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Research Paper

Evaluation of nurses' competence in cardiopulmonary resuscitation at Al-Diwaniyah Teaching Hospital

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ABSTRACT

Background: Cardiopulmonary resuscitation (CPR) is an urgent, real life intervention meant to keep cerebral circulation and other vital organs working, by combining chest compressions plus artificial ventilation during a cardiac arrest situation. Having solid nursing knowledge of CPR pathways is basically important for survival results, especially in acute care areas.
Objective: The goal was to look at how well nurses know about cardiac arrest and cardiopulmonary resuscitation, across multiple critical care units in a teaching hospital in Iraq.
Methods: This was a hospital based observational cross sectional study, carried out at Al-Diwaniyah Teaching Hospital, Iraq, from October 15 2023 to March 30 2024. The study used non probability sampling, and 50 nurses were chosen from cardiac care, intensive care, emergency, and pulmonary resuscitation units. Data collection happened through structured questionnaires, and they were interviewer administered, the questionnaire itself was made for this particular study. The tool had two parts: one demographic section with 7 items, and a knowledge section with 25 items. For content checking, validity was confirmed after expert opinion, via a group of 10 specialists who reviewed the instrument.
Results: Most of the nurses who took part showed poor understanding in how to recognize cardiac arrest and how to perform CPR correctly. These knowledge gaps were not significantly linked with gender, age, years of clinical experience, the unit where they worked, prior training, or even how confident they rated their resuscitation skills. That said, there was a statistically noticeable relationship between the level of knowledge, and nurses academic qualification.
Conclusions: CPR knowledge gaps are pretty prevalent among nurses working in critical care units at Al-Diwaniyah Teaching Hospital, and from the data it looks like academic qualification is the lone significant demographic predictor. Overall these results point toward systemic deficiencies in CPR preparedness among frontline nursing staff, like it's not just individual, it's more built into the system sort of thing.

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1. INTRODUCTION

It is risky to experience sudden cardiac arrest. danger to life, prompt action in order to prevent Sudden Cardiac Death, medical intervention is essential [1], [2]. Access to timely and sufficient medical care can rise dramatically Probabilities of surviving (Harmon, 2022). A sudden cardiac arrest is It can be broadly divided into two categories: hospital and non-hospital accidents [3]. Out-of-hospital adult cardiac arrest is thought to occur in 95.9 cases per 100,000 persons per year [4]. A variety of techniques that save lives referred to as CPR (cardiopulmonary rescue). It is employed in contemporary medicine to raise the survival rates of the central nervous system [5]. According to a Great West survey40.7% of people in a Turkish city reside in a high area. According to the educated district, 3.6% of them have performed CPR on bystanders and have handled peripheral cardiopulmonary resuscitation [6]. This demands community. Recognizing the signs of cardiac arrest and knowing when to provide CPR. early identification and treatment of cardiac arrest situations Life [7]. Probabilities of surviving It drops from 7 to 10% in cardiac arrest cases for every minute that CPR is delayed [8]. Additionally, it may reduce the amount of time needed for their hospital stay to end [9]. Identification Heart-lung arrest has an inverse relationship Cardiopulmonary resuscitation takes a long time because of the interval between starting active resuscitation and training the medical personnel who will be caring for the patient. It has been made simple enough for anyone to grasp. is capable of learning, irrespective of prior medical education [4]. This swiftly equips trained medical staff Start this treatment now to save lives [10]. Previous CPR instruction only available to medical professionals. It was later discovered that a large number of these occurrences occurred outside of medical facilities and that early cardiac resuscitation was required for the witness who saw the incidence. As a result, CPR is regarded as a skill that is applicable to everyone [11].

2. RELATED WORK

Rajeswaran and colleagues conducted a study examining the capacity of nurses to sustain their CPR knowledge and abilities in district hospitals in Botswana. The findings of this study demonstrate a notable deficiency in the knowledge and abilities of registered nurses when it comes to performing CPR at three local hospitals. The nurses' mean pre-test knowledge score of 48% suggested a significant lack of familiarity with the bulk of basic life support (BLS) activities. Following a duration of 6 months, a collective sum of 85 nurses actively engaged in the process of reassessment screening. The direct post-test score had a substantial increase of 26.4% in comparison to the pre-test. Nevertheless, the performance of individuals who participated in the follow-up assessment 6 months later shown a 14.5% decrease. Conclusion: Insufficient skill and expertise in cardiopulmonary resuscitation (CPR) among registered nurses can impede their capacity to rescue and administer adequate care to those undergoing cardiac arrest. [12] Suggests that employers and nursing professional bodies in Botswana should promote and oversee frequent CPR refresher training. A study was conducted by Ahmed and colleagues to assess the proficiency of nurses in cardiopulmonary resuscitation (CPR) and examine the correlation between their knowledge

and demographic factors such as gender, age group, academic qualifications, years of work experience, and formal training. The findings indicated that a significant proportion of nurses demonstrated inadequate comprehension of cardiopulmonary resuscitation. There is a strong correlation between the nurse's knowledge and academic degrees, as evidenced by the p value of 0.05. Nevertheless, there is no discernible association between a nurse's expertise and their gender, age bracket, years of professional experience, or formal education. In conclusion, the researcher determined that the majority of the participants in the study were female. Furthermore, a significant proportion of the study participants demonstrated a restricted comprehension of CPR, as shown by an average score of 0.44.and the recommendation includes Carry out a study on cardiopulmonary resuscitation (CPR) training programs utilizing a more extensive sample size in order to accurately assess the influence of CPR training on nurses' comprehension of CPR. Key concepts: evaluation, expertise, healthcare professionals, cardiopulmonary resuscitation [13].

3. METHODOLOGY

- **Design of the Study:** A cross-sectional study with a descriptive design was done at AL-Diwaniyah Teaching Hospital from October 15, 2023, to March 30, 2024. To evaluate the nurses' understanding of cardiopulmonary resuscitation.
- **Setting of the Study:** The present investigation was carried out at the AL-Diwaniyah Teaching Hospital in the city of AL-Diwaniyah.
- **The Sample of the Study:** A purposive sample of 50 nurses working in the coronary care unit, which includes the intensive care unit, emergency unit, and respiratory care unit, at AL-Diwaniyah Teaching Hospital.
- **The Study Instrument:** The researcher developed and prepared questionnaires to assess the level of knowledge that nurses possess regarding cardiopulmonary resuscitation. The researcher utilized an exploratory study approach to develop the questionnaires. Open-ended questions were administered to a sample of 50 nurses, who were selected based on specific criteria outlined in the study. The questionnaires were designed and included of three sections. The first portion, Demographic Characteristics, comprised seven items: gender, age, academic achievement, years of work experience, present place of work, and whether the individual has received any training course on CPR. Do you administer cardiopulmonary resuscitation (CPR) to the patient? The section on nurses' understanding of cardiopulmonary resuscitation included of 11 questions pertaining to anatomy and physiology, as well as 14 questions related to cardiac arrest and cardiopulmonary resuscitation.
- **Method of Data Collection:** The data were gathered using the prepared questionnaires and a structured self-report technique with the participants. Data collection occurred between December 7th, 2023 and January 7th, 2024. Each subject allocates an average of 15 to 20 minutes.
- **Reliability of the Questionnaire:** The internal consistency of the questionnaire was assessed by calculating the Cronbach's alpha score, which is a measure of reliability. The range of values obtained was between 0.7 and 0.9. The estimated findings indicate that the internal consistency, as measured by Cronbach's Alpha, scored 0.812. The data acquired from the questionnaire study demonstrated a good internal consistency of replies. This indicates that the designed questionnaire is valid for studying the phenomenon in the same population at any future time.
- **Data Analysis:** The data was analysed using SPSS Version 25. Two distinct methodologies are employed for data analysis, namely descriptive analysis, which includes frequency and percentage calculations, and inferential analysis, namely the Chi-square test of independence.

4. RESULTS AND DISCUSSION

Table 1. The Demographic Characteristics of the Participants

Demographic Characteristics		Frequency	Percent
Age	18- 22	6	12.0

	23 - 28	38	76.0
	29 - 34	3	6.0
	35 - 40	1	2.0
	41 and more	2	4.0
	Total	50	100.0
	Mean ± SD	26.34 ± 4.35	
Gender	Male	19	38.0
	Female	31	62.0
	Total	50	100.0
Level of Education	High school of Nursing	2	4.0
	institute of Nursing	21	42.0
	College of Nursing	24	48.0
	High study in Nursing	3	6.0
	Total	50	100.0
Experience years	One year or less	16	32.0
	2 – 5 years	27	54.0
	6- 10 year	4	8.0
	11.00 year and more	3	6.0
	Mean ± SD	3.66 ± 4.4	
Working place	CCU	19	38.0
	ICU	11	22.0
	Emergency department	12	24.0
	RCU	5	10.0
	Another department	3	6.0
	Total	50	100.0
CPR training course	No	35	70.0
	Yes	15	30.0
	Total	50	100.0
Practice CPR for the patient	Daily	9	18.0
	Weekly	20	40.0
	Monthly	13	26.0
	Annually	8	16.0
	Total	50	100.0

This Table 1 shows the demographic characteristics of the participants. The nurses aged 23 to 28 years had the highest percentage (76%), while the lowest was between 35 and 40 years. Females were 62%. Nursing with a bachelor's degree appeared in 48% of them, compared with those who had a high school degree in 4%. There were a lot of them working in the cardiac care unit (CCU), and they not have any training course about CPR with 70% of them.

Table 2. The Overall Level of Knowledge of Participants

No.	**Questions**	**False Answers**		**True Answers**	
	Heart Anatomy and Physiology	F	%	F	%
1.	The heart is a hollow muscular organ located in…	12	24	38	76
2.	The weight and size of the heart are affected by…	48	96	2	4
3.	The heart pumps blood to the tissues, to provide them with?	28	56	22	44

4.	How many layers make up the heart?	23	46	27	54
5.	Right side of the heart….?	20	40	30	60
6.	Left side of the heart….?	29	58	21	42
7.	Heart valves allow blood to flow in one direction...?	19	38	31	62
8.	Cardiac output is…?	35	70	15	30
9.	The amount of blood expelled from the heart during each beat...?	48	96	2	4
10.	Where is the respiratory center located?	32	64	18	36
11.	Lungs is……?	24	48	26	52
CPR and heart attack		f	%	f	%
12.	Which of the following medical conditions would lead to CPR?	10	20	40	80
13.	What are the most common complications for a patient undergoing CPR?	34	68	16	32
14.	Which of the following interventions has a significant impact on improving survival during sudden cardiac arrest?	47	94	3	6
15.	What is the most likely cause of cardiac arrest after myocardial infarction?	40	80	10	20
16.	A patient who has a cardiac arrest should have the following signs?	31	62	19	38
17.	The first organ in the human body affected by lack of oxygen is?	30	60	20	40
18.	Cardiac arrest occurs…?	30	60	20	40
19.	How long can the brain survive without oxygen?	41	82	9	18
20.	The first and necessary step in treating a cardiac arrest is immediate recognition. The paramedic should.	8	16	42	84
21.	When assessing the pulse of an unconscious patient, which of the following is the best artery to check the pulse?	16	32	34	68
22.	How often should an emergency vehicle be checked in the lobby or anywhere in a hospital?	37	74	13	26
23.	What is the first medication given in cases of cardiac arrest?	13	26	37	74
24.	What does the abbreviation CPR mean to you?	6	12	44	88
25.	(Survival of chain the) means…?	21	42	29	58

Table 3. Shows the Overall Level of Knowledge of the Participants

		Frequency	**Percent**
Knowledge	Low	9	18.0
	Fair	41	82.0
	Good	0	0

This Table 3 shows the overall level of knowledge of the participants. The greatest percentage had a fair level of knowledge, while there isn't anyone who has good knowledge.

Table 4. The Relationship Between Demographic Variables and Overall, Knowledge

Demographic Variables	Chi-Square Test Value	Df	P-Value	Sig.
Age	1.148	4	.887	N.S.
Gender	.101	1	1.000	N.S.
Level of Education	2.373	3	.499	N.S.
Experience years	10.777	3	.013	Sig.
Working place	1.371	4	.849	N.S.
CPR training course	4.704	1	.043	Sig.
Practice CPR for the patient	2.965	3	.397	N.S.

This Table 4 shows the relationship between demographic variables and overall knowledge. "Experience year" and "CPR training courses" had a significant relationship between them and overall knowledge because their p-value was greater than the significant 0.05. Other variables didn't have a relationship because their p-values were greater than 0.05.

4.1. Discussion

Part 1: Examining the Demographic Factors Associated with Nursing Knowledge The study's findings, which indicate that 62% of nurses were female, are corroborated by [14] research, which also indicated that most nurses were female. The age group of nurses with the biggest proportion (76%) consisted of individuals aged 23 to 28. The age group with the lowest prevalence (2%) was comprised of those aged 35 to 40. This can be attributed to the younger nurses recently graduating, since they tend to be more driven, engaged, and active compared to their older counterparts in the region. This result is similar to the one obtained by [15]. The study's findings suggest that a substantial percentage of the surveyed nurses were between the age bracket of 23 to 28. Regarding educational achievement, 48% of the participants in the survey, who were nurses, possessed a bachelor's degree from a nursing college. This outcome concurs with [16] discovery that the majority of study participants were bachelor's degree-holding nurses. The study sample included nurses with a diploma from an institute of nursing, and their percentage was higher than that of nurses with other education levels. However, it was still less than the 42% of nurses who had bachelor's degrees. More studies, or 54% of all studies, had between two and five years of work experience. This result bears a striking resemblance to, and [16]. According to their findings, the majority of nurses had less than five years of experience. A higher percentage of study samples (38%) from the cardiac care unit (CCU) are shown in the working workplace. [17] Demonstrates that a greater the percentage pertained to nurses who did not partake in training courses. Regarding the sample used in the study, the majority (70%) had not attended any cardiopulmonary resuscitation training classes. According to the current study, 40% of nurses who perform weekly cardiopulmonary resuscitation on patients are accounted for. Compared to individuals who perform cardiopulmonary resuscitation on a daily and monthly basis, their percentage is higher. This conclusion conflicts with that of study, which found that 22.4% of nurses were unable to perform (CPR).

Part 2: Examination of the ultimate evaluation nurses' proficiency in CPR: The examination of the nurse's knowledge related cardiac arrest and cardiopulmonary resuscitation yielded a moderate level of knowledge. The findings of this study were consistent with those of, who conducted a similar assessment of nurses' knowledge of CPR at Al-Najef Teaching Hospital. Both studies revealed a low level of understanding among the nurses. At Al-Diwaniyah Teaching City Hospital, there is a lack of nurses that possess proficient knowledge in CPR. This outcome paralleled the investigation conducted on house officers, which examined their acquisition of teaching knowledge, perceptions Regarding the proficiency in performing CPR, it encompasses a range of abilities and the individual's level of self-assurance. The study conducted by [18] investigated the perceived competence. of healthcare professionals in Kuwait in terms of their knowledge and practice of cardiopulmonary resuscitation (CPR). However, both studies concluded that nurses' knowledge of cardiac arrest and CPR procedures is inadequate.

Part 3: Examination of the relationship between general evaluation expertise and demographic factors: The study found There is no discernible association between the nurse's understanding of

Cardiopulmonary resuscitation (CPR) protocols and their age., with a p-value of 0.05. This finding is consistent with previous research by [19] likewise found no significant association between the nurse's knowledge and their age. The study found no statistically significant correlation between the nurse's knowledge ratings regarding cardiopulmonary resuscitation and their gender, as indicated by a p-value of 0.05. The research conducted by [20] provides evidence that there is no substantial link between a nurse's proficiency in cardiopulmonary resuscitation and their gender. No statistically significant link was observed between the nurse's CPR knowledge and their level of education at the specified p-value. This discovery presents a contradiction to the findings of research, which established a There is a strong correlation between nurses' understanding of cardiopulmonary resuscitation and their amount of education. An evident correlation was observed between the nurse's proficiency in cardiopulmonary resuscitation and their duration of professional experience., with a p-value of 0.05. confirmed this discovery by demonstrating a significant association between nurses' understanding of cardiopulmonary resuscitation and their duration of work experience. The study found no significant correlation between the nurse's understanding of cardiopulmonary resuscitation (CPR) and their workplace or their application of CPR for the patient, as indicated by a p-value of 0.05. This discovery was confirmed by. Their findings the data suggests that there was no significant correlation between the nurses' understanding of cardiopulmonary resuscitation and their job environment or their execution of cardiopulmonary resuscitation on patients. An evident link was established between the nurse's understanding of cardiopulmonary resuscitation and their training course, as evidenced by a p-value of 0.05. This discovery is in direct opposition to the findings of. Their findings indicate that there is no substantial association between the level of cardiopulmonary resuscitation knowledge among nurses and the specific training program they have completed.

5. CONCLUSION

- More of the studied nurses have bachelor's academic qualifications and diplomas, However, the percentage of nurses who hold a diploma is less than the percentage of bachelor's degrees.
- The majority of the samples lack training courses in cardiopulmonary resuscitation.
- The majority of study nurses provide CPR to their patients on a weekly basis.
- The majority of the study nurses possess a moderate level of understanding in cardiopulmonary resuscitation.
- The referral institutions should provide procedure manuals that contain comprehensive information regarding the latest advancements, discoveries, and practices in CPR. An annual audit should be conducted on the procedure handbook, and immediate action should be taken to address any detected problems.
- Implementation of CPR training for nursing students in nursing colleges and institutes.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Haider Kadhum Raddam	✓	✓	✓	✓		✓		✓	✓	✓	✓			
Alaa Ebrahim Saeed	✓	✓	✓			✓	✓	✓		✓	✓	✓		

C : **C**onceptualization I : **I**nvestigation Vi : **Vi**sualization

M : **M**ethodology	R : **R**esources	Su : **Su**pervision
So : **So**ftware	D : **D**ata Curation	P : **P**roject administration
Va : **Va**lidation	O : Writing - **O**riginal Draft	Fu : **Fu**nding acquisition
Fo : **Fo**rmal analysis	E : Writing - Review & **E**diting	

Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Not Applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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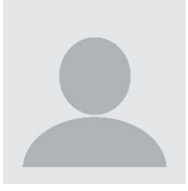	**Alaa Ebrahim Saeed,** is a faculty member in the Adult Nursing Department at the College of Nursing, University of Al-Qadisiyah, Iraq. She is dedicated to advancing nursing education and clinical practice in the field of adult care. Her academic contributions focus on enhancing the knowledge and professional competencies of nursing students, reflecting a strong commitment to improving healthcare standards and nursing practice within the Iraqi academic and healthcare community.