

Electrocardiography Knowledge among Cardiac Care Unit Nurses at Al-Salam Teaching Hospital

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ABSTRACT

Heart disease was responsible for approximately 32% of all deaths. Early diagnosis and detection of cardiac disorder plays a crucial role in reducing mortality rates. The electrocardiogram (ECG) is a widely used diagnostic technique that records the electrical and muscles activity of the heart. The study aims to evaluate the cardiac care unit nurses in knowledge and competency of interpreting electrocardiography. Descriptive design was applied to achieve the objectives of the present study for the period of (1/12/2024) throughout (1/6/2025). The sample of the study consisted from (100) nurse who are include in the study by using random sampling technique, the study was conducted in the Al- Salam Teaching Hospital in Mosul City. Data were collected by used standarized questionnaire form. Statistical Package for the Social Science (SPSS, version 21) is used for data analysis. The results show that inconsistent ECG knowledge among nurses, with significant differences in some items ($p \leq 0.001$) and no significant differences in others. The results show the lack of consistency on the level of electrocardiography (ECG) knowledge among nurses, and important gaps still exist in a number of critical areas of ECG interpretation. And the study recommended introduce nurses in cardiac care units to regular, planned ECG education.

Keywords: *Electrocardiography, Cardiac Care Units.*

INTRODUCTION

In 2022, cardiovascular disease (CVD) was responsible for approximately 32% of all deaths. Early detection of heart disease plays a crucial role in reducing mortality rates. The electrocardiogram is a widely used diagnostic technique that records the electrical and muscles activity of the heart. It is most commonly investigation performed in cases of chest pain, allowing healthcare professionals to evaluate symptoms and potential risks. ECG findings are essential for identifying arrhythmias and acute coronary syndromes. Thus, Electrocardiography recording is necessary in all the departments of the hospital to aid in proper diagnosis of cardiac diseases. Electrocardiogram is regarded as one of the most widely used diagnostic devices in cardiovascular practice¹. Electrocardiogram is consider one of the most widely used diagnostic tools in the heart diseases and is claimed to be standard choice of arrhythmia in emergency department, chest pain, acute coronary syndrome, pneumothorax, and other disorders that involve monitoring and analysis of the electrical activity of the heart and plotting it². The likelihood of sensing the electrical conduction of the cardiac is influenced by number factors and these include: the characteristics of the dermal and epidermal skin layer, the properties of the electrolytic paste, the characteristics of the electrodes and how they interact with the skin in a mechanical manner Nurses in emergency rooms (ER) are highly involved in the prompt diagnostic and management of patients with a cardiac problem in cardiac care units³. An electrocardiogram, ECG competency is valued because it is one of the most prevalent tools used to act this purpose, and it is also regarded as an important step in the primary care at emergency department patients⁴. Cardiac emergencies Nurses must be capable of interpreting ECGs because of their n fact, the very specific needs of hospital nurses regarding their delivery of health education and factors affecting their provision of such education have not been evaluated fully to date Heartbeat information (as an electrocardiogram (ECG)) is a fairly common method used by

physicians to diagnose a wide variety of health conditions and diseases including arrhythmia, coronary artery disease, Enhanced competency experience related intensive care unit staff may enhance patient safety by reducing the risk of misinterpretation in cases with life-threatening conditions⁵. Nurses play important role in obtaining, interpreting and communicating ECG findings which knowledge and skills in detecting any arrhythmia are key factors in determining the quality of nursing care⁶. Nurses must have sufficient knowledge to perform these responsibilities in ways that increase care and patient outcomes⁷.

METHODOLOGY

Before data was really collected, a formal administrative approval was received. Ninevah health directorate, Department of Health in Nineveh. Descriptive design was applied a formal administrative approval was secured before the actual gathering of data. (1/12/2024) throughout (1/6/2025). The sample of the study consisted from (100) nurse who are include in the study by using random sampling technique. The study was conducted in cardiac care unit at Al- Salam Teaching Hospital in Mosul City. The questionnaire form was standardized to be used in this study or measures the phenomenon under investigation. It has become increasingly common, Panel of experts in the content area to evaluate and document the Validity of the Instrument was established through a panel of (10) experts of different specialties related to the field of the present study because some items translated to language to facilitate for nurses who participate of the study, Data are prepare, organize and entering in a computer; Statistical Package for the Social Science (SPSS, version 21) is used for data analysis.

RESULTS AND DISCUSSION

The results of the research showed that the demographic characteristics of the study, showed that 25% (25) of the sample at (30-34) years of age,

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56% (56) of the sample are male gender, 39% (39) of the sample work in Emergency department, 42% have institution certificate of nursing, as well as 29% (29) have less than 5 expert years (Table 1).

On the other hand, using the Chi-Square statistical test, the study found that only the variables of age, Level of education, the number of years of experience, get Training, and take Workshop have a significant impact and statistical differences in answering the questionnaire questions. These results of study are contradicted to another study in age and experience, no statistically significant differences in average ages or experience levels of samples⁸⁻¹² (Table 2). Similar results were found in other studies regarding college certification (Bachelor's degrees)¹³.

The findings of other studies on nurses' knowledge and training are inconsistent¹⁴. This study found non-significant between a nurse's gender and their knowledge. These results contrast with another study¹⁵⁻¹⁸. The results of the current study contradict with those of another study conducted in the workplace. The previous study was carried out in the cardiac care unit, cardiac care unit, emergency department, cardiac office, where knowledge and understanding of ECG are particularly important¹⁹⁻²². The study shows that only (21%) of nurses answered correctly to Question1 while (49%) answered correctly to Question2 and only 37 nurses (53%) answered correctly to Question 3 (Table 2). Few of nurses 34 (34%) answered correctly to Question4, On the other hand, we found that the most correctly answered question is Question 23 (Can an electrocardiogram (ECG) determine the location of arterial blockage), with a percentage of 83%. Statistically, there is significant difference between answers to the questions when analyzed by Chi-

square. Where we found that there are fourteen out of 25 questions in this domain that had a high significant and effective response, i.e. there is a significant statistical effect at the level of 0.05. In order to find out the total number of nurses who answered correctly to more than 12 questions (50%) of the questions, we conducted a level score test, where the low-level score was given to nurses who answered from (1-12) questions (<50%) of the total questions and the high-level score of nurses who answered (13-25) questions with a correct answer (Table 3).

Similarly, the finding evaluated for the nurse's knowledge about electrocardiography, the majority of the nurses (78.3%) providing not correct answers related the questionnaire items, which were unsatisfying²³⁻²⁶. The number of nurses who obtained a low level of knowledge about the subject are 65(65%), while the number of nurses who obtained a high level of knowledge are 35 (35%) of the total number of nurses who answering the questionnaire. We conclude from this that the nurses of Ibn-Sina teaching hospital have bad knowledge about the subject of regarding electrocardiography. However, these findings similar with the results of other studies such as that of according to which their participants showed a lack of knowledge about electrocardiography²⁷⁻³¹. The study concluded that there exist inconsistent levels of electrocardiography knowledge for nurses, there are major gaps of ECG interpretation in various areas of ECG. These finding imply the existing knowledge cannot guarantee optimum clinical decision making in cardiac care facilities. Recommended this study introduce nurses operating in cardiac care units to regular and formal ECG training programs. Promote life-long learning by taking refresher courses and evidence-based guidelines.

Table 1. The Demographic Characteristics of the Sample in the Study

Demographic	Items	Freq.	%	χ^2	Sig.
Age	(20-24) years	8	8.00%	19.28	0.004 (S)
	(25-29) years	23	23.00%		
	(30-34) years	25	25.00%		
	(35-39) years	11	11.00%		
	(40-44) years	11	11.00%		
	(45-49) years	10	10.00%		
	More than 50 years	12	12.00%		
Gender	Male	56	56.00%	1.44	0.230 (NS)
	Female	44	44.00%		
Work Place	Emergency Department	39	39.00%	2.66	0.264 (NS)
	Medical ward	26	26.00%		
	CCU	35	35.00%		
Level of Education	College	40	40.00%	10.64	.0005 (S)
	Institution	42	42.00%		
	School	18	18.00%		
Number of expert years	less than 5	29	29.00%	28.64	0.000 (S)
	(6-10)	25	25.00%		
	(11-15)	19	19.00%		
	(16-20)	12	12.00%		
	(21-25)	2	2.00%		
	more than 25	13	13.00%		
Have you received formal training on interpreting ECG readings?	Yes	34	34.00%	10.24	0.001(S)
	No	66	66.00%		
Have you attended a workshop on ECG	Yes	26	26.00%	23.04	0(S)
	No	74	74.00%		
Total		100	100%		

Freq. = Frequency, %= percentage, χ^2 = Chi-square test, Sig.= Significance, NS: Non-Sig. at $P>0.05$

Table 2. Descriptive association between questions related to General knowledge of nurses in the field of regarding electrocardiography

Domains	Questions	Freq.				Cum. %	C.S.	P-value of Chi- Square test.
		TRUE	%	FALSE	%			
knowledge of nurses regarding electrocardiography	I can read ECG Results and extract basic information.	21	21	79	79	100%	H. S	<.001
	I can identify myocardial infarction signs through ECG.	49	49	51	51	100%	N. S	0.841
	I can distinguish between ventricular and atrial tachycardia.	53	53	47	47	100%	N. S	0.549
	Certain electrolyte disorders (potassium deficiency) may seriously influence ECG values and must be considered when examining the results.	34	34	66	66	100%	H. S	0.001
	upon to determine the need for urgent cardiac catheterization.	45	45	55	55	100%	N. S	0.317
	Incorrect body Positioning can potentially distort ECG results.	15	15	85	85	100%	H. S	<.001
	ECG is the first choice in emergency department.	34	34	66	66	100%	H. S	0.001
	ECG can detect a previous heart attack.	47	47	53	53	100%	N. S	0.549
	ECG can detect Ischemia (reduced blood flow).	48	48	52	52	100%	N. S	0.689
	Abnormal ECG readings always indicate a cardiac condition.	42	42	58	58	100%	N. S	0.11
	ECG is useful in diagnosing congenital heart defects.	44	44	56	56	100%	N. S	0.23
	I can interpret the QRS wave in an ECG.	58	58	42	42	100%	N. S	0.11
	I can identify the P wave in an ECG.	34	34	66	66	100%	H. S	0.001
	I can interpret the QR interval in an ECG.	65	65	35	35	100%	H. S	0.003
	ECG can determine the location of arterial blockage.	63	63	37	37	100%	H. S	0.009
	ECG can detect electrolyte imbalances in the body.	67	67	33	33	100%	H. S	<.001
	ECG always accurately diagnoses heart diseases.	53	53	47	47	100%	N. S	0.549
	Did you know that							
	ECG can detect the effects of drugs such as digoxin on the heart?	57	57	43	43	100%	N. S	0.162
	Athletes can use ECG to assess their heart health.	16	16	84	84	100%	H. S	<.001
	ECG requires special Preparations before conducting it.	21	21	79	79	100%	H. S	<.001
	ECG is essential for those with symptoms such as shortness of breath.	32	32	68	68	100%	H. S	<.001
	The main purpose of ECG is to evaluate the electrical activity of the heart.	14	14	86	86	100%	H. S	<.001
	Can an electrocardiogram (ECG) determines the location of arterial blockage?	83	83	17	17	100%	H. S	<.001
	Is the duration of QRS wave (less than 0.12 seconds) normal?	62	62	38	38	100%	S	0.016
	Does the sinoatrial node (SA node) function as the natural the pacemaker of the heart?	71	71	29	29	100%	H. S	<.001

Freq.=Frequencies, %=Percentages, Cum. = cumulative percent, C.S.: Comparison Significant, χ^2 - test=Chi-Square test. , P=P-value, NS : Non-Significant at P>0.05.

Table 3. Descriptive Score level test

Valid	Frequency	Percent
Low score	65	65.00%
High score	35	35.00%
Total	100	100%

CONCLUSION

The study concluded that the show the lack of consistency on the level of electrocardiography(ECG) knowledge among nurses, and important gaps still exist in a number of critical areas of ECG interpretation. And the study recommended introduce nurses in cardiac care units to regular, planned ECG education.

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Competing Interest: None

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