



Applied Research and Innovation (ARI)

ISSN: 2993-8988 (ONLINE)

VOLUME 3 ISSUE 1 (2025)

PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Effect of Knowledge on Interpretation of ECG on the Treatment of Patients with ACS (Acute coronary syndrome): Literature Review

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Article Information

Received: June 25, 2024

Accepted: August 08, 2024

Published: April 24, 2025

Keywords

*Ecg Interpretation, Knowledge,
Nurses*

ABSTRACT

Background: Knowledge to analyse ECG abnormalities in nurses needs to be identified to determine their level of understanding in determining appropriate actions, because correct ECG interpretation is one of the first steps to reduce mortality in patients with heart disease. The purpose of this study was to determine the influence between nurses' knowledge in ECG interpretation on the handling of patients with heart disease. Methods: This study uses a literature review method taken from google scholar, pubmed and scopus published from 2018-2023 Then select, analyse, and review several sources. Results: knowledge affects the results of ekg interpretation, besides knowledge there are also other factors. Such as experience, attitude, and skills. Conclusion: the better the knowledge of a nurse, the better it will be in interpreting ekg. Suggestion: in addition to increasing the knowledge of nurses, it would be nice after conducting EKG training to be immediately applied and continue to hone their skills.

INTRODUCTION

Coronary heart disease is one of the highest causes of death with more than 7.4 million deaths each year (WHO, 2017). Data from the Global Burden of Cardiovascular Diseases (2020) states that there are 271 million cardiovascular disease events since 1990 and continues to increase every year. Based on Basic Health Research data (Risksedas, 2018), the incidence of heart and blood vessel disease is increasing from year to year. The mortality rate caused by CHD in Indonesia is quite high, reaching 1.25 million people if the Indonesian population is 250 million (Kemenkes, 2020). Indonesia, the results of the 2019 Basic Health Research showed that 1.5% or 15 out of 1,000 Indonesians suffered from coronary heart disease. The increasing incidence of heart disease requires supporting examinations that can help establish a diagnosis quickly and accurately, so as to provide the correct treatment and treatment process according to the patient's condition. Electrocardiography (ECG) is a diagnostic tool that is practical, simple, accurate and the results can be read immediately and almost all abnormalities and emergencies in the cardiovascular field can be detected by electrocardiography (ECG), so that as much as possible all health workers, including general practitioners, nurses, and even nursing students must be able to master electrocardiography (ECG) (Dharma, 2010).

A nurse is someone who has the knowledge, skills and authority to provide nursing care to others based on the knowledge and tips they have within the limits of their authority. (PPNI, 1999; Chitty, 1997). Including one of them is the competence of placing electrodes and monitoring electrocardiography (ECG). One of

the actions taken in ECG examination is recording and interpreting ECG results and reporting the results of ECG interpretation if there are morphological changes or abnormalities recorded on ECG paper to the doctor. This must be done immediately so that appropriate treatment and medication can be given, as well as evaluating the effectiveness of the treatment. Through the examination of electrocardiography (ECG) recordings carried out by nurses to patients admitted to the hospital will help nurses in detecting cardiac function emergencies in patients and establishing patient nursing diagnoses and determining appropriate nursing action plans, so as to improve cardiac care services and help improve the quality of life of patients with heart disease. However, in reality, not all nurses have the same competence in interpreting ECGs, many nurses are only able to examine electrocardiographic (ECG) records but are unable to interpret ECGs (McGrath & Sampson, 2018).

The inability of nurses to interpret the ECG will affect the response time in handling cardiac function emergencies. The slower the response time in serving patients in the hospital, the worse the patient's illness will be. Therefore, competence in ECG interpretation is very important to be possessed by a nurse, especially in the emergency room, ICU and ICCU because nurses are the first health professionals to assess patients and perform ECG recording including its interpretation.

MATERIALS AND METHODS

This research uses a literature review method taken from google scholar, pubmed and scopus published from 2018-2023 Then select, analyse, and review several sources.

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Table 1:

No	Title	Author	Destination	Method	Results
1	Differences in nurses' knowledge in interpreting Electro Cardio Graphics (ECG) in the Emergency Department (ED) and Intensive Care Unit (ICU) of Muhammadiyah Lamongan Hospital.	Isni Lailatul Maghfiroh and Muhammad Rizal. Year 2022	The purpose of this study was to determine the differences in nurses' knowledge in interpreting ECG in the Emergency Department and ICU of Lamongan Muhammadiyah Hospital.	This research method is a comparative study research with a cross sectional approach. The research sample was taken with total sampling technique, which involved all emergency room and ICU nurses at Muhammadiyah Lamongan Hospital, with a total of 45 nurses.	The results showed that although there was no significant difference in knowledge between ED and ICU nurses, ICU nurses had a better mean score. However, nurses' knowledge in ECG interpretation still needs to be improved.
2	Cardiovascular Emergency Management Education: ECG Interpretation To Nurses at Grestelina Hospital Makassar	Suradi efendi, arman, nour sriyanah, Halmina Ilyas year 2023	To improve nurses' knowledge on ECG interpretation and cardiovascular emergency management.	Lecture method, where materials were presented to participants to explain education on cardiovascular emergency management, particularly ECG interpretation.	With the counselling activities, there was a significant improvement in nurses' knowledge, as indicated by an increase in the number of nurses with good knowledge. This demonstrates the effectiveness of counselling activities in improving nurses' understanding of ECG interpretation and cardiovascular emergency management.
3	Factors affecting competence in ECG interpretation among nursing students	Rosdiana; Devi Darliana; Anda Kamal Year 2022	Identify factors that influence student competence in interpreting the ECG.	This type of research is descriptive exploratory with univariate analysis on active nursing science students of Syiah Kuala University. Sampling method with technique total sampling of 150 students.	Factors affecting competence in ECG interpretation are: beliefs and values, skills, experience, personal characteristics, motivation, emotional issues and intellectual capacity
4	Electrocardiogram interpretation competency among emergency nurses and emergency medical services (EMS) personnel	Maryam Rahimpour, Shahla Shahbazi, Mansour Ghafourifard, Neda Gilani, Cathal Breen	Compare electrocardiogram (ECG) interpretation competency Among emergency nurses and EMS personnel.	Cross-sectional and comparative descriptive study	Hospital emergency nurses were more qualified to interpret the ECG than the pre-hospital emergency medical personnel

5	Electrocardiographic interpretation by emergency medical services professionals in Saudi Arabia	Mohammed Abdullah Alalwan, Ahmed Alsaleh, Talal Alshammari, Hassan Alawjan, Hassan Alkhayat, Ahmad Alrawashdeh, Ibrahim Alamri, Alaa Aldubaikel, Jaber AlqahtaniID	Assess the ECG competency of EMS providers in Saudi Arabia	All EMS providers working for the Saudi Red Crescent Authority in Makkah, Riyadh, and Sharqiyah regions to complete a cross-sectional survey.	The study found that emergency medical service providers in Saudi Arabia had a 43.3% electrocardiographic interpretation (ECG) competency rate. Paramedics with higher qualifications had a 40.2% better ECG interpretation proficiency level compared to those with lower qualifications.
6	Life threatening arrhythmias: Knowledge and skills among nurses working in critical care settings at Muhimbili National Hospital, Dar es Salaam, Tanzania.	Dinnah I. Ruhwanya , Edith A.M. Tarimo and Menti Ndile	Assess the knowledge and skills of nurses in identifying life threatening arrhythmias and the required patient care.	A descriptive cross-sectional study	The result of the study is that nurses have been able to identify arrhythmias but have not been able to handle them.
7	Overview of Nurses' Ability to Interpret ECG in Detecting Cardiac function emergencies in hospitalised patients Labuang Baji Makassar	Nusdin Nusdin, Ahmad Indra Awaluddin (2023)	To determine the description of nurses' ability to interpret ECG in detecting patient's cardiac function emergency	Quantitative with descriptive approach. the population in the study was 250 people and the sample was 38 people with purposive sampling technique.	Capabilities interpreting the ECG by nurses who were sampled in this study were still in the category of which is less

RESULTS AND DISCUSSIONS

A study conducted by Alalwan *et al.* (2023) mentioned that the knowledge of pre-hospital nurses in the regions of Mecca, Riyadh, and Sharqiyah in Saudi Arabia had an average ECG interpretation competency of 43.3%. It was also noted that paramedics with higher qualifications were 40.2% more proficient in ECG interpretation compared to those with lower qualifications. This is also in line with research conducted by Nusdin (2023), that the level of ability of nurses in interpreting ECG is still low. A low level of competence in ECG interpretation can result in incorrect diagnosis and inappropriate treatment, which can have a negative impact on patients. According to Ruhwanya *et al.* (2018), explaining that the more experienced a person is, the better his knowledge will be. This explains that if a nurse often performs ekg and interprets ekg, the nurse's knowledge will increase and be able to interpret ekg quickly and correctly. Long work experience will increase their knowledge and skills in conducting ECG analysis/interpretation. This is in line with research conducted by Rahimpour (2020), that nurses who are in the emergency room are more capable

of interpreting ECG than the EMS team (emergency medical service). Because nurses in the emergency room more often do ECG than the EMS team, besides emergency room nurses there are also nurses in the ICU who often do ECG. Like Isni's research (2022), which states that the knowledge of emergency room nurses and ICU nurses in interpreting ECG does not show significant differences.

Apart from experience and knowledge, there are other things that influence a nurse in interpreting ekg, such as in research conducted by Rosdiana (2022) to nursing students. The results of the study explain that in addition to knowledge and experience there are factors that influence the interpretation of EKG, namely beliefs and values, skills, personal characteristics, motivation, emotional issues and intellectual capacity.

Nurses' lack of knowledge in interpreting EKG should be a concern for us, because it can affect the treatment of patients. Therefore, regular training is needed to improve nurses' knowledge in interpreting EKG. As stated by Suradi Efendi (2023), that counselling activities are effective in improving nurses' understanding of

ECG interpretation and management of cardiovascular emergencies.

CONCLUSION

After reviewing several sources, the knowledge of a nurse can influence him in interpreting the results of the EKG, in addition to knowledge there are also things that influence the interpretation of EKG, among others: beliefs and values, skills, experience, personal characteristics, motivation.

Advice

For all nurses, especially those in the emergency department and intensive care unit, must be able to identify ekg, therefore it is necessary to conduct training for ekg interpretation regularly.

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