



Research Article

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Awareness of Cardiopulmonary Resuscitation (CPR) among Firemen in 2016/2017 Riyadh, Saudi Arabia

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ABSTRACT

Background: Any subject that knows about Cardiopulmonary Resuscitation (CPR) will be able to save many lives. So imagine how vital would be the role of CPR in a profession specially that of firemen. Logically, all firemen should have the knowledge and awareness regarding CPR, but is that really the case? **Objective:** Assessing the knowledge level, causes of poor knowledge of CPR and the attitude towards CPR training courses among firemen in Riyadh, Saudi Arabia. **Methodology:** This was a cross-sectional study on 72 firemen from Riyadh city. A questionnaire was used for the data collection. **Results:** From the 72 respondents, 68.1% had knowledge of what CPR was, 30.6% were able to formally attend a CPR training course, 52.8% were interested to attend a CPR training course and only 25.0% were offered a CPR training course. **Conclusion:** A substantial number of firemen have sufficient CPR knowledge, and the majority of them value the importance of CPR in their line of work. There were minimal CPR training courses offered towards firemen.

Key words: Awareness, Firemen, Cardiopulmonary resuscitation, Training program

INTRODUCTION

Cardiopulmonary Resuscitation (CPR) is a lifesaving technique that is useful in many emergencies such as electrocution injuries, heart attacks or any other medical emergencies where a person's breathing or heartbeat are stopped. It involves a combination of rescue breathing and chest compressions, that keep oxygenated blood flowing to the brain and other vital organs until more definitive medical treatment can restore it back to a normal heart rhythm. The earlier CPR is performed, the greater is the chance of a successful resuscitation [1-4].

Firemen have a significant role in the community as they handle a lot of critical situations where no one else might be there except them. They face so many accidents that require their intervention at the spot before the ambulance or CPR team arrives, that is why it is important to assess their knowledge about CPR, because if they have the proper knowledge and training, many lives will be saved.

We began this study to assess the level of awareness of CPR knowledge, to identify the predisposing factors that contribute to poor CPR knowledge and to assess the view of firemen towards a suggested CPR training course in Riyadh, Saudi Arabia.

We have done many local studies to assess the knowledge of different parts of the society regarding CPR; for example, a study in Al-Khobar city, KSA was done to analyze public awareness and knowledge of pediatric CPR on people visiting Dammam University Hospital. Another local study was done among King Saud University

students, Riyadh, Kingdom of Saudi Arabia, to assess the knowledge and attitudes towards cardiopulmonary resuscitation.

But there were no local studies implemented on firemen. In our research, we chose them as our target population because they are considered among the subjects that face life-threatening situations on a daily basis, which makes CPR training a vital issue [5-8].

A study was designed to assess the general knowledge, degree of preparedness, and the concern regarding CPR training in the Polish population. The results of this study indicated that 1- Approximately 75% of the Polish population had received CPR training; 2- The majority of the surveyed population had an inadequate CPR ability; 3- The surveyed population believed that CPR training had to be expanded and improved. At last, considering the results of the CPR knowledge assessment questions, they concluded that the Poland population knowledge of CPR was low and that a standardized curriculum for CPR training was needed [9].

In addition, a study was done regarding the Police officer's response to the injured officer in order to assess medical decision-making capabilities of the law enforcement personnel under these circumstances in Minnesota USA in 2007. Thirty-eight key actions were predetermined for nine injured officer scenarios, with each correct action worth one point. Descriptive statistics and t-tests were used to analyze the results. The majority of officers (68.0%) were trained to the first-responder level. As assessed through the nine scenarios, Tactical medical decision-making capability was sub-optimal [10].

A study was done in Pittsburgh to assess the role of law enforcement agencies in out-of-hospital emergency care and the proportion of law enforcements that provide medical care and use automated external defibrillators (AEDs). The results showed that approximately 75% of respondents agreed that law enforcement agencies had to provide initial emergency medical care and indicated that officers in their agency would be willing to receive additional training to accomplish this [11].

Another study that sought to assess the involvement of law enforcement agencies in out-of-hospital emergency medical care and their attitudes toward expanded roles in emergency medical services (EMS) systems, concluded that 60% of respondents agreed that law enforcement agencies had to be involved in providing emergency medical services for life-threatening emergencies, that their officers would be willing to undertake extra medical training and that EMS-related activities would improve their public images [12].

All the local and international studies highlighted the point that adoption of Cardiopulmonary Resuscitation programs is needed, and that most study participants have not previously attended a CPR training program. The studies also showed that after the educational trial, most study participants benefited from them.

METHODOLOGY:

This was a quantitative cross-sectional survey study that has been conducted in Riyadh city, the capital of Saudi Arabia. A questionnaire was used for data collection, it consisted of two sections, the first section included participant demographic characteristics (age, gender, marital status, educational level, occupation, years of experience, income, working place, residence, and hand dominance). The second section consisted of 15 close-ended questions that assessed the knowledge of CPR.

Assuming 50% of knowledge of CPR, with $\pm 5\%$ of width of 95% confidence interval (CI), the sample size was calculated using the sampling size formula for a single mean. The sample size was estimated to be 384. Assuming a 20% non-response, the sample size was increased to 460. The sample size was acquired from a cluster randomized sampling technique.

The study participants were firemen from the main Saudi civil defense center in Riyadh city and all stations under their supervision. The questionnaire was submitted to the main defense civil center, and from there it was distributed to all their centers.

The Institutional Review Board (IRB) of King Saud University (KSU) approved the study. All firemen who agreed to participate in the current study and filled out the questionnaire signed a written consent form that was attached together with the distributed questionnaire. From the 460 questionnaires that were distributed, only 72 were filled out and returned back to us, giving a very low response rate of 15.6%. Many reasons could justify this very low response rate including: the limited time and our obligation to certain deadlines, which made us recollect the questioners earlier than they should have been recollect. Another reason could be that some of the participants were not interested in the study. Also, none of the authors who conducted the study were there to explain or answer any misunderstandings that might have faced the firemen.

Statistical Analysis: Analysis was done using Statistical Package for Social Sciences (SPSS) version 21 (SPSS Inc., Chicago, Illinois, and USA). Frequencies were expressed as numbers and percentages. Factors associated with knowledge were done by Chi-square test (χ^2). P-values less than 0.05 was considered statistically significant.

RESULTS:

There were 72 firemen who responded to the survey, all were males and all were working in Central Region of Saudi Arabia. The majority of participants ($n=44$, 61.1%) were aged between 20 and 30 years old, 25 (34.7%) were between 31 and 40 years old. Fifty-two (72.2%) were married. Fifty-seven (79.2%) respondents had secondary education, and 10 (13.9%) had college degrees. Twenty (27.8%) were sergeant, and 16 (22.2%) were corporal. The majority ($n=70$, 97.2%) of the respondents worked more than 3 years, and the monthly income was more than 5,000 SR for 70 respondents (97.2%). Table 1 shows the demographic characteristics of the 72 respondents.

Table 2 shows the responses to the questions about Cardiopulmonary Resuscitation (CPR). There were 49 (68.1%) respondents who had knowledge of what CPR is. Among them, there were 48 (66.7%) respondents who were able to witness somebody performing a CPR. There were only 22 (30.6%) respondents who were able to formally attend a CPR training course. There were 38 (52.8%) participants who were interested to attend a CPR training course, however there were only 18 (25.0%) who were offered a CPR training course. Most of the respondents who were not able to train / not interested with CPR claimed that there were no CPR training courses offered to them ($n=33$, 45.8%). Among the 72 respondents, 53 (73.6%) thought that CPR was important to their work. There were 42 (58.3%) respondents who thought that CPR was very important, and 49 (68.1%) thought that the survival of the patient increased with CPR.

Table 3 shows the association between demographic characteristics and knowing what is CPR. Based on their educational level, the highest percentage in both the two educational level groups knew what was CPR, and the percentage was higher in the secondary or less compared to the university or more educational level at 67.8% and 66.7%, respectively; however, such difference between the two groups was statistically non-significant ($P=0.59$). Results showed that higher percentage (75.0%) of participants with long experience (>10 years) knew what was CPR compared to those with experience of <10 years (65.1%), with no statistical significant difference ($P=0.37$). A higher percentage (68.9%) of young participants (aged < 30 years) were aware that what is CPR compared to old age group (>30 years) but the difference was non-significant. Additionally, there was no statistically significant difference between the income level and the knowledge about CPR among the studied cohort.

DISCUSSION:

Based on the literature review, there were no studies conducted among firemen in Saudi Arabia. In our research we selected firemen as our target population because they are usually the first respondents to critical situations that may involve resuscitating victims from life-threatening situations, and this makes Cardiopulmonary resuscitation (CPR) training a vital issue among firemen. A good number of firemen as seen in the results had the sufficient knowledge about CPR and understood the importance of CPR to their work field. The obstacle was that there were no training courses offered. In comparison to the previous study done in Dammam Saudi Arabia [13], among school health advisers, the authors concluded that 80.8% of females and 86.5% of males who participated in the study did not have the sufficient knowledge of basic life support (BLS) and first aid (FA), whereas in our study, there were 23 (31.9%) males that did not know what CPR meant. The difference in the result between the two studies might have happened because of the difference in the population that we have chosen and the sample size used. As demonstrated, our study targeted different occupants and had different results regarding the knowledge and importance to this specific population and that is due to the firemen's lifestyle and their exposure to different circumstances that encourage them to learn about CPR and first aid.

We found that the majority of the participants had the knowledge and the will to learn about CPR, but were not offered any training courses; therefore, the solution is to offer them CPR training courses.

There are many other sectors in the governmental area that should be tested for their knowledge about CPR due to the importance of it.

The result of CPR awareness among firemen in this current study lead us to infer that many firemen thought that CPR was important to their work and were interested in attending training programs.

Strengths and Limitations:

Strengths:

The questionnaire gathered information that was sufficient to answer all the objectives of our study. It also gave the respondents enough time (3 weeks) to comfortably answer the questionnaire, and it was also straight to the point.

Limitations:

The current study had some limitations, one of which was that the data was not collected from face-to-face interaction between the researcher and the firemen, so there were many problems that resulted from that. In addition, we could not gather the data as fast as possible, and if they needed to ask questions, there was no one there to answer them.

Another limitation was that the number of respondents was very low despite distributing the questionnaires to more than one center, and this might be explained by that firemen were not interested to participate in the study and we did not collect the data by ourselves. Additionally, we did not distribute the questionnaire to all of the centers.

CONCLUSION:

A substantial number of firemen in Riyadh city have sufficient knowledge about CPR, and majority of them value the importance of CPR to their line of work. However, only few of them are offered courses on CPR, and almost half of them are kept away from learning CPR because of no training courses to be offered.

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Table 1: Demographic characteristics

Demographic Characteristics	n	%
Age in Years		
<20 Years Old	1	1.4
20 – 30 Years Old	44	61.1
31 – 40 Years Old	25	34.7
41 – 50 Years Old	1	1.4
>50 Years Old	1	1.4
Gender, Males	72	100
Marital Status		
Single	19	26.4
Married	52	72.2
Divorced	1	1.4
Educational Level		
Primary	1	1.4
Intermediate	2	2.8
Secondary	57	79.2
College	10	13.9
Master	2	2.8
Rank		
Corporal	16	22.2
Private	14	19.4
Lance Corporal	6	8.3
First Lieutenant	1	1.4
Chief Sergeant	1	1.4
Sergeant	20	27.8
Staff Sergeant	6	8.3
Agent Sergeant	8	11.1
Years at Work		
1-2 Years	2	2.8
3-5 Years	22	30.6
6-10 Years	19	26.4
>10 Years	29	40.2
Monthly Income		
<5,000 SR	2	2.8
5,000 – 10,000 SR	36	50.0
>10,000 SR	34	47.2
Residence		
Northern	1	1.4
Southern	2	2.8
Western	1	1.4
Central	68	94.4

Table 2: Assessment of firemen CPR knowledge

Questions on Cardiopulmonary Resuscitation	Yes (n,%)	No (n, %)
Do you know what is CPR?	49 (68.1)	23 (31.9)
Have you seen or witnessed somebody doing CPR?	48 (66.7)	24 (33.3)
Have you attended a CPR training?	22 (30.6)	50 (69.4)
Are you interested to learn CPR?	38 (52.8)	34 (47.2)
Do you think CPR is important to your work?	53 (73.6)	19 (26.4)
Was there CPR training courses offered to you?	18 (25.0)	54 (75.0)
Do you think simple first aid and CPR knowledge should be compulsory in the driver's license written test?	46 (63.9)	26 (36.1)
	n	%
How important is it for you to know about CPR?		
Very Important	42	58.3
Important	13	18.1
Maybe Important	11	15.3
Not Important	6	8.3
Where did you get your information about CPR?		
Television	23	31.9
Books and Articles	11	15.3
Training Institutes	21	29.2
Friends and Relatives	6	8.3
Others	11	15.2
What keeps you away from learning how to do CPR		
I am not interested	4	5.6
It is not important to my work	9	12.5
Will not do much for the patient	3	4.2
No training offered	33	45.8
Others	7	9.7
No Response	16	22.2
Who arrives first in an emergency situation?		
Policeman	8	11.1
Fireman	59	81.9
Ambulance	4	5.6
No Response	1	1.4
What do you think are the survival outcomes of CPR?		
CPR increases the patient's survival rate	49	68.1
The patient does not benefit much from CPR	14	19.4
The patient's quality of life is not affected after CPR	1	1.4
No Response	8	11.1
What did you do when you witness a patient for CPR? (multiple responses)		
I did CPR on the patient	19	26.4
I called for help	26	36.1
I called the ambulance	14	19.4
I took the patient to the hospital	8	11.1

I did nothing	10	13.8
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Table 3: Association between demographic characteristics and knowing what is CPR?

Demographic Characteristics	Do you know what CPR is?		
	Yes (n, %)	No (n, %)	P value
Educational Level			
Secondary or Less	40(67.8)	19(32.2)	0.593
University or More	8(66.7)	4(33.3)	
Years at Work			
≤10 Years	28(65.1)	15(34.9)	0.379
>10 Years	21(75.0)	7(25.0)	
Age			
≤30 Years Old	31(68.9)	14(31.1)	0.845
>30 Years Old	18(66.7)	9(33.3)	
Monthly Income			
≤10,000 SR	25(67.6)	12(32.4)	0.994
>10,000 SR	23(67.6)	11(32.4)	