Experimental Research

Cardiopulmonary resuscitation: Knowledge and Attitude of doctors from Lahore

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ABSTRACT

Objective: The objective of study was to assess the knowledge and attitude of doctors from Lahore regarding CPR as per American Heart Association (AHA) guidelines.

Methods: The researchers visited various hospitals and filled e-questionnaires by interviewing respondents.The study was conducted at Jinnah Hospital Lahore, Mayo Hospital Lahore, Punjab Institute of Cardiology Lahore, Sir Ganga Ram Hospital Lahore, Services Hospital Lahore and Mid City Hospital. Data were analyzed using statistical package for social sciences (SPSS) 23 version. Knowledge was assessed based on the scores, with those scoring 10 or more being considered to have good knowledge while those having score less than 10 were considered to have poor knowledge. P values < 0.05 were considered statistically significant.

Results: Out of 792 participants, 68 refused to take part in the study. The total respondents were 724 with the response rate of 91%. The knowledge regarding cardiopulmonary resuscitation of 601(83%) respondents was poor with only 123(17%) doctors having good knowledge. The doctors who received formal CPR training had better knowledge (20.17%) than the doctors who didn't get any training regarding CPR (4.69%). Anesthesiologists scored better among all specialties. The overall attitude of the doctors towards CPR was positive with 93.8% of the respondents willing to do CPR.

Conclusion: The overall knowledge of the doctors regarding CPR is not satisfactory. A practical and functional approach is needed to improve this situation. However, the attitude of the doctors towards CPR is positive.

1. Introduction

Cardiopulmonary Resuscitation – is an emergency lifesaving procedure which is performed when the heart stops beating. Cardiopulmonary resuscitation (CPR) is described by American Heart Association (AHA) as a part of the "chain of survival". It has been recognized that the chances of survival of patients with cardiac arrest is doubled or tripled by the reception of timely and correct cardio-pulmonary resuscitation [1]. American Heart Association (AHA) regularly issues guidelines regarding resuscitation during cardiac arrest. In addition it offers certified courses (Basic Life Support and Advanced Cardiac Life Support) so that individuals may learn the proper way to perform CPR [2].

Sudden Cardiac Arrest Association (SCAA) with American Heart Association (AHA), defines cardiac arrest as: "the suspension of mechanical activity of heart, leading to absence of pulse, unconsciousness, and temporary suspension of breathing" [3] Cardiac arrest is one of the leading causes of death in the world. First line treatment for saving lives following cardiac arrest is cardiopulmonary resuscitation (CPR). To perform high-quality CPR, timely recognition of arrest and initiation of chest compressions along with the correct depth and rate of compressions as well as allowing adequate chest recoil is essential. Inadequacy in any step of CPR due to lack of knowledge or skill is associated with poor return of spontaneous circulation and decreased survival rate [2]. Proper resuscitation with defibrillation as early as possible and proper post–cardiac arrest care are necessary to improve survival rate and neurologic outcomes for patients with the cardiac arrest [4].

Diseases of cardiovascular system (CVS) are the leading cause of deaths by non-communicable diseases, causing up to 80% of deaths worldwide [5]. The estimated annual incidence in the United States for out-of-hospital cardiac arrest (OHCA) treated by emergency medical services (EMS) is 184,383 [6]. In Europe, 350,000 people lose their lives each year because of out-of-hospital sudden cardiac arrest (OHCA) [7]. There has been a steady increase in these numbers over the years.

Adequate awareness, knowledge and skills of basic life support and cardiopulmonary resuscitation are necessary to ensure that life saving measures can be adequately delivered in case of emergency. Sound knowledge is expected from healthcare professionals since their working environment makes it very likely that they will come face to face with such a situation. Basic Life Support training course has been recommended for health care professionals since 1966 especially those who are involved in the code teams [8].

It has been reported that despite its importance many doctors are not able to perform CPR effectively [9]. Studies have been done globally to assess the knowledge and the attitude of the medical professionals but the results are not satisfactory. Studies from Turkey, Greece, Nigeria, Saudi Arabia, India and Nepal point to a lack of proper awareness and knowledge regarding CPR among health care professionals [8–20].

The deaths due to coronary heart diseases (CHD) in Pakistan have reached about 200,000 per year that is 410/100,000 of the population [21]. In Pakistan, although there is not enough data available but some researches which have been conducted in Islamabad, Karachi and Rawalpindi show lack of knowledge and awareness among doctors regarding CPR [9,15,22,23] Although no such study has been done in Lahore.

Moreover, attitude of the person present at the time of CPR is important. Attitude is affected by the perceptions and the beliefs according to the culture and the customs. Attitude towards CPR differs in aspects of age of the patient, nature and stage of disease. It has found that percentage of people reluctant to do CPR on women is more than the people reluctant to do CPR on the men [15]. Similarly, attitude of the person towards self regarding CPR can be different than the attitude towards others regarding CPR. All these factors influence the outcomes of cardiopulmonary resuscitation.

In this study we assessed the knowledge and attitude about cardiopulmonary resuscitation among the doctors of Lahore. To the best of our knowledge it is the first study in Lahore to evaluate the knowledge and attitude of the doctors.

1.1. Objectives

The objective of our study was to assess the knowledge of respondents regarding the Cardio-pulmonary resuscitation as per American Heart Association guidelines as well as to assess their attitude towards it.

1.1.1. Methodology

It was a cross-sectional study. After Ethical approval from Institutional review board and permission from respective administrations of the various hospitals, the team of researchers visited the hospitals and with the help of electronic devices proceeded to get the proformas filled from various respondents. Informed consent from all respondents was taken.

1.1.2. Study design

Cross-sectional study.

1.1.3. Study Setting

Study was conducted in the five main government teaching hospitals and one private hospital of Lahore. The study was conducted at Jinnah Hospital Lahore, Mayo Hospital Lahore, Punjab Institute of Cardiology Lahore, Sir Ganga Ram Hospital Lahore, Services Hospital Lahore and Mid City Hospital. Permission was requested from the three other main private hospitals of Lahore but was not granted.

1.1.4. Study duration

Study duration was March 2019 to March 2020.

1.1.5. Sample size

Sample size was estimated by using WHO Sample size software. By using the formula of estimating population proportion with specified relative precision at confidence level of 95% with anticipated population proportion of 50% and relative error of 5%, sample size was 792. Total respondents were 724 after 68 refusals (response rate was 91%)

1.1.6. Sampling technique

Cluster sampling technique.

1.1.7. Inclusion and exclusion criteria

The doctors present on morning duty in the respective hospitals were included. Any doctor found busy or involved with patients during data collection was excluded from the study for the convenience of all.

1.1.8. Data collection procedure

A team comprising of three medical students collected data through online questionnaires made on Google Forms by using tablets and mobiles. Hard copies of the questionnaires were also available and were provided on the demand. Both the online and hard copy versions were similar. The questionnaires were made in English.

1.1.9. Data collection tool/questionnaire

A structured questionnaire consisting of 41 questions was used. It was available in two forms; online questionnaire and the hard form. Most of the respondents preferred to use the online questionnaire with the help of tablets and mobiles as according to them it was more convenient and easier method. The questionnaire was designed according to the current AHA guidelines. The questionnaire was divided into three sections; demographics, knowledge and attitude. For the knowledge component, total score of all the answers was done. Each correct answer was given a point. There were equal points for all questions. Knowledge was assessed based on the scores (good knowledge = score ≥ 10 and poor knowledge = score < 10).

1.1.10. Data analysis

Data were analyzed using statistical package for social sciences (SPSS) 23 version. Simple frequencies and proportions were calculated. Chi square test was used for the comparison of different variables. ANOVA test was used to compute the mean values for the comparison of specialities and designations. Fischer exact test was used to find the two tailed p value for the score and the number of doctors who received the formal CPR training. Knowledge was assessed based on the scores (good knowledge = score ≥ 10 and poor knowledge = score < 10). P values < 0.05 were considered statistically significant.

1.1.11. Ethical Considerations

The study was conducted after getting permission from the respective hospitals according to their ethical rules and regulations. Informed consent from all the responders was also sought and the participation was voluntary. Anonymity of participants was maintained.

2. Results

Out of 792 participants, 68 refused to take part in the study. The total respondents were 724 with the response rate of 91%. Out of these respondents, 443(61%) were males and 281(38%) were females. 526 (72.5%) were less than 30 years old and 198(27.4%) were greater than 30 years old. 79.42% (575) of the participants had undergone formal training of cardio-pulmonary resuscitation while 20.58% (149) had not. 8.27%(60) of the participants were of post-graduate level while 91.72%

(684) were either doing it or yet to start.

The knowledge of 601(83%) respondents was poor and only 123 (17%) doctors had good knowledge (Table 1). The score of ≥10 out of 15 (67%) was considered as good knowledge and the score <10 as poor knowledge. Only three respondents received the full score of 100%. In total 49.7% of population had score below 46%. The doctors who received formal CPR training had better knowledge (20.17%) than the doctors who didn't get any training regarding CPR (4.69%). Surprisingly, anaesthesiologists had better knowledge (31.25%) than the other specialists even the cardiologists (16.27%) (Table 2). The summarized comparison of the individual questions with is given in table (Table 3).

The overall attitude of the doctors towards CPR is positive. 93.8% of the respondents showed willingness to do CPR and the same percentage of doctors permitted to give CPR on their relatives. However, 87.3% of the respondents allowed self CPR. This shows the change in attitude towards self and the others. The summarized comparison of the individual questions with different characteristics of the respondents along with p values is shown in table (Table 4).

3. Discussion

CPR is the first step and the last hope for the survival of the pulseless and the breathless person. Timely, effective and high quality CPR can be lifesaving. Each step of CPR should be done properly to improve the outcome of this emergency procedure. Given the nature of their profession, healthcare professionals often need to respond and deliver CPR. However there appear to be problems with the retention of knowledge and skills. Almost all the studies that have been done all over the globe to assess the knowledge of the medical professionals show the inadequate knowledge of the medical professionals regarding CPR [8–20]. In this study, the results are approximately the same indicating 83% doctors with the poor knowledge.

When we stratified the results for variables we found that speciality, designation and previous formal training played significant role in the knowledge of the participants.

We found that anaesthesiologist were significantly more likely to be aware of the proper steps of CPR as compared to other fields (p < 0.0001). The anaesthesiologists had the highest score (mean score >8). While the gynaecologists and cardiologists had mean score of 7and 6.5 respectively. However, the doctors in medicine and surgery had the same mean score (6.9). Similar results were also observed by other researchers [24].

The doctors who received formal CPR training had better scores than doctors without formal training. Studies that had been done in Karachi [9] India [14] Nepal [15]and others [16,27] also showed the better scores for the trained doctors than the untrained ones. This indicates the importance of BLS courses and workshops in improving the outcomes of CPR. It has been demonstrated that there is a decay of skills which starts 6 months after the course [25] while significant improvement has been shown with refresher course [26].

It has been seen that previous experience of doing CPR has a positive effect on the median score as compared to those having no practical experience. The exact cause of this is not clear. A number of researchers [15,17,28] observed this and we also noted that those having a previous experience of performing CPR scored higher, although a large number didn't perform too well even after previous exposure.

The designation of the respondent was significantly correlated with the knowledge scores obtained (p < 0.0001). The relation between designation and good score was directly proportional, except a dip in the

Table 1
Breakdown of respondents by knowledge.

GOOD KNOWLEDGE	NUMBER	PERCENTAGE
NO	601	83%
YES	123	17%

Table 2
Stratification of variables.

VARIABLE	KNOWLEDGE REGARDING CPR		p VALUE
	GOOD	POOR	
BY GENDER			
MALE	75	368	1.000
FEMALE	48	233	
ATTENDED FORMAL CPR TRAINING			
NO	7	142	0.0001
YES	116	459	
BY AGE			
LESS THAN THIRTY	60	466	0.000
EQUAL TO AND GREATER THAN THIRTY	63	135	
BY HOSPITALS			
JINNAH HOSPITAL	16	134	0.000
MAYO HOSPITAL	11	142	
MID CITY HOSPITAL	6	14	
PIC	9	43	
SERVICES HOSPITAL	17	141	
SIR GANGA RAM HOSPITAL	59	99	
OTHERS	5	28	
BY SPECIALITY			
ANASTHESIA	5	11	Chi 2 = 727.899 DF = 10 P value < 0.0001
CARDIOLOGY	7	36	
GYN N OBS	5	35	
MEDICINE AND ALLIED	53	260	
SURGERY AND ALLIED	53	259	
BY DESIGNATION			
ASSOCIATE PROFESSOR	6	16	Chi 2 = 801 DF = 20 P < 0.0001
ASSISTANT PROFESSOR	4	5	
CONSULTANT	7	22	
HOUSE OFFICER	17	221	
MEDICAL OFFICERS	22	61	
PG1	8	122	
PG2	13	55	
PG3	22	41	
PG4	24	58	

Table 3
Knowledge based Questions and responses.

Questions	Correct	Incorrect
What is the location of hands for CPR in an adult?	484 (66.9%)	240 (33.1%)
What is the depth of chest compression in adult?	347 (47.9%)	377 (52.1%)
What is the rate of chest compression in adult per minute?	352 (48.6%)	372 (51.4%)
How many mouth breaths do you have to give per minute during CPR in adults?	109 (15.1%)	615 (84.9%)
What is the compression-ventilation ratio in an adult?	599 (82.7%)	125 (17.4%)
Where is the "2 thumb-encircling hands technique recommended when 2 or more rescuers are present" used?	362 (50%)	362 (50%)
What is the position of fingers in infants during CPR?	347 (47.9%)	377 (52.1%)
What is the depth of chest compression in infant?	207 (28.6%)	517 (71.4%)
What is the rate of chest compressions in children per minute?	338 (46.7%)	386 (53.3%)
What is the preferred mode for rescue breathing in infants?	188 (26%)	536 (74%)
What is the compression-ventilation ratio in infants with 2 or more rescuers?	384 (53%)	340 (47%)
What CPR in basic life support stands for?	714 (98.6%)	10 (1.4%)
What is the method for opening airway during CPR in a suspected case of HEAD INJURY?	263 (36.3%)	461 (63.7%)
What should a rescuer give to potentially reduce the risk of gastric inflation?	75 (10.4%)	649 (89.6%)
Is CCR (cardio cerebral resuscitation) better than CPR?	55 (7.6%)	669 (92.4%)

Table 4
Attitude of respondents to CPR.

	Will you do CPR	it is right to do CPR	Permit to do CPR on relative	Allow self CPR	Religion permits to do CPR	CPR is against culture	CPR is useless on old patient	You will do CPR on DNR patients	Bystander should do CPR	CPR is useful in end stage diseases	Have you ever done CPR
Yes May be/ sometimes	679 (93.8%)	633 (87.3%)	679 (93.8%)	633 (87.3%)	623 (85.9%) 88(12.1%)	67 (9.2%)	172 (23.7%)	82 (11.4%)	128 (17.7%)	121(16.7%) 337(46.5%)	629 (86.8%)
No	45(6.2%)	91(12.6%	45(6.2%)	91 (12.6%)	13(1.3%)	657 (90.8%)	552 (76.3%)	642(88.6%)	596(82.3%)	266(36.7%)	95(13.2%)
Score	0.966	0.966	0.4855	0.286	0.836	0.872	0.735	0.000	0.000	0.351	0.001
Gender	0.009	0.162	0.883	0.007	0.014	0.09	0.824	0.563	0.31	0.223	0.00
Age	0.397	0.134	0.414	0.613	0.607	0.667	0.594	0.000	0.043	0.251	0.000
Religion	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.447	0.215	0.333	0.67
Designation	0.445	0.608	0.07	0.07	0.134	0.562	0.658	0.000	0.123	0.456	0.000
Specialty	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.738	0.2	0.1
Hospital	0.626	0.365	0.2	0.013	0.222	0.147	0.468	0.008	0.012	0.000	0.069
Marital status	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.027	0.571	0.002

graph depicting low scores achieved by the consultants who are post fellowship doctors but are not at a teaching post. Such findings were also noted by other researchers who found that non-clinical and less exposed professionals were likely to score less [28]. Other researchers have however found somewhat different results where as the seniority increased the mean score decreased [9,22].

High quality chest compressions are vital part of the chain of survival although the proper delivery of CPR is challenging [4,5,7]. Advancements are being made to improve the quality of cardiac compressions. Mechanical CPR is one of such mean and is being evaluated [21,28]. Although in Pakistan mechanical CPR is not yet available. Only 427 (58.7%) doctors were aware of the mechanical CPR other than the manual CPR.

Attitude is also an important factor in the provision of cardiopulmonary resuscitation [9]. Culture plays a significant role in the emergency decision making regarding CPR. An international survey that had been done in 2019 reported culture as an unrecognized obstacle in the chain of survival. In our study 657(90.8%) doctors didn't consider culture as a barrier in the provision of CPR.

Do not resuscitate (DNR) order is a legal order that has been made to respect the autonomy of the patient [23,30]. A cross-sectional study done in Turkey in 2018 showed that 47.7% of doctors would abide by the patients DNR orders [31]. While in our study, 88.6% of doctors agreed to follow the patients DNRs orders while 87.3% of doctors allowed CPR on themselves in a critical condition. This showed just a slight difference towards self and the others.

Studies [32,33] have shown that with increasing age and co-morbidities the survival rate decreased after CPR and such patients are also more likely to opt for DNR. Most (76.3%) of the doctors we interviewed still wanted to attempt CPR to save the lives of their patients.

Most of the cardiac arrests occur at home or out of hospital [30]. Therefore, bystander CPR is of crucial importance[29] [34]. 82.3% of doctors included in our study didn't think that bystanders should perform CPR without any prior training.

In the present study, the knowledge of the doctors is not satisfactory enough to give the proper CPR. It is of great concern as the patients' lives are in the hands of these doctors. Therefore proper steps should be taken to improve the level of training of the doctors. However, overall attitude of the doctors towards CPR is positive.

Our study included doctors from the six different hospitals of the city. The sample size is large enough to assess the knowledge and attitude of the doctors regarding CPR. However, it is a questionnaire based study so it cannot asses the level of skill and practical approach of the doctors towards CPR on the basis of knowledge. Hence, it is recommended to conduct further studies to assess the skill set of the doctors as well.

4. Conclusion

The overall knowledge of the doctors regarding CPR is not satisfactory. A practical and functional approach is needed to improve the persisting condition. However, the attitude of the doctors towards CPR is positive.

4.1. Limitations

Most of the data collection was done by the medical students who were at times faced with difficulty in data collection. Further 3 hospitals refused permission to conduct the research on their premises. The questionnaire was designed to test the knowledge of the respondents however due to limitation of resources skills couldn't be tested. It might be likely that they may be lacking as well.

No experiment on humans was done in the conduction of this research.

Guarantor

Mahmood Ayyaz.

Declaration of competing interest

NIL.

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