

Original Article

Awareness of CPR among the family members of the patients visiting the hospital. A cross-sectional survey study

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DOI: <https://doi.org/10.3329/bccj.v10i2.62199>

Abstract:

Background: Cardiac arrest is a common cause of morbidity and mortality. In out-of-hospital setting, early recognition of cardiac arrest and bystander-initiated cardiopulmonary resuscitation (CPR) improves both the chance of survival and quality of life.

Objectives: The study aimed to explore awareness regarding cardiac arrest and knowledge of CPR among visitors of patients at a tertiary level hospital.

Design: Cross sectional study.

Method: The validated and tested self-administered questionnaire were distributed among 394 visitors of the patients admitted at Alka Hospital Pvt. Ltd, Lalitpur, Nepal.

Results: Our study demonstrated that 221 (56.1%) of the respondents have knowledge regarding CPR and 201 (51.0%) of respondents have awareness about cardiac arrest through medias (37.8%) like movies and television. We found a significant difference among age group, occupation and geographical location regarding awareness of cardiac arrest. People with greater age and education knew better about cardiac arrest. There was, however, no significant difference amongst groups regarding knowledge of CPR. Very little respondents have heard about automated external defibrillators (AED).

Conclusions: There is paucity in knowledge of cardiac arrest and CPR among respondents. Similarly, there is a general lack of knowledge regarding AED. Effective programs to raise the awareness of cardiac arrest and knowledge of CPR needs to be undertaken at the community level to reinforce bystander-initiated CPR and potentially save lives in the scenario of out-of-hospital cardiac arrest.

Key words: awareness, basic life support, cardiopulmonary resuscitation, out-of-hospital cardiac arrest.

Introduction:

Cardiopulmonary resuscitation (CPR) is an emergency lifesaving procedure performed when the heart stops beating. Immediate CPR can double or triple the chances of survival after cardiac arrest. For every minute without CPR, survival from witnessed ventricular fibrillation decreases by 7-10%. CPR along with defibrillation within 3-5 minutes of collapse can produce survival rates as high as 49-75%¹ The initial guidelines for CPR were published in 1966 by an ad hoc CPR Committee of the Division of Medical Sciences, National Academy of Sciences – National Research Council. This was done in response to requests from several organizations and agencies about the need for guidelines regarding the training.²

Since its inception, CPR guidelines have been reviewed, updated and published periodically by the American Heart Association (AHA) as per necessity transitioning from initial 5-yearly update to an online format using continuous evidence evaluation which led to significant changes in initial guidelines based on evidence.³ Over the years, cardiac arrest still remains the leading cause of morbidity and mortality all over the world.⁴ CPR has moved beyond initial ABCD (airway, breathing, circulation, definitive therapy) approach to that of modern resuscitation where emphasis is given to the chain of survival, to maximize the chance of survival from cardiac arrest.^{2,3}

For improving the survival of the victims of out-of-hospital cardiac arrest (OHCA), the community response is a key factor.^{5,6} When the first person to witness OHCA uses an automated external defibrillator (AED), the chance of survival doubles.⁷ Basic Life Support (BLS) is an essential part of emergency resuscitation that saves people from sudden cardiac arrest, myocardial infarction, stroke and choking and targets to restore sufficient ventilation and circulation to support life.⁸

A study done in China on 2017 showed that 544,000 sudden cardiac deaths occurred in China each year with survival less than 1%.⁹ The typically low rate of bystander CPR (<25%) of arrested victims could be because of fear of causing harm to the patient, difficulty in learning the skill and aversion from mouth ventilation. There may be cultural factors which prevents one from delivering mouth ventilation. Bystander-initiated CPR with either cardiac only resuscitation or conventional CPR improves outcomes from witnessed cardiac arrests of ≤ 15 minutes duration.¹⁰

Many studies done in the past have shown the paucity of knowledge regarding the CPR among general (non-medical) people and there needs to be trainings to improve the confidence of people so that they can be useful and fearless during bystander-initiated CPR. Also the studies indicate that there are various methods to improve the knowledge

regarding CPR and media may play a significant role as it can reach a wider audience.^{7,8,11}

Material and Methods:

We designed an analytical cross-sectional study regarding knowledge of Cardiopulmonary resuscitation (CPR) that was conducted between December 1, 2021 to December 31, 2021. It was conducted among visitors of patients at Alka Hospital Pvt. Ltd, Jawalakhel, Lalitpur. This is a private hospital setting with 100 beds and caters for the need of patients from all socioeconomic strata. The sample size was determined by using a single population proportion formula with the assumptions of 95% level of confidence, 5% error of margin, taking 50% for basic life support proportion and 5% non-response rate. Taking these assumptions, the initial sample size was 385. Considering the 5% non-response rate, the final sample size was 406.

The questionnaire consisted of 2 sections with first 5 questions including demographic data. The second half contained 16 questions to determine the knowledge of cardiac arrest and CPR. The validation of the questionnaire was done by sending them to five experts. After validation, a pilot study was done in 10% of the calculated sample size (41 participants). Data collection was done after obtaining written informed consent. Confidentiality of the response of participants was maintained. The collected data were entered in MS Excel and exported to Statistical Package for Social Sciences (SPSS) version 16 for analysis. A p value of <0.05 was considered statistically significant at 95% confidence interval.

Result:

Of the 406 participants enrolled in the study, twelve denied to participate. So, data were collected from a total of 394

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patients' visitors. The response rate was 97%. The age of respondents ranged from 18 to 67 years with a mean of 39.19 and Standard deviation of 12.12 years. The majority of the respondents belonged to 40-50 years age group. Of the participants, 35.5% were businessman by occupation and around one-fourth (29.9%) of respondents had education of higher secondary level. Majority (73.1%) of them were from Province 3 (Bagmati) province followed by Province 2.

About 56.1% have knowledge regarding CPR and 51% of respondents were aware about cardiac arrest. Media (37.8%) like movies, television etc were the major source of knowledge. Since 107 respondents had incomplete answer regarding knowledge of cardiac arrest or CPR, results were further analysed among 287 respondents.

Data showed that nearly half of the respondents have no knowledge regarding condition confirming cardiac arrest. Most of them think that no response while shaking and calling confirms cardiac arrest. Whereas 39.7 % of the respondents thought that all the signs like no chest movement, no breath sound, no air outlet from nose and mouth during respiration were respiratory symptoms of cardiac arrest. However, 36.6% of respondents considered "no movement in patient body" and "no pulse in neck vein" as cardiac symptoms for cardiac arrest.

It was found that 41.4% of respondents had seen someone fainting and during which 32.5 % of them responded by calling somebody to help. In the study, 29 (10.10%) respondents were found to have attended CPR training among which 7.31% of them had performed CPR. But interestingly, 77% of the respondents were eager to perform CPR if necessary. Among those who do not want to perform CPR (22.99%), the major reasons were the lack of knowledge, risk of infection and perception that there is no benefit from CPR. About one-third of the respondents (33.79%) consider both chest compression and mouth to mouth respiration as CPR. Regarding automatic external defibrillator only 8 (2.78%) respondents had heard about it. Five considered it as device used during CPR whereas three respondents thought the device is used to detect life threatening cardiac arrhythmias.

The relationship between socio-demographic characters and knowledge of cardiac arrest were compared. The result revealed that there was significant difference between age group ($p=0.005$), occupation ($p=0.001$), education of respondents ($p <0.0001$) and awareness about cardiac arrest among the respondents. Therefore, the study showed that younger the age and higher education, better was the awareness regarding cardiac arrest. In addition to that, among all occupations, health workers were most aware of cardiac arrest (100%) followed by the government officials (Table 1).

Table-1: Awareness about cardiac arrest

Variables	Awareness about Cardiac Arrest		COR (95%CI)	p-value
	Yes	No		
Age group (in years)				
<20	9(64.3%)	5(35.7%)	6.18(1.81-21.10)	0.005
20-30	45 (42.1%)	62(57.9%)	2.49(1.26-4.90)	
30-40	31(40.3%)	46(59.7%)	2.31(1.12-4.75)	
40-50	36(28.8%)	89(71.2%)	1.39(0.70-2.73)	
>50	16(22.5%)	55(77.5%)	RC	
Occupation				
Entrepreneur	13(48.1%)	14(51.9%)	3.84(1.25-11.77)	0.001
Farmer	5(29.4%)	12(70.6%)	1.72(0.45-6.52)	
Homemaker	23(31.1%)	51(68.9%)	1.86(0.71-4.88)	
Businessman	37(26.4%)	103(73.6%)	1.48(0.60-3.68)	
Government job	12(70.6%)	5(29.4%)	9.94(2.62-37.60)	
Nongovernment job	16(39%)	25(%)	2.65(0.94-7.47)	
Health workers	2(100%)	0(0%)	-	
Student	22(59.5%)	15(40.5%)	6.07(2.11-17.44)	
Retired	0(0%)	3(100%)	-	
Others	7(19.4%)	29(80.6%)	RC	
Education				
Illiterate	2(18.2%)	9(81.8%)	0.44(0.026-7.66)	0.00001
Knows how to read and write	6(12.8%)	41(87.2%)	0.29(0.02-3.74)	
Primary level	0(0%)	3(100%)	-	
Secondary level	23(34.8%)	43(65.2%)	1.07(0.09-12.43)	
Higher secondary level	27(22.9%)	91(77.1%)	0.59(0.05-6.79)	
Bachelor	49(51%)	47(49%)	2.08(0.18-23.76)	
Masters	29(58%)	21(42%)	2.76(0.23-32.49)	
PHD or similar	1(33.3%)	2(66.7%)	RC	
Province				
Province 1	6(25%)	18(75%)	0.33(0.053-2.11)	0.21
Province 2	11(21.6%)	40(78.4%)	0.27(0.04-1.55)	
Bagmati Province	107(37.2%)	181(62.8%)	0.59(0.11-2.98)	
Gandaki Province	6(100%)	0(0%)	-	
Lumbini Province	3(17.6%)	14(82.4%)	0.21(0.02-1.63)	
Karnali Province	1(50%)	1(50%)	1.00(0.04-24.54)	
Sudur Paschim Province	3(50%)	3(50%)	RC	

COR: Crude odds ratio, RC- Reference Category, CI -Confidence Interval

There was no significant relationship between knowledge of CPR and age, occupation and education of the respondents (Table 2).

Table-2: Knowledge of CPR

Variables	Knowledge of CPR		COR (95%CI)	p-value
	Yes	No		
Age group (in years)				
<20	6(42.9%)	8(57.1%)	0.72 (0.22-2.31)	0.51
20-30	65(60.7%)	42(39.3%)	1.50 (0.82-2.75)	
30-40	41(53.2%)	36(46.8%)	1.10 (0.58-2.11)	
40-50	73(58.4%)	52(41.6%)	1.36 (0.76-2.45)	
>50	36(50.7%)	35(49.3%)	RC	
Occupation				
Entrepreneur	18(66.7%)	9(33.3%)	RC	0.05
Farmer	5(29.4%)	12(70.6%)	0.20 (0.05-0.77)	
Homemaker	35(47.3%)	39(52.7%)	0.44 (0.17-1.12)	
Businessman	78(55.7%)	62(44.3%)	0.62 (0.26-1.12)	
Government job	14(82.4%)	3(17.6%)	2.33 (0.53-10.26)	
Nongovernment job	28(68.3%)	13(31.7%)	1.07 (0.38-3.03)	
Health workers	2(100%)	0(0%)	-	
Student	24(64.9%)	13(35.1%)	0.92 (0.32-2.62)	
Retired	0(0%)	3(100%)	-	
Others	17(47.2%)	19(52.8%)	0.44 (0.15-1.25)	
Education				
Illiterate	3(27.3%)	8(72.7%)	0.18 (0.01-2.91)	0.08
Know read and write	18(38.3%)	29(61.7%)	0.31 (0.02-3.67)	
Primary level	2(66.7%)	1(33.3%)	1.00 (0.03-29.80)	
Secondary level	37(56.1%)	29(43.9%)	0.63 (0.05-7.38)	
Higher secondary level	68(57.6%)	50(42.4%)	0.68 (0.06-7.70)	
Bachelor	57(59.4%)	39(40.6%)	0.73 (0.06-8.34)	
Masters	34(68%)	16(32%)	1.06 (0.09-12.59)	
PHD or similar	2(66.7%)	1(33.3%)	RC	
Province				
Province 1	19(79.2%)	5(20.8%)	0.76 (0.07-8.06)	0.007
Province 2	34(66.7%)	17(33.3%)	0.40 (0.04-3.70)	
Bagmati Province	156(54.2%)	132(45.8%)	0.23 (0.02-2.04)	
Gandaki Province	4(66.7%)	2(33.3%)	0.40 (0.02-6.17)	
Lumbini Province	1(5.9%)	16(94.1%)	0.01 (0.00-0.23)	
Karnali Province	2(100%)	0(0%)	-	
Sudur Paschim Province	5(83.3%)	1(16.7%)	RC	

COR: Crude odds ratio, RC: Reference Category, CI: Confidence Interval

Discussion:

Out-of-hospital cardiac arrest (OHCA) is a major public health challenge, with a global incidence among adults of 55 OHCA per 100,000 person-years.¹² The worldwide survival after OHCA remains poor. Early initiation of quality CPR and the use of AED significantly improved survival and long term outcomes according to various studies.¹³

This study was designed to know about the knowledge of CPR among visitors of patients in a tertiary level hospital. Although the CPR training is incorporated in medical and allied curriculum, there is a lack of training for community people who could prove to be a valuable support to initiate bystander CPR. It is pertinent that the people of community be educated regarding CPR.

In this cross-sectional study, we tried to find out the level of awareness in general public regarding cardiac arrest and knowledge of CPR. Our study shows that around half of the people who responded (51.0%) were aware regarding cardiac arrest and 56.1% had heard about CPR. Those respondents who answered yes to awareness of cardiac arrest, most of them acquired the information from social media.

When compared among different age groups, occupation and educational levels, the results were significant regarding awareness of cardiac arrest but the results were not statistically significant regarding knowledge of CPR.

We compared our findings with several other studies which tried to explore the knowledge and awareness regarding CPR. In a study done in China on 2017 by Meng Chen et al. 90.1% understood what CPR is, however, out of 25.6% participants who were trained to perform CPR, only 50.8% knew the standard procedure to perform CPR.¹¹ A similar study done in Turkey explore the knowledge of cardiac arrest, previous experience of CPR and other relevant subjects. Among the participants, around half (57.2%) of the participants thought that “No response when called” is a sign of cardiac arrest. Only 9.20% of the population were able to identify all signs of cardiac arrest.¹⁴

In our study, only 7.31% had performed CPR at some point and 10.10% had formal CPR training. Interestingly, 77.0% of the respondents believed that they would be able to perform CPR should the need arise. This is in sharp contrast to the above-mentioned study by Meng Chen et al. where majority of respondents knew about CPR. In a study done in Ghana, West Africa, 80% of the non-medical people knew about CPR which is different from our study and 90% of them had never received CPR training. Regarding willingness of performing CPR, most of the respondents were willing to perform CPR preferentially on their spouses, relatives and children than other members of the community.¹⁵

When asked about reason for not performing CPR, most of the respondents (79.7%) responded that it is because of lack of knowledge regarding CPR. A smaller percentage (17.39%) believed that there is a risk of infection while performing CPR and a few respondents (2.89%) believed that there is no benefit from performing CPR. A study done by Abbas HA et

al. in Jeddah, Saudi Arabia showed that most of the respondents (47.2%) were reluctant to perform CPR because of possibly causing further harm, followed by 34.6% who feared taking responsibilities and 4.5% who were afraid that they may acquire infection by doing so.⁸ A similar study found that most of the concerns regarding CPR were clustered around making mistakes, causing bone fractures, organ damage and fear of litigation among others.⁷

Also, this study showed that younger the age and education, better was the awareness regarding cardiac arrest. A study done in northern Saudi Arabia demonstrated that education level has positive impact on general awareness and knowledge about CPR. Similarly, a study done in Delhi showed overall poor knowledge of CPR; 43.5% of population among 200 participants were aware of CPR and in general, people in medical profession were more aware regarding CPR than people in other profession.¹⁶ Other factors like older age, lesser education and lower income were associated with reduced likelihood of CPR training.¹⁷ In addition to that, among all occupations, entrepreneurs were more aware of cardiac arrest than other occupation groups. A study done in Korea in 2020 targeted the family members of patients living with coronary artery disease and evaluated the difference in CPR related indicators. They classified the study population into different social strata like managers, clerks, sales workers, agriculture and manual labour workers. They demonstrated that for successful CPR at pre-hospital level, it is important to increase the ability of family members to perform CPR especially those in agriculture, forest and fishery and those who are unemployed.¹⁸

Only a minor (2.78%) of the respondents have heard about automated external defibrillator (AED) and about one-third of them had the opinion that it is a device used to detect life-threatening arrhythmia and rest of them believed it to be a device used during CPR. Various studies have been done to assess the knowledge and awareness to use AEDs have shown that many factors including limitation of knowledge regarding operation of AED, lack of training, accessibility and public awareness were among many factors influencing the use of AEDs.^{19,20} In our case, the availability and education regarding the use of AEDs may be a limiting factor for such poor knowledge of device amongst majority of the respondents.

The knowledge regarding CPR did not show any statistically significant variation among age, educational qualification or profession. The reason for this may be due to the fact that there is no formal CPR training in educational institutes or at community level which leads to more or less similar level of knowledge among different population with regards to age, qualification or profession.

Our study has several limitations. It was conducted in a single center. The participants were predominantly from Bagmati province, limiting the generalizability of the findings. Further studies involving participants evenly from all the provinces may confer a more generalizable picture, that can help in policy making and planning to formulate training programs on CPR for lay-persons.

Conclusion:

There is paucity of knowledge regarding CPR and AED among the respondents. The various factors influencing the results may be education level, geography, availability of devices, incorporation of CPR in curriculum and hands-on training of CPR. Programs to raise awareness and conducting CPR training programs at community level may help to improve knowledge about CPR among lay persons.

Conflicts of interest: None

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