	71.49
14.	Recommended rate of effective chest compression	97	19.48
15.	compression to ventilation ratio according to adult BLS AHA 2020 guidelines	44	8.84
16	If you do not want to give mouth-to-mouth CPR, what will be the appropriate course of	23	4.62

	action?		
17.	What are the Indications to stop CPR?	67	13.45
18.	The rescuers switch roles when performing two-rescuer CPR	23	4.62
19.	The manoeuvre used to open airway	45	9.04
20.	Indications of Defibrillator	176	35.34
21.	Condition where Defibrillator is not indicated	176	35.34
22	What does the abbreviation AED stand for	44	8.84
23.	The defibrillator pads placement on an adult victim	289	58.03
24.	Recommendations during the use of defibrillator	23	4.62
25.	Drug and dose during shockable & Non shockable cardiac arrest	188	37.75
26.	A type of equipment used to monitor the ventilation rate, quality of CPR and return of spontaneous circulation	44	8.84
27	After return of spontaneous circulation from CPR, the post resuscitation care	88	17.67

As shown in Table 2, there were 27 knowledge questions regarding various components and guidelines of cardio pulmonary resuscitation. The median knowledge score of the study participants was 8.5questions (range-4-24 questions).

Table 3: Attitude of Health professionals on Cardio pulmonary resuscitation

S.NO	Attitude questions	Number	Percentage
1.	Do you think that acquiring CPR skill is necessary?	498	100
2	If you knew CPR well, will you be willing to perform CPR	267	53.61
3.	Will you be Willing to provide mouth-to-mouth ventilation, if required	168	33.73
4.	What would prevent you from performing CPR on those who need it?		
A	I could contract a disease	123	24.7
B	Poor hygiene of person needing CPR	143	28.71
C	There could be legal consequences/ Fear and anxiety/ Dangerous or unfavourable environment	89	17.87
D	Religious and socio-cultural factors	29	5.82
E	Nothing prevents	231	46.39
5	Do you think CPR training should be incorporated into the undergraduate curriculum?	287	57.63
6	Do you feel that all professionals should get BLS/ACLS training during their work period	302	60.64
7	Do you feel that Health professionals should be recertified on CPR course every 2years?	127	25.5
8.	Do you feel that Establishing CPR team may have good outcome for cardiac arrest victims?	342	68.67
9.	Do you feel that there should be Immediate access to defibrillator and resuscitation drugs in all hospital areas	221	44.38
10	Do you feel that Knowledge and attitude of health professionals towards CPR can affect patient outcome	387	77.71
11	Are you Confident in recognising a victim who needs CPR?	44	8.84
12	Are you confident in performing CPR if required?	44	8.84

As shown in table 3, there were 12 questions to assess the Attitude and the median score of health professionals was 7.5 questions (range 5-12 questions).

Table 4: Association of Socio Demographic characteristics with Knowledge and Attitude of Health Professionals

Socio demographic characteristics	Total	Very Good Knowledge (>22)	Good Knowledge (14-22)	Average Knowledge (8-14)	Poor Knowledge (<8)	Chi square P value
Age						
20-29	**312**	24(7.69)	63(20.19)	66(21.15)	159(50.96)	30.13
30-39	**123**	14(11.38)	35(28.46)	40(32.52)	34(27.64)	P<0.05
≥40	**63**	6(9.52)	4(6.35)	14(22.22)	39(61.9)	
Sex						
Male	**222**	26(11.71)	64(28.83)	58(26.13)	74(33.33)	33.16
Female	**276**	18(6.52)	38(13.77)	62(22.46)	158(57.25)	P<0.05
Occupation						
Clinical specialist Doctors	**44**	26(59.09)	16(36.36)	1(2.27)	1(2.27)	
Non/Para clinical specialist Doctors	**39**	3(7.69)	18(46.15)	7(17.95)	11(28.21)	245.27
Duty medical officer (MBBS)/ House surgeons	**211**	6(2.84)	54(25.59)	72(34.12)	79(37.44)	P<0.05
Nursing staff	**204**	9(4.41)	14(6.86)	40(19.61)	141(69.12)	
Education						
MD/MS	**83**	29(34.94)	34(40.96)	8(9.64)	12(14.46)	177.39
MBBS	**211**	6(2.84)	54(25.59)	72(34.12)	79(37.44)	P<0.05
BSC/GNM NURSING	**204**	9(4.41)	14(6.86)	40(19.61)	141(69.12)	
Work experience						
< 2 years	**183(36.75)**	6(3.28)	19(10.38)	14(7.65)	144(78.69)	120.99

>2 years	**315(63.25)**	38(12.06)	83(26.35)	106(33.65)	88(27.94)	P<0.05
Nature of work						
Experience in Causality and ICU	**213(42.77)**	41(19.25)	78(36.62)	83(38.97)	11(5.16)	264.2397 P<0.05
No experience in Causality and ICU	**285(57.23)**	3(1.05)	24(8.42)	37(12.98)	221(77.54)	
CPR Training						
Yes	**144(28.92)**	44(8.84)	83(16.67)	11(2.21)	6(1.2)	341.8 P<0.05
No	**354(71.08)**	0	19(3.82)	109(21.89)	226(45.38)	
Experience of cardiac arrest case and resuscitation.						
Yes	**153(30.72)**	42(27.45)	88(57.52)	12(7.84)	11(7.19)	332.30 P<0.05
NO	**345(69.28)**	2(0.6)	14(4.06)	108(31.3)	221(64.06)	
Total	**498**	44(8.84)	102(20.48)	120(24.1)	232(46.59)	

Association of Socio Demographic characteristics with Attitude of Health Professionals

Socio demographic characteristics	**Total**	**Highly positive Attitude (>9)**	**Positive Attitude (6-9)**	**Poor Attitude (<6)**	**Chi square P value**
Age					
20-29	312	87(27.88)	211(67.63)	14(4.49)	69.89 P<0.05
30-39	123	28(22.76)	88(71.54)	7(5.69)	
≥40	63	12(19.05)	28(44.44)	23(36.51)	
Sex					
Male	222	66(29.73)	141(63.51)	15(6.76)	2.14 P>0.05
Female	276	61(22.1)	186(67.39)	29(10.51)	
Occupation					
Clinical specialist Doctors	44	23(52.27)	15(34.09)	6(13.64)	6.84 P>0.05
Non/Para clinical specialist Doctors	39	19(48.72)	13(33.33)	7(17.95)	
Duty medical officer (MBBS)/ House surgeons	211	67(31.75)	126(59.72)	18(8.53)	
Nursing staff	204	18(8.82)	173(84.8)	13(6.37)	
Education					
MD/MS	83	42(50.6)	29(34.94)	12(14.46)	4.89 P>0.05
MBBS	211	67(31.75)	126(59.72)	18(8.53)	
BSC/GNM NURSING	204	18(8.82)	173(84.8)	13(6.37)	
Work experience					
< 2 years	183(36.75)	28(15.3)	134(73.2)	21(11.5)	16.608 P<0.05
>2 years	315(63.25)	99(31.43)	193(61.27)	23(7.3)	
Nature of work					
Experience in Causality and ICU	213(42.77)	77(36.15)	118(55.4)	18(8.45)	22.58 P<0.05
No experience in Causality and ICU	285(57.23)	50(17.54)	209(73.33)	26(9.12)	
CPR Training					
Yes	144(28.92)	67(46.53)	54(37.5)	23(15.97)	71.26 P<0.05
No	354(71.08)	60(16.95)	273(77.12)	21(5.93)	
Experience of cardiac arrest case and resuscitation.					
Yes	153(30.72)	63(41.18)	87(56.87)	3(1.96)	35.7 P<0.05
NO	345(69.28)	64(18.55)	240(69.57)	41(11.88)	
Total	498	127(25.5)	327(65.66)	44(8.84)	

As shown in table 4, 44(8.84%),102(20.48%),120(24.1%) &232(46.59%) of health professionals had very good knowledge, good knowledge, average knowledge and poor knowledge respectively. On finding Association of certain Socio demographic characteristics with knowledge of CPR. Knowledge of CPR was found to be significantly higher (statistically significant with P value<0.05) among more than 30 years group, Male gender, among doctors especially clinical doctors, among health professionals who were educated till MD or MS, having >2 years work experience, who have experience in ICU/Casualty, who have undergone CPR training and who had experience of resuscitation compared to other health professionals. Regarding Attitude, 127(25.5%),327(65.66%) and 44(8.84%) of health professionals have highly positive attitude, positive attitude and poor attitude respectively.

With respect to attitude regarding CPR, it was found that significantly greater number of health professionals belonging to 20-29 & 30-39 years were having positive attitude compared to more than 40 years age group. There was no significant difference found in Attitude among Gender, among different occupational groups and also with educational qualification but significantly positive attitude was seen among health professionals with more than 2 years' work experience,

having casualty/ICU experience, those who have undergone CPR Training and who had experience of resuscitating cardiac arrest case.

Discussion

In the current study, knowledge and attitude regarding cardio pulmonary resuscitation among 498 health professionals working in a private medical college and tertiary hospital was assessed.

It was found that, 29.32% (>50% answered) of health professionals had good knowledge and 24.1% (30-50%) had average & 46.59% had poor knowledge regarding CPR and our finding were similar to Mersha AT et al [5] study (25.1%), Mendhe et al study (22%) [1], Mohammed et al study (18.5%)[10] but lower than the study done in Italy (62.3%)[11], Kuwait (36%)[12]. Less knowledge in the present study might be due to difficult questions or may be due to inclusion of different level of health professionals or due to many participants with less than 2 years (36.75%) work experience or may also be due to lack of CPR training. However, knowledge in the present study, was higher than the study done in Ethiopia (6.7%) [13].

CPR training was undergone by 28.92% of the health professionals which was quiet less compared to Mersha et al study (38.9%) [5] and Spinelli et al (50%) [11], Kaihula et al (67%)[14] but better than Pepera G et al study (21.4%)[15].

In the present study, out of 27 questions, the median knowledge score of the study participants was 8.5 questions, lesser than Mersha AT et al study [5] (14.5) but better than Mendhe HG et al study (6)[1].

Experience of resuscitation of cardiac arrest person was experienced by 30.72% of health professionals similar to Mendhe HG et al study (29%) [1] but more number in Mersha AT et al study [5] (65.9%) and Majid et al et al study (74.1%)[16] and very less number in Pepera G et al study (0.9%)[15].

In the present study, knowledge of CPR was found to be significantly higher among health professionals of more than 30 years group, Male gender, among doctors and who were educated till MD or MS similar to B.A. Adewale et al study [17] but in Mersha AT et al [5]study significant difference was not found with age, sex and educational status and Mendhe et al study[1] significant difference was not found between doctors and nurses. In Kaihula et al [14]study significant better knowledge was found among doctors of emergency department compared to other department doctors similar to the current study. In Majid et al study no significant association was found with age and designation[16].

In the present study there was strong association of knowledge of participants with work experience and nature of work that is casualty and ICU experience similar to Mersha AT et al [5] study. Strong association might be due to more exposure of cases requiring CPR and hence increasing their inquisitiveness to search, read and understand various steps and procedures in CPR as it was also found from the present study that Knowledge was significantly more among health professionals who had experience of attending and resuscitating cardiac arrest cases and this finding was supported by findings of Mersha AT et al study [5], Kaihula et al [14].

However, in a study done in Kuwait [12], knowledge decreased with increase in work experience, this may be due to lack of regular CPR training or lack of regular discussion about the topic [5].

In the present study, 28.92% have undergone CPR training and their knowledge was significantly better than their counterparts similar to Mersha et al study [5], Mohammed et al study [10], Weji BG et al study [13] and Pepera G et al study [15] indicating that regular conduction of CPR Training programmes and making them compulsory to attend through guidelines from Medical Council of India/National Medical Council will improve the knowledge and attitude on CPR. Studies also suggest that CPR training will improve the clinical outcome and return of spontaneous circulation and hence survival [4,19].

In the present study 91.16% of the health professionals had positive attitude and only 8.84% had poor attitude which was similar to Mohammed et al study (93%) [10] whereas lower attitude was seen in studies conducted in Ethiopia (60.8%) [5]. Knowledge levels (29.32%) of health professionals were quiet low compared to their attitude indicating their willingness to undergo CPR training and also, they can facilitate in the development of future training sessions. Better attitude in the present study could be explained due to influence of social media and news agencies showing the importance of CPR.

Significant better attitude was found among health professionals who have taken CPR training which was similar to study conducted at Ethiopia [5] this difference might be due to sharing of experiences of faculty during training regarding positive recovery of cardiac arrest patients.

There were some limitations of the study and they are it was a cross-sectional study design hence causal inferences may not be established. Study was conducted on health professionals and hence results cannot be generalized to entire population and as most of the sudden deaths due to cardiac arrest occur outside hospital, hence more such studies on other professionals are recommended. The questionnaire elicits only theoretical knowledge regarding CPR, but the topic requires assessment of practical skills on performance of CPR on simulation model and hence further studies on practical assessment required.

Conclusions

Out of 498 health professionals, only 146 (29.32%) had good knowledge and 454 (91.16%) have positive attitude. Significant better attitude in the present study indicates willingness of health professionals to learn CPR and can facilitate in conducting CPR training programmes. Knowledge of CPR was found to be significantly higher among more than 30 years age group, Male gender, among doctors, among MD/MS educated but no significant difference was found with Attitude. Both Knowledge and Attitude was found significantly higher amore more years of work experience, experience of resuscitation and who have undergone CPR training.

Key Message: Results will help to plan skill-based training programmes and simulations sessions on CPR

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