

## The knowledge of infant CPR among parents visiting Maternity and Children Hospital (MCH) in Al -Ahsa, Saudi Arabia

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### Abstract

**Background:** CPR (cardiopulmonary resuscitation) is a medical procedure that anyone can learn which can help to save a life in the event of a medical emergency. Resuscitation Council UK report that for every minute that a person in cardiac arrest does not receive CPR its survival chance drops by up to 10%. However, an inadequate public awareness and knowledge of infant and pediatric CPR have been documented. Therefore, parents and caregiver should be educated about infant CPR which can help in correctly implementing it and save the life of infant. This study was conducted on the mothers attending the MCH for the baby care is to assess their knowledge on infant CPR skill.

**Material and methods:** This was a Cross sectional study conducted at Maternity and Children Hospital (MCH) in AL-Ahsa. All the parents visiting MCH with their children for the treatment were the study population. The website Raosoft was used to calculate the sample size (n=284). Convenient sampling technique was used to collect the sample. Pretested and predesigned self-reported questionnaire from the previous regional study was distributed to the selected sample participants. The data were entered and analyzed by using the SPSS; version 21. Descriptive statistics were presented using counts, proportions (%), mean  $\pm$  standard deviation whenever appropriate. Descriptive statistics (e.g. number, percentage) and analytic statistics using Chi Square tests ( $\chi^2$ ) to test for the association and/or the difference between two categorical variables were applied. A p-value equal to or less than 0.05 was considered statistically significant.

**Results:** A total of 254 out of 284 subjects responded the questionnaires. The mean age of the participants was 38.65 years  $\pm$  Std. Dev. 9.90 years. The majority of the participants (61.0%) were graduate. Almost sixteen percent (15.7%) of the participants had family history of heart disease. Fifty percent of the participants had attended the CPR course. An overwhelming majority of the participants (87.0%) were willing to take a short course of infant CPR if it is available in MCH. The mean knowledge score in infant CPR of the participants was 2.42  $\pm$  Std.Dev.1.33 (Range 00-6). More than forty one percent of the participants had poor knowledge regarding Infant CPR while 58.7% had good knowledge. As educational qualification increased the percent of good knowledge significantly also increased. The participants who did not have the family history of cardiac disease were having significantly good knowledge about infant (P=0.01). Those participants who had attended infant CPR course had significantly higher knowledge score than those who did not attend the infant CPR course (76.37% vs.40.94%, P=0.000) Those participants who were not willing to take a short course of infant CPR had significantly better knowledge score on infant CPR as compared to those participants who were willing to join the course on infant CPR (69.69% vs.57.01%, P=0.021).

**Conclusion:** The present study has shown a better knowledge among the females regarding infant CPR as compared to other studies conducted in Saudi Arabia. The participants in this study were found very motivated to learn the skills of infant CPR. However there is a need to develop programmes for teaching the infant CPR to the mothers at all level of health care facility attending the MCH, Al Ahsa.

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**Keywords:** CPA; Infant CPR; Knowledge; MCH

## 1 Introduction

Cardiac arrest is a condition characterized by a sudden cessation of blood circulation to the body leading to hemodynamic instability. A majority of pediatric Cardio Pulmonary Arrest (CPA) are among infants (72.7 per 100,000 person-years for infants; 3.73 per 100,000 person-years for children; 6.37 per 100,000 person-years for adolescents) (4). The outcome of CPA in children is reported to be generally very poor, with high rates of mortality and morbidity, and survival rates remains between 0% and 27%.<sup>[1]</sup> A study from Singapore reported that only 4 out of 85 children who presented with out-of-hospital CPA to a children's emergency department survived to discharge, and all survivors had neurological deficits. Among the pediatrics age groups, survival was the highest among children (9.1%) and adolescents (8.9%) when compared to infants (3.3%). Dysrhythmia was reported to be the most common cause of CPA while other causes include trauma, sudden infant death and respiratory disease.<sup>[2]</sup> According to latest data from the American Heart Association (AHA), the outcome of cardiopulmonary arrest in infants and children is different among out-of-hospital and in-hospital cardiac arrest. Only 8.4% of pediatric patients who have out-of-hospital survive to discharge, and most are neurologically impaired, while the in-hospital survival rate is 24% with a better neurological outcome.<sup>[3]</sup> It is imperative for the families and caregivers of young children to know the proper way to administer Cardiopulmonary Resuscitation (CPR) at appropriate time which is different from the adult CPR. Resuscitation Council UK report that for every minute that a person in cardiac arrest does not receive CPR its survival chance drops by up to 10%.<sup>[4]</sup>

CPR (cardiopulmonary resuscitation) is a medical procedure that anyone can learn that can help to save a life in the event of a medical emergency. If a person's heart stops beating, or they stop breathing, it takes four to six minutes Performing CPR on a person whose heart has stopped beating during these vital few minutes can help to keep blood and oxygen flowing through the body to vital organs, including the brain. This can help to keep the person alive until emergency medical help arrives at the scene. Medical emergencies can happen anywhere and to anyone, so CPR training is vital for employees in all sectors. Skills learned during CPR training can be equally as valuable outside of the workplace as in, equipping individuals with the skills and knowledge they need to improve a friend or family member's chance of survival if their heart stops outside of a medical setting.

However, various studies have shown deficient knowledge about CPR among mothers. A Saudi study has found that only 11% of the mothers had good knowledge about infant CPR and majority (89.4%) of them never attended CPR course. However 89.1% of them were willing to join the CPR course in this study.<sup>[1]</sup> In a similar study conducted in Saudi Arabia, the researchers have found that majority of the participants subjects failed to perform mouth-to-mouth resuscitation and/or chest compression. Overall only 15.5% of all female participants had attended some CPR course.<sup>[4]</sup> An inadequate public awareness and knowledge of infant and pediatric CPR have also been documented in other previous studies. Therefore, parents and caregiver should be educated about infant CPR which can help in correctly implementing it and save the life of infant. This study was conducted on the mothers attending the MCH for the baby care is to assess their CPR skill.

## 2 Material and methods

This was a Cross sectional study conducted at Maternity and Children Hospital (MCH) in AL- Ahsa. All the parents visiting MCH with their children for the treatment were the study population. The website Raosoft was used to calculate the sample size (n=284) which was calculated based on the parents visiting MCH of Al-Ahsa assuming a confidence level of 95% and margin of error at 5% and a power of 80%. Convenient sampling technique was used to collect the sample. The sample was selected anonymously from the patients visiting the MCH outpatient department. Pretested and predesigned self-reported questionnaire from the previous regional study was distributed to the selected sample participants. The questionnaires consisted of 2 section .Section 1 contained the sociodemographic information such as age, Qualification, parity, age of the last child, family history of heart disease and the query whether they attended the infant CPR before and if yes then how many times and whether they are willing to attend any future course on infant CPR. The section 2 contained the questions on the knowledge. There were 5 questions in the knowledge section. All questions were in multiple choice formats. In the knowledge section, score 1 was given to every right answer and 0 to every wrong answer. A higher score indicated better knowledge about episiotomy. Thus the maximum score will be 5 and minimum will 0. The score above the mean score was considered a good knowledge while a score below the mean was considered as poor knowledge. The data were entered and analyzed by using the statistical package for social sciences, version 21 (SPSS, Chicago, IL, USA). Descriptive statistics were presented using counts, proportions (%), mean  $\pm$  standard deviation whenever appropriate. Descriptive statistics (e.g. number, percentage) and analytic statistics using Chi Square tests ( $\chi^2$ ) to test for the association and/or the difference between two categorical variables were applied.

A p-value equal to or less than 0.05 was considered statistically significant. An approval letter from the research committee of the MCH was taken before starting the research. Informed Consent was also taken from each participant of the study.

### 3 Results

A total of 254 out of 284 subjects responded the questionnaires making the response rate of 89%. The mean age of the participants was 38.65 years  $\pm$  Std. Dev. 9.90 years (range 18 years -67 years). The majority of the participants (61.0%) were graduate followed by postgraduate whose parentage was 19.7%. Fifteen percent of the participants were secondary educated while only 4.3% were elementary educated. As far as the parity is unearned the mean parity was 3.15  $\pm$  Std. Dev. 1.74 (Range 0-8). The mean age of the last child of the participants was 6.37 months  $\pm$  Std. Dev. 4.72 months. Almost sixteen percent (15.7%) of the participants had family history of heart disease. Almost twenty seven percent of the participants who took the course of CPR took it one while 73.23% took it twice. Fifty percent of the participants had attended the CPR course. An overwhelming majority of the participants (87.0%) were willing to take a short course of infant CPR if it is available in MCH. The details of the sociodemographic characteristic are shown in table 1.

**Table 1** The sociodemographic Characteristic of the participants

Variables	No.	Percentage
<b>Age: Mean : 38.65 years <math>\pm</math> Std. Dev. 9.90 years ( range 18 years -67 years</b>		
<b>Age group</b>		
18- 27 years	34	13.4
28-37 years	69	27.2
38-47 years	96	37.8
48-56 years	43	16.9
>57 years	12	4.7
<b>Educational qualification</b>		
Primary educated	11	4.3
Secondary educated	38	15.0
Graduate	155	61.0
Postgraduate	50	19.7
<b>Age of the last child 6.37 months <math>\pm</math> Std. Dev. 4.72 months</b>		
<b>Family history of heart disease</b>		
Yes	40	15.7
No	214	84.3
<b>Did you ever attended the CPR course</b>		
Yes	127	50.0
No	127	50.0
<b>If yes how many times (N=127)</b>		
1 time	34	26.77
2 times	93	73.23
<b>Are you willing to take short course of infant CPR if it is available?</b>		
Yes	221	87.0
No	33	13.0

### 3.1 Responses on knowledge questionnaires

On the response that what to do if the infant suddenly collapse, 48.4% of the participants answered that they will transfer the infant to hospital quickly while 29.1% asserted that they will knocking lightly on the foot of the baby and 9.9% were of the view that water should be sprinkled on the infants face. More than twelve percent of the participants (12.6%) did not know as what to do. On the question that how an one know if the infant is breathing or not one more than one fourth of the participants (25.6%) stated that the hand should be put on infant chest and it should be observed whether it rises with breathing while majority of the participants were of the view that the chest should be observed if it's going up and down and to listen and feel the air coming out of the nose and mouth. However, only 1.2% of the participants answered that the candle flame should be brought near the nose of the infant to see if the flame is moving with the breath.

**Table 2** The response on the knowledge questionnaires on CPR

Questionnaires	Number	Percentage
<b>What is your response if your infant suddenly collapses?</b>		
Transfer the infant to hospital quickly	123	48.4
knocking lightly on the foot	74	29.1
Sprinkle a little water on the infant's face	25	9.8
I don't know	32	12.6
<b>How can you know if the infant is breathing or not?</b>		
Put hand over infant's chest and observes if it rises with breathing	65	25.6
Near candle of infant's nose and observes if the flame moving with breathing	3	1.2
Observes his chest if it is going up and down, listen and feel the air coming out of his nose and mouth	178	70.1
I don't know	8	3.1
<b>If you witnessed an infant who suddenly collapse and with no pulse what is the appropriate action?</b>		
Contact the ambulance and open the door then start CPR	199	78.7
Take out the infant from the closed area	19	7.5
Contact ambulance and just wait	18	7.1
I don't know	17	7.1
<b>While doing CPR, what is the rate of (compressions/breaths) for infant?</b>		
30 compressions and two breaths	81	24.0
15 compressions and one breath	45	17.7
10 compressions and two breaths	54	21.3
Idont know	94	37.0
<b>What is the correct way to compress the chest in CPR for the infant?</b>		
Compressing by both hands on the infant's chest	17	6.70
Compressing by one hand on the infant's chest	16	6.30
Compressing by two fingers on the infant's chest	158	62.20
I don't know	63	24.80
<b>You have an infant who has a pulse but does not breathe what is the appropriate action?</b>		
Give him two breaths every minute by mouth	8	3.10
Give him breath every 3 to 4 seconds by mouth	76	29.90
Give him two breaths every 30 seconds by mouth	66	26.0
I don't know	104	41.0

On the question that when the participant witness an infant suddenly collapse and no pulse then what should be the their response, a vast majority of the participants answered that they will call ambulance and open the door and start CPR while 8% of them replied that they will take out the infant from the closed area and 7% of them narrated that they will contact ambulance and just wait .However 8.7% of the participants did not know what to do. When asked about as what should be the rate of compression / breathing in infant while doing the CPR, the response of 24%, 17, 7% and 21.3% of the participants were 30 compression / 2 breadth, 15 compression /1 breath and 10 compression /2 breathe. However 37% of the participants answered as they did not know about this. When asked as what is the correct way of to compress the chest in PR for the infant `majority of the participants (62.2%) answered that it should be compressed by two fingers on the infant’s chest while 6.7% knew that compression should be done by both hands on the infant chest and 8.3% of the participants answered it should be done by one hand on infant’s chest. Rest 24.4% of the participants did not as how to do it .On being asked that if they have infant who had a pulse but did not breathe then what appropriate should be done, the majority answered that they did not know followed by 30% of those who answered that the infant should be given breadth every 3 to 4 seconds by mouth. However 3.1% of the participants told that mouth to mouth breadth should be given every minute and 28% of the participants answered that mouth to mouth breadth should be given every 30 seconds. The details of the response on the knowledge questionnaires are shown in table 2.

### 3.2 Knowledge score and its association with the sociodemographic characteristic

**Table 3** The details of the knowledge score on infant CPR and its association with sociodemographic characteristic

Variable	Good knowledge about infant CPR No. (%)	Poor Knowledge about infant CPR No. (%)	P-Value
<b>Mean score: 2.42 ± Std.Dev.1.33 (Range 0-6).</b>			
Knowledge score on Infant CPR	149(58.7)	105(41.3)	
<b>Age group</b>			
18- 27 years	19(55.58)	5(44.42)	0.633
28-37 years	41(59.42)	28(40.58)	
38-47 years	58(60.41)	38(39.59)	
48-56 years	22(51.16)	21(48.84)	
>57 years	9(75.0)	3(25.0)	
<b>Educational qualification</b>			
Primary educated	4(36.36)	7(63.64)	0.045
Secondary educated	20(52.63)	18(47.37)	
Graduate	99(63.87)	56(36.13)	
Postgraduate	25(50.0)	25(50.0)	
<b>Family history of heart disease</b>			
Yes	20(50.0)	20(50.0)	0.010
No	129(60.28)	85(39.72)	
<b>Did you ever attended the CPR course</b>			
Yes	97(76.37)	30(23.63)	0.000
No	52(40.94)	75(59.06)	
<b>Are you willing to take short course of infant CPR if it is available?</b>			
Yes	126(57.01)	95(42.99)	0.000
No	23(69.69)	10(30.31)	

The mean knowledge score in infant CPR of the participants was  $2.42 \pm \text{Std.Dev.}1.33$  (Range 00-5). More than forty one percent of the participants had poor knowledge regarding Infant CPR while 58.7% had good knowledge. The participants of the age group of 57 years and above were having better knowledge on infant CPR than those with age group of 18-27 years, 28-37 years, 38-47 years and 48-57 years old but it was not statistically significant (75% vs.55.58% vs.59.42 vs.60.41 and vs.51.16,  $P=0.633$ ). As educational qualification increased the percent of good knowledge also increased. The percentage of good knowledge on infant CPR was significantly higher among the graduate participants as compared to elementary educated, secondary school educated and post graduate (64.51% vs.36.36 vs.52.63% vs.50%,  $P=0.045$ ). The participants who did not have the family history of cardiac disease were having significantly good knowledge about infant CPR than those with family history of cardiac disease (60.28% vs.50%,  $P=0.01$ ). Those participants who had attended infant CPR course had significantly higher knowledge score than those who did not attend the infant CPR course (76.37% vs.40.94%,  $P=0.000$ ). Those participants who were not willing to take a short course of infant CPR had significantly better knowledge score on infant CPR as compared to those participants who were willing to join the course on infant CPR (69.69% vs.57.01%,  $P=0.021$ ). The details of the knowledge score on infant CPR and its association with sociodemographic characteristic is shown in table 3.

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#### 4 Discussion

The present study was conducted in a large tertiary maternity and child health center of Al Ahsa district of Saudi Arabia to assess the knowledge of the mothers about the infant CPR and its correct implementation. The study has found that almost forty two percent of the participants did not know as how to do infant CPR, which is better than those found in one Ghana study<sup>[6]</sup> where 98.1% of the female were found to have insufficient knowledge about infant CPR. A South Korean study has shown a higher knowledge level (71.0%) about infant CPR among the women but the participants were mostly related to nursing department.<sup>[7]</sup> However in a similar studies conducted in Saudi Arabia, 84% and 90% of the female participants had poor knowledge about infant's CPR.<sup>[1,4]</sup> But in the present study 50% of the participant had attended previous infant CPR course as compared to Saudi Arabia<sup>[4]</sup> where only 10.6% of the participants attended the CPR course. A poor knowledge of CPR has also been reported from a Pakistani study<sup>[5]</sup> where eighty three percent of the women did not know the correct knowledge about CPR. As educational qualification increased the percent of good knowledge about infant CPR also increased in the present study ( $P=0.045$ ) the same result was found in the Ghana<sup>[6]</sup> ( $P=0.025$ ), South Korean<sup>[7]</sup> and Saudi Arabia<sup>[1]</sup> ( $P=0.007$ ) studies where the participants with higher education had significantly better knowledge of Infant CPR.

The participants who did not have the family history of cardiac disease were having significantly good knowledge about infant CPR than those with family history of cardiac disease ( $P=0.01$ ). However in the other Saudi study, a family history of heart disease and the subject's knowledge was also assessed and found no significance in this aspect.<sup>[1]</sup>

Those participants who had attended infant CPR course had significantly higher knowledge score than those who did not attend the infant CPR course ( $P=0.000$ ). The higher score rate on the knowledge of infant CPR was also noted in the study conducted in Riyadh of Saudi Arabia where the subjects who attended the CPR course (mean score of 3.26, sd:  $\pm 1.56$ ) had a better knowledge about infant CPR than those subjects who didn't attend CPR course (mean score 1.29, sd:  $\pm 1.14$ ) which showed statistical significance ( $p: 0.001$ ).<sup>[1]</sup>

As opposed to China study where only 45.5% of the mothers were willing to participate in CPR study, the present study has found that 87% of the participant's mothers were interested to take a course in Infant CPR.<sup>[8,9]</sup>

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#### 5 Conclusion

The present study has shown a better knowledge among the females regarding infant CPR as compared to other studies conducted in Saudi Arabia. The participants in this study were found very motivated to learn the skills of infant CPR. However there is a need to develop programmes for teaching the infant CPR to the mothers at all level of health care facility attending the MCH, Al Ahsa.

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#### Compliance with ethical standards

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*Disclosure of conflict of interest*

No conflict of interest.

*Statement of ethical approval*

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

*Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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