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# Record Results Analysis Electrocardiogram (ECG) at Pangandaran Health Center

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# Record Results Analysis Electrocardiogram (ECG) at Pangandaran Health Center

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**Abstract.** Heart disease has killed around 17.3 million people in the world and ranks first in the cause of death in Indonesia. Nurses as one of the health workers who are directly related to doctors and patients, will not be separated from the ECG. The nurse's ability to interpret the ECG will speed up the response to patients who have heart abnormalities. The purpose of this study was to determine the description of nurses' knowledge in interpreting the results of ECG recordings at Pangandaran Health Center. The method used is an experimental method, while the population in this study were all general nurses in Pangandaran Pangandaran Health Center as many as 50 people. Research Results: This study shows that the knowledge of nurses who have attended ECG training in interpreting ECG recordings is general nurses with good knowledge as many as 24 people (68.57%) and those who do not take EKG training that most general nurses with less knowledge 7 people (46.67%). The conclusion of this study is that nurses' knowledge in interpreting ECG recordings was 27 as good (54%). Suggestions for Pangandaran Health Center to continue evaluating and developing nurses' knowledge in interpreting ECG results.

## 1. Introduction

The Indonesian people today are faced with the problem of complex diseases and health problems due to the demographic shift from young people to the adult population and the elderly. This will have an impact on the occurrence of epidemiological transitions, namely changes in the pattern of death, namely due to infection, total fertility rates, life expectancy population and increasing non-communicable diseases or chronic diseases. This is closely related to the epidemiological transition from infectious diseases to degenerative diseases [1].

Globally in 2030 the epidemiological transition from infectious diseases to non-communicable diseases is increasingly clear. It is projected that the number of illnesses due to non-communicable diseases and accidents will increase and infectious diseases will decrease. PTMs such as cancer, heart disease, chronic DM and obstructive pulmonary disease, and other chronic diseases will experience a significant increase in 2030. Meanwhile infectious diseases such as TB, HIV / AIDS, Malaria, Diarrhea and other infectious diseases are predicted to decline in 2030 [2].

Every year more than 36 million people die from Non-Communicable Diseases (PTM) (63% of all deaths). More than 9 million deaths caused by non-communicable diseases occur before the age of 60 years, and 90% of these "early" deaths occur in low and middle income countries [3].

Globally, PTM is the number one cause of death every year is cardiovascular disease. Cardiovascular disease is a disease caused by impaired heart and blood vessel function, such as: Coronary Heart Disease, Heart Failure or Heart Disease, Hypertension and Stroke [3].

Heart disease has killed around 17.3 million people in the world in 2008, more than 3 million of these deaths occurred before the age of 60 years and could have been prevented. "Early" deaths caused by heart disease occur in the range of 4% in high-income countries up to 42% in low-income countries and are estimated to be 23.3 million by 2030. Heart disease is the number one cause of death in America with 37.3% of the causes of death from other diseases [3].

Heart and blood vessel disease currently ranks first in the cause of death in Indonesia. Approximately 25% of all deaths are almost caused by disorders of the heart and blood vessels. The results of the 2007 Riskesdas showed that the prevalence of some heart and blood vessel diseases such as hypertension (based on blood pressure measurements) was very high, which amounted to 31, 7%, while heart disease was 7.2% and stroke 8.3% per 1000 inhabitants.

*Survey Sample Regristration System* (SRS) in 2014 in Indonesia showed that coronary heart disease (CHD) was the highest cause of death at all ages after stroke, which was 12.9%. The 2013 Riskesdas data shows that the highest prevalence for cardiovascular disease in Indonesia is CHD, which is 1.5%. From this prevalence, the highest number is in East Nusa Tenggara Province (4.4%) and the lowest in Riau Province (0.3). According to the age group, CHD is most prevalent in the age group 65-74 years (3.6%) followed by the age group 75 years and above (3.2%), age group 55-64 years (2.1%) and age group 35-44 years (1.3%).

Based on the doctor's diagnosis, the highest number of people with coronary heart disease were in West Java in 2013 with 160,812 people (0.5%), while the highest number of patients with heart failure were in East Java with 54,826 people (0.19%). Stroke and hypertension constitute one third of the causes of death in Indonesia with 15, 4%, hypertension 6.8%, ischemic heart disease 5.1% and heart disease 4.6%.[3].

Based on the morbidity due to heart disease in Ciamis District in 2014 as much as 20.95% from 52,684 / year (Dinkes Ciamis, 2014). While in Pangandaran Pangandaran Health Center the number of heart patients in 2016 was 159 people, in 2017 it increased to 301 people, while as of March 2018 there were 54 patients with heart disease. This shows that heart disease is increasing every day as well as the death rate from heart disease will also increase.

The development of heart disease in recent decades requires health workers to be prepared to provide prompt and appropriate medical treatment. Health workers were no exception and specifically paramedics were in the Pangandaran Health Center. Paramedics at the Pangandaran Health Center are also required to be able to carry out initial treatment in cases of heart disease, to minimize the impact on heart disease. Because rapid handling can affect the condition of the next patient [4].

To achieve optimal health status, health workers are needed who can work professionally according to their respective expertise. Educational background will also influence a person's behavior in carrying out work ethics. The higher a person's education, the better the knowledge in implementing work rules [5].

Health services, especially in the field of nursing in the developing globalization era, are required to be more comprehensive, integrated, sustainable, quality, equitable and affordable for all levels of society. The concrete steps taken to fulfill these demands are realized by improving the performance of nursing management in managing patients professionally by paying attention to every development and change in the process of health services in Indonesia. The Pangandaran Health Center as part of the community health service center is responsible for continuously increasing efforts to expand and bring health services closer to the community with better quality and at a cost that is affordable to the community [6].

Heart disease is a disease caused by a disturbance in the anatomy and physiology of the heart and blood vessels which causes damage to oxygen delivery throughout the body, which can cause death[7].

Heart disease can be characterized by several signs and symptoms, where the most common signs and symptoms are chest pain, dipsnea, cyanosis, syncope, palpitations, edema, epigastric discomfort, but these signs can indirectly indicate that a person has heart disease. Therefore a diagnostic examination is needed to ensure that someone has heart disease [7].

Diagnostic examination is an examination conducted to add objective data after getting subjective data from the client. Investigation of a person with heart disease is an electrocardiogram (EKG), x-ray, *computerized tomography scanner* (CT scan), arteriography and others. The ECG is a recording of electrical potential that arises as a result of the electrical activity of the heart. The results that can be recorded are electrical activities that arise when the heart muscles contract, so that it can interpret the presence of arrhythmias, infarction and ischemia. ECG recordings are usually made on paper that runs at a standard speed of 25 mm / second and deplection of 10 mm according to the potential of 1 mV [7].

Patients with arrhythmia, infarction and ischemia, require continuous ECG monitoring. Patients need to be monitored well so that they can escape the risk of late help. In critical hospital care, cardiac care, and telemetry units, nurses are the ones most involved with ECG monitoring with the competency of placing electrodes, ECG monitoring, the purpose of determining monitoring, selecting leads and alarm parameters, watching monitors, evaluating and recording rhythms, telling doctor changes significantly and evaluates the effectiveness of treatment. Nurses need to have sufficient knowledge to carry out all responsibilities in caring for clients.

According to the Kementrian Kesehatan RI[3], nurses need to have adequate knowledge and skills in using ECGs to provide professional nursing services to patients with heart and blood vessel disease. The 2012 Wu research entitled *Retention of Knowledge By Nurses After An Online ECG Monitoring Course* stated that nurses' knowledge to interpret ECGs could improve service quality, both in the form of nursing advice to clients and desired outcome criteria.

Nurses as one of the health workers who are directly related to doctors and patients, will not be separated from the ECG. The nurse's ability to operate the ECG and interpret a simple ECG will speed up the response to patients who have heart abnormalities. Because nurses do recording, the position of the nurse becomes very strategic and very important because the first time to know whether there are abnormalities in the patient's heart, so the ability of nurses to interpret a simple ECG is needed [8]

As a professional nurse the ability to interpret an EKG is a profession demand that is not only limited to nurses who work in special units but all nurses who care for patients in health services, so that if the nurse immediately knows the results of the ECG record, it will be able to immediately provide help and collaborate with doctors, generally cases of MI ( *Myocard infarction* ) and other life-threatening heart disorders and require immediate help, so the ability of nurses to analyze or interpret the results of ECG recordings is very necessary [8].

In fact, there are still a lot of nurses in Pangandaran Health Center who do not understand how to install and interpret the results of ECG recordings. Based on the results of the preliminary study to 10nurses, it was found that 6 nurses did not understand the method of installation and interperation of the ECG record and only 4 nurses understood the method of installation and interpreted the ECG results.This is because not all nurses have received special training on installation and how to interpret the ECG.

## 2.   Research Methods
The design of this study is descriptive, which is meant by descriptive method is a method of research carried out with the main purpose of making a description or description of a situation objectively. Descriptive research methods are used to solve or answer problems that are being faced in the current situation [9].

Where in solving the problem, this research is only looking at a picture of a condition about nurses' knowledge in interpreting EKG results. The category of research results for each sub-variable is categorized as true, not correct.

### 3.  Research Result

**Table 1.** Frequency Distribution of Knowledge Level of General Nurses who Have Attended ECG Training in Interpreting ECG Records

| Statement | Frequency | % |
|---|---|---|
| Well | 24 | 68,57 |
| Enough | 11 | 31.43 |
| Less | 0 | 0 |
| Total | 35 | 100 |

Based on table 4. 1, it is known that most of the knowledge of respondents who had attended ECG training in interpreting EKG recordings was general nurses with good knowledge of 24 people (68.57%).

**Table 2.** Frequency Distribution of Knowledge Level of General Nurses who Did Not Attend ECG Training in Interpreting ECG Records

| Statement | Frequency | % |
|---|---|---|
| Well | 3 | 20 |
| Enough | 5 | 33,33 |
| Less | 7 | 46.67 |
| Total | 15 | 100 |

Based on table 4. 2 it is known that out of 15 respondents who did not take EKG training it was known that nurses' knowledge in interpreting ECG recordings was mostly general nurses with less knowledge as many as 7 people (46.67%).

**Table 3.** Frequency Distribution of Knowledge Level of General Nurses in Interpreting the results of ECG Records

| Statement | Frequency | % |
|---|---|---|
| Well | 27 | 54 |
| Enough | 16 | 32 |
| Less | 7 | 14 |
| Total | 50 | 100 |

Based on table 4. 3, it is known that most of the respondents' knowledge in interpreting EKG recordings is general nurses with good knowledge as many as 27 people (54%) .

### 4.   Discussion

*4.1. Knowledge of General Nurses who Take ECG Training*

Based on the results of the study, it was found that most of the knowledge of respondents who had attended ECG training in interpreting EKG recordings was general nurses with good knowledge of 24 people (68.57%).

This is consistent with the theory of Notoatmodjo [9] which states that knowledge or cognitive is a domain that is very important for the formation of one's actions ( *overt behavior* ). In reality, behavior based on knowledge will be more lasting than behavior that is not based on knowledge [9].

With increasing cases of heart disease and increasing services in Pangandaran Health Center both inpatient and outpatient care that have been equipped with ECG recording devices as a checkup. So ECG training needs to be held to improve the skills of paramedics or doctors to be able to find out heart abnormalities from the results of ECG recordings. This ECG training is expected to help the work of both paramedics and doctors in dealing with patients, especially patients who are serious.

Good knowledge in interpreting ECG recordings can be influenced by several factors, one of which is training. The ultimate goal of each training is for trainees to transfer what is learnedin the training to be applied in the real world. The results of the study on nurses who attended the training were mostly

good knowledge because nurses had received enough information, skills and knowledge about ECGs obtained from the training that had been followed including BLS or BTCLS.

This is in line with Rifai's [10] research entitled Improved Interpretation Ability of Nurses' *Electrocardiogram (Ecg)* with Learning and Multimedia Learning at Dr. From the results of the study, Soeratno Sragen found that there were significant differences between training (training) and training methods using modules on the level of ECG interpretation ability in nurses at Gemolong Sragen Regional Hospital in 2016 where the level of ECG interpretation ability. the majority of ECG interpretations have a good level of ability.

### 4.2. Knowledge of General Nurses who do not take ECG Training

Based on the results of the study, it was found that out of 15 respondents who did not take EKG training, it was known that nurses' knowledge in interpreting ECG recordings was mostly general nurses with less knowledge as many as 7 people (46.67%), nurses with sufficient knowledge of 5 people (33, 33%) and 3 people (20%) nurses with good knowledge.

According to Notoadmojo [9], training has an important goal to improve knowledge and skills as the overall success criteria for the program. Training is a good effort for health workers to improve insight through learning experience.

The purpose of ECG training is so that the course participants can interpret the ECG well, especially in handling and recognizing the condition of patients with emergencies that are often encountered in daily practice so that they can decide on appropriate management of their patients [11].

The importance of ECG training for health workers has been examined by Wulandari [12], who stated that the need for Basic Life Support (BLS) and electrocardiogram (ECG) training (66.7%) for nurses in public and surgical clinics while ECG training, BLS and patient safety (83.3%) for nurses at specialist clinics.

Lack of knowledge in interpreting ECG recordings is closely related to ECG training that has been followed. The Pangandaran Health Center is obliged to provide ECG training. During this time training such as *Basic Life Support (BLS)* and electrocardiogram (ECG) training could only be attended by nurses with their own funds. This tends to cause nurses to be reluctant to attend existing training, so that nurses' knowledge of electrocardiogram is still very limited. General Nurse Knowledge in Interpreting ECG Records.

Based on the results of the study, it was found that the majority of nurses' knowledge in interpreting the ECG record was good as many as 27 people (54%) and nurses with enough knowledge as many as 16 people (32%) and general nurses with less knowledge as many as 7 people (14%).

There are still nurses who have less knowledge in interpreting ECGs, this certainly raises its own concerns over the ability of nurses in analyzing ECG results, where it is feared that nurses will be less able to recognize the condition of patients experiencing emergencies. A good knowledge of nurses on the interpretation of ECG results will facilitate monitoring and management of patients.

The level of knowledge that is still less likely to arise due to the fact that there are still nurses who do not take ECG training at Pangandaran Health Center. It can be seen that there were 15 nurses (30%) who did not take ECG training.

Knowledge is the result of knowing, and this happens after someone has sensed a certain object. Sensing occurs through the five human senses, namely the senses of vision, hearing, smell, taste and touch. Most knowledge is obtained through the eyes and ears. Knowledge or cognitive is a very important domain in shaping one's actions (over behavior) [9].

## 5. Conclusion

Based on the results of the analysis and discussion about the description of nurses' knowledge in interpreting the ECG recordings in Pangandaran Health Center, it can be summarized as follows:
1. Knowledge of general nurses who had attended ECG training in interpreting ECG recordings of 35 nurses, most of whom had good knowledge as many as 24 people (68.57%)

2.  Knowledge of general nurses who did not take ECG training in interpreting ECG recordings of 15 nurses who did not take ECG training mostly had less knowledge as much as 7 people (46.67%)
3.  Knowledge of nurses in interpreting the results of ECG recordings in Pangandaran Health Central in general, most have good knowledge as many as 27 people (54%), nurses with enough knowledge as many as 16 people (32%) and nurses with less knowledge as many as 7 people (14%).

## 6. Suggestion

From the results of the research that has been described , the authors can provide suggestions that might be used as input, namely as follows:

*6.1  For Pangandaran Health Center*

From the results of the research, all nurses have good knowledge, therefore the authors suggest that the Pangandaran Health Centercontinue to evaluate and increase the knowledge of existing nurses so that nurses' knowledge can be maintained and even improved and this applies to all existing nurses by facilitating nurses in training ECG

*6.2  For Nurses*

The author recommends increasing knowledge by attending ECG training or forming a forum that aims to exchange information and knowledge about ECG with fellow nurses who have attended previous ECG training so that it will have an impact on the nurses' knowledge.

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