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Assessment of Nurse's Knowledge about Cardiopulmonary Resuscitation (CPR) in Intensive Care Units and Emergency Department in Basra Teaching Hospital

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Abstract **Original Research Article**

A descriptive cross-sectional design study was conducted at Al-Basra teaching hospital, starting from November 24th, 2019 to January 11th, 2020. The study aims to assess the nurses' knowledge about cardiopulmonary resuscitation (CPR), and to find out the relationship between knowledge of the nurses and their demographic variables (gender, age group, Academic qualification, Years of work experience and formal training). A non-probability (purposive) sample of (40) nurses, those who were working in the coronary care unit, intensive care unit, and emergency units. Data were collected through a questionnaire, and it consists of two parts, Part 1 Included (8) items and Part 2 (40) items. Data collected by means of structured self-report techniques with the subjects. The findings revealed that the majority of nurses had poor knowledge about cardiopulmonary resuscitation. There is a significant association between the nurse's knowledge and academic qualification at p-value 0.05 and there was no significant association between the nurse's knowledge and their gender, age group, Years of work experience, and formal training. The study concluded that the majority of the study sample is female; Most of the study sample has poor knowledge about cardiopulmonary resuscitation. The study recommended programs training about cardiopulmonary resuscitation with a larger sample size to determine the effectiveness of CPR training on nurse's CPR knowledge.

Keywords: assessment, knowledge, nurses, cardiopulmonary resuscitation.

INTRODUCTION

Cardiopulmonary resuscitation (CPR) could be a well-recognized procedure during which chest compressions and artificial ventilation are provided to keep of adequate blood flow to the vital organs and the brain [1]. CPR is a critical component of Basic Life Support and Advanced Life Support. Literature indicates deficiencies in the nurse's CPR skills and knowledge [2]. Nurses are usually the primary to know the necessity for and initiate CPR on patients with cardiac arrest within the hospital setting. CPR has been shown to cut back in-hospital deaths when received from adequately trained health care professionals [3]. The American Heart Association is the leading authority on resuscitation science. Its approved training courses are taught across the world. In a trial to practice evidence-based medicine, The American Heart Association updates are released every 5 years. In 2015 the American Heart Association update for emergency care and CPR focuses on topics involving new significant developments in resuscitation science and is an update to 2010. The American Heart Association Guidelines for CPR and ECC instead of as a whole revision of the guidelines [4]. Cardiac arrest can occur both inside and outside the hospital setting, which necessitates the requirement for early recognition and treatment. It's possible to scale back the high associated rate of mortality with cardiac emergencies by ensuring adequate knowledge and practice of basic life support skills. The American Heart Association has issued initial guidelines for both in and out of hospital management, adult cardiac arrest chain of survival, immediate recognition of cardiac arrest, early activation of emergency medical services, early cardiopulmonary resuscitation, and defibrillation [5]. Knowing how to correctly perform basic life support and therefore the Advanced Life Support is among the most important determining factors of the cardiopulmonary success rates. Therefore, it's critical for nurses to understand and perform basic life support to tackle acute medical

emergencies. Thus improving the knowledge and practice of basic life support among nurses is critical within the final outcome of acute emergency situations. However, because of poor practice and knowledge of health care professionals towards basic life support, deaths that might are prevented even by inexpensive and straightforward procedures occur [6]. The quality of CPR performed by rescuers depends on learners integrating, retaining and applying the cognitive, behavioral and psychomotor skills required to successfully perform resuscitation [7]. It is estimated that sudden cardiac arrest remains the leading reason behind death both in Europe and within the United States. Consistent with global statistics, each year because of sudden cardiac arrest 50 to 100/100,000 citizens die from this cause in the world [8]. Recent American Heart Association guidelines from 2010 and 2015 stressed the importance of high-quality chest compression and define standards for compression rate, depth, recoil, and maximal acceptable time for interruptions. High-quality cardiopulmonary resuscitation is that the "cornerstone of a system of care which will optimize outcomes beyond return of spontaneous circulation [9, 10]".

METHODOLOGY

Design of the Study

A descriptive cross-sectional design study was conducted at Al-Basra teaching hospital, starting from November 24th, 2019 to January 11th, 2020. In order to assess the nurses' knowledge about cardiopulmonary resuscitation.

The Sample of the Study

A non-probability (purposive) sample of (40) nurses, those who were working in the coronary care unit, intensive care unit, and emergency unit at Al-Basra teaching hospital. Questionnaires were designed and constructed by the researchers to measure the knowledge of nurses toward cardiopulmonary resuscitation. In order to construct the questionnaires, the researchers employed an exploratory study when multiple-choice questions were presented to (10) nurses who were selected according to study original criteria. The questionnaires was constructed and composed of two parts.

Part 1: demographic Characteristics: consisted of (8) items, which include gender, age group, academic qualification, years of work experience, Working area, formal training in cardiopulmonary resuscitation, frequency of resuscitation performance on the patient, and Source of information.

Part II: nurses' knowledge about cardiopulmonary resuscitation, the researchers depended on the adult basic life support: American Heart Association [9] guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care and related previous studies to build the questions regarded with the second section of nurses' knowledge, this part contain (40) items (multiple choice questions), these items rated and scored as, (1 for correct) and (0 for incorrect) and these items have a contained as a definition, purposes, indication, contraindication, causes of cardiac arrest, principles of external chest compressions and massage, and fundamentals of advanced resuscitation. The validity of the instrument: The validity of the instrument had been achieved by 8 experts from different scientific branches having at least 10 years of experience in their field of work. Data Collection: The data were collected through the utilization of the developed questionnaires and by means of structured self-report techniques with the subjects. The data collection process has been performed from December 2ed, 2019 until December 6th, 2019. Each questionnaire takes approximately (15-20) minutes to complete the report. Data Analyses: Statistical Package for Social Science (SPSS version 22) was used to analyze the data through descriptive and inferential statistical analyses.

RESULTS

Table-1: Distribution of the study sample by socio-demographic characteristics

Variables	Classification	Frequency	Percentage
Gender	Male	17	42.5
	Female	23	57.5
	Total	**40**	**100**
Age group	20-29 year	27	67.5
	30-39 year	6	15.0
	40 year and above	7	17.5
	Total	**40**	**100.0**
Academic qualification	Nursing school	19	47.5
	Nursing institute	14	35.0
	Bachelors in nursing	7	17.5
	Total	**40**	**100.0**
Years of work experience	1-9 year	26	65.0
	10-19 year	8	20.0
	20 year and above	6	15.0
	Total	**40**	**100.0**

Working area	Intensive care unit	14	35.0
	Coronary care unit	12	30.0
	Emergency department	14	35.0
	Total	**40**	**100.0**
Formal training in cardiopulmonary resuscitation	Yes	24	60.0
	No	16	40.0
	Total	**40**	**100.0**
Frequency of CPR performance on the patient	Daily	15	37.5
	Once in a week	5	12.5
	Once in a month	11	27.5
	Once in a year	1	2.5
	Never	8	20.0
	Total	**40**	**100.0**
Source of information	Social media	24	60.0
	Formal training	16	40.0
	Total	**40**	**100.0**

Table 1: presents that the high percent (57.5%) of the study sample are females, 67.5% of them at age group (20-29) years, 47.5% of them nursing school, 65% years of work experience were arranged between (1-9 year), most of them (60%) have Formal training in cardiopulmonary resuscitation, 37.5% of them daily perform cardiopulmonary resuscitation on the patient, and most of them (60%) were source of information from social media.

Table-2: Total mean of the nurse's knowledge about cardiopulmonary resuscitation

No.	Items	Correct	Incorrect	Mean
1	What is CPR?	28	12	0.70
2	When is CPR performed?	15	25	0.38
3	What is one of the most common causes of cardiac arrest?	18	22	0.45
	Why is CPR important?	17	23	0.43
5	When is the best time to administer CPR?	22	18	0.55
6	What does a cycle of CPR consist of?	22	18	0.55
7	What is the correct sequence of the BLS steps, according to the 2015 AHA guidelines?	14	26	0.35
8	You are the 1st rescuer to arrive at the side of a victim. The very 1st step you take is to?	16	24	0.40
9	In order to protect your safety while providing CPR, you should:	20	20	0.50
10	When the heart stops, the lack of oxygenated blood can cause brain damage in only a few minutes. A person may die within:	9	31	0.23
11	When should you provide CPR?	26	14	0.65
12	At what rate should chest compressions occur?	11	29	0.28
13	During 2 rescuer CPR on an adult how many cycles of CPR do you perform before switching roles?	17	23	0.43
14	How deep should chest compressions be for an adult victim?	16	24	0.40
15	Single rescuers should use a compression-to-ventilation ratio of:	15	25	0.38
16	Where should you place your hand to provide chest compressions to an adult?	13	27	0.33
17	After each compression:	19	21	0.48
18	How should chest compressions be performed on an infant?	20	20	0.50
19	When delivering CPR to an infant, the correct depth of compression is:	13	27	0.33
20	How do you check for responsiveness in an infant?	18	22	0.45
21	In order to assess for a pulse in an adult victim, you would assess the _ for how long?	18	22	0.45
22	How long should you check for breathing while performing CPR?	12	28	0.30
23	Which is the adequate ventilation strategy for an adult with respiratory arrest and pulse frequency of 80 bpm?	10	30	0.25
24	After performing 30 high quality chest compressions on an adult victim, the next step is to?	23	17	0.58
25	Why is complete chest recoil good for CPR?	25	15	0.63
26	You suspect a head and neck injury in a victim who is unresponsive and not breathing. How would you open the airway to give breaths?	20	20	0.50
27	Which of the following statements is incorrect about performing chest compressions?	20	20	0.50
28	during administering compression:	16	24	0.40
29	Which of the following statements is incorrect about performing chest compressions?	16	24	0.40
30	How do you know the victim is receiving adequate breaths during CPR?	25	15	0.63

31	In case of an unresponsive adult, repeat the head tilt/chin lift maneuver and attempt the breath again when the:	15	25	0.38
32	How do you open an unresponsive victim's airway?	14	26	0.35
33	If you do not believe there's a spinal injury, what's the best way to open a patient's airway when they are unresponsive?	19	21	0.48
34	How does an automatic external defibrillator (AED) help a person who is in cardiac arrest?	19	21	0.48
35	Who can use an automated external defibrillator (AED)	15	25	0.38
36	A victim is in cardiac arrest and you go to place the automated external defibrillator (AED) pads on the victim's chest. You notice that the victim is wearing a Nitroglycerin medication patch where you would place an AED pad. What of the statements is NOT true?	11	29	0.28
37	A 14 year old is in cardiac arrest and the automated external defibrillator (AED) arrives on the scene. What type of AED pads will you apply?	17	23	0.43
38	Where should you place the automated external defibrillator (AED) pads when treating an infant for pediatric cardiac arrest?	16	24	0.40
39	Which of the following is NOT correct when performing CPR?	24	16	0.60
40	When should you stop doing CPR on a victim?	25	15	0.63
	Total means			**0.44**

Table 2: represent the total means of nurse's knowledge about cardiopulmonary resuscitation which is at a poor level (0.44)

Table-3: Association between gender, age group, academic qualification, and years of work experience, Formal training and nurse's knowledge about cardiopulmonary resuscitation

Variables		nurse's knowledge			Total	Pearson Chi-Square		
		Poor	Moderate	Good		X^2	df	Sig
Gender	**Male**	9	6	2	17	1.17	2	0.555
		52.9%	35.3%	11.8%	100.0%	7		N.S
	Female	16	5	2	23			
		69.6%	21.7%	8.7%	100.0%			
Total		25	11	4	40			
		62.5%	27.5%	10.0%	100.0%			
Age group	**20-29**	17	6	4	27			
		63.0%	22.2%	14.8%	100.0%	2.92	4	0.571
	30-39	4	2	0	6	4		N.S
		66.7%	33.3%	0.0%	100.0%			
	40 and above	4	3	0	7			
		57.1%	42.9%	0.0%	100.0%			
Total		25	11	4	40			
		62.5%	27.5%	10.0%	100.0%			
Academic qualification	**Nursing school**	15	4	0	19			
		78.9%	21.1%	0.0%	100.0%	25.1	4	0.000
	Nursing institute	10	4	0	14	26		Sig
		71.4%	28.6%	0.0%	100.0%			
	Bachelors in nursing	0	3	4	7			
		0.0%	42.9%	57.1%	100.0%			
Total		25	11	4	40			
		62.5%	27.5%	10.0%	100.0%			
Years of work experience	**1-9 year**	16	6	4	26			
		61.5%	23.1%	15.4%	100.0%	3.81	4	0.432
	10-19 year	6	2	0	8	5		N.S
		75.0%	25.0%	0.0%	100.0%			
	20 year and above	3	3	0	6			
		50.0%	50.0%	0.0%	100.0%			
Total		25	11	4	40			
		62.5%	27.5%	10.0%	100.0%			
Formal training	**No**	17	4	3	24	12.0	6	0.062
		70.8%	16.7%	12.5%	100.0%	07		N.S
	Yes	8	7	1	16			
		50.0%	43.8%	6.3%	100.0%			
Total		25	11	4	40			
		62.5%	27.5%	10.0%	100.0%			

Table 3: presents that there is significant association between the nurse's knowledge and academic qualification at p-value 0.05 and there was no significant association between the nurse's knowledge and their gender, age group, Years of work experience, and Formal training.

DISCUSSION

The finding of the study shows that the majority (57.5%) of the study sample are females. these result agreed with the finding of a study done by [2] which was indicated that majority of nurses were females 65.6%.acording to the age group, the highest percentage (67.5%) were (20-29) years old and lowest percentage (17.5%) were 40 year and above. may be explained by the fact that younger nurses were freshly graduated, more interested and motivated and much active than the older ones in this place of work, This result supported by [3], and their findings indicate that the more of the studied nurses were between (20-30) years old(60%). Concerning academic qualification, most of the study sample was nurses have nursing school degree and accounted for (47.5%). This result disagrees with [11] he found that the majority of the study sample was nurses have Nursing Technical Institute (75.4%). Relative to years of work experience more study samples are (1-9) years and accounted for (65%). This result agrees with [12] that finding indicates that the majority of nurses years of experience (1-10) years (32.8%).related to formal training course most of the study sample (60%) have a formal training course on cardiopulmonary resuscitation and this agrees with the finding of a study done by [8] that showed majority study population has attended training courses. This study result indicates that most nurses in the study sample that apply daily the cardiopulmonary resuscitation on the patient at the percentage (37.5%). This finding disagrees with the result of the study done by [2]; the result shows that (40.6% of) performed CPR did so monthly this may be due common of disease and accident in Iraq more than other countries. and according to the source of information, the present study showed that most of them(60%) were the source of information from social media, and This finding is similar to the result obtained from a study done [13] that showed (48%) of the sample have information from social media. This study represents the total means of nurse's knowledge about cardiopulmonary resuscitation which is at a poor level (0.44) This result was similar to result obtain by [14] to determine the relationship between the nurse's knowledge level and their performance on cardiopulmonary resuscitation in critical and emergency care unit they found that there were 63.3% respondents which all of them had poor knowledge about cardiopulmonary resuscitation. This study showed that there is a significant association between the nurse's knowledge and academic qualification at p-value 0.05 This result agrees with the result of study done by[15] and [16] that showed there was a significant relationship between nurse knowledge scores & level of education p-value = (<0.05). And similar to [17] their finding indicates that there was a significant association between the nurses' knowledge and academic qualification at p-value 0.05. The study indicates that there was the non-significant association between the nurses' knowledge about cardiopulmonary resuscitation procedure and their gender, age group, Years of work experience, and Formal training at p-value 0.05, this result agrees with the result of the study done by [18] that showed that no significant association was found between cardiopulmonary resuscitation knowledge and gender, age, work experience, and advanced.

CONCLUSION

The researchers concluded that majority of the study sample are female, Most of study sample have poor knowledge about cardiopulmonary resuscitation at total mean (0.44). And there is significant association between the nurse's knowledge and academic qualification at p-value 0.05 and there was no significant association between the nurse's knowledge and their gender, age group, Years of work experience, and Formal training.

RECOMMENDATIONS

Based on the result of this study the researchers recommended:

1. Programs training study about cardiopulmonary resuscitation with a larger sample size to determine the effectiveness of CPR training on Nurses CPR knowledge.
2. Applied CPR guidelines update by hospitals to modify nurse's knowledge about cardiopulmonary resuscitation every year.
3. Activation of teaching students of nursing school and nursing institutes to the CPR procedure.

Ethical considerations

Permission has been obtained from the College of Nursing/ university of Basra and Ministry of Health, Health Department of Basra, Training and Human Development Center to Basra teaching hospital, before conducting the study.

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