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# Cardiovasculer Emergency Nursing: A Case Report

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## ABSTRACT

Cardiovascular emergencies are diseases caused by heart and blood vessel failure. The cardiovascular system is a vital system in the human body. Therefore, diseases affecting this system can directly affect a person's survival. Researchers found several complaints, including shortness of breath, weakness, chest pain, and fatigue. Overlying diagnoses for patients with cardiovascular emergencies included decreased cardiac output, ineffective breathing patterns, and acute pain. Interventions for patients with cardiovascular emergencies were tailored to the diagnosis of bleeding. Evaluation of patients with cardiovascular emergencies was conducted for approximately 6 hours in the Emergency Department to determine the underlying issues. Most problems were unresolved and required further treatment, including hospitalization.

**Keywords:** cardiovascular system, emergency department.

## Background

The cardiovascular system is responsible for transporting blood, which contains nutrients, metabolic waste, hormones, immune substances, and other substances throughout the body. This ensures that every part of the body receives nutrients and can dispose of metabolic waste into the blood. (1)According to the WHO, cardiovascular disease is a disease caused by heart and blood vessel failure. The cardiovascular system is a very vital system in the human body. Therefore, diseases that occur in this system can directly affect a person's survival. (2).

Diseases of the cardiovascular system are mostly caused by disorders of the heart and blood vessels. In the United States, 39.5% of deaths in 2022 were caused by cardiovascular diseases. (3)Meanwhile, in Indonesia, cardiovascular disease causes approximately 651,481 deaths each year. This disease is dangerous because it can develop without symptoms or discomfort. As a result, the disease can only be detected when it has reached a severe stage that can trigger dangerous complications. (2) Heart disease is one of the major health problems that is the number one cause of death worldwide, which is estimated to continue to increase to 23.3 million by 2030. Non-communicable diseases are the biggest cause of premature death in Indonesia. The number of heart disease sufferers in Indonesia continues to increase. Each year, more than 36 million people die from non-communicable diseases (NCDs) (63% of all deaths), and 90% of premature deaths occur in low- and middle-income countries. (4)In Southeast Asia, deaths from coronary heart disease reached 3.9 million people, with 48% of them dying before reaching the hospital (5)

Based on data obtained from a preliminary study at the Aminah General Hospital Emergency Room in Blitar City during a month of practice in the emergency room, the researcher observed data on cardiovascular system emergencies in approximately 8-10 patients out of 30 patients per shift. The average number of patients per shift was 25-30 patients. Patients with cardiovascular emergencies

typically presented with complaints of shortness of breath and weakness, as well as edema in several parts of the body and organs. The author was interested in describing and documenting emergency nursing care for cardiovascular emergencies in the emergency room at Aminah General Hospital in Blitar City.

**Results**

Based on the results of nursing care provided to four patients with cardiovascular emergencies at the Aminah General Hospital Emergency Room in Blitar City, it was found that all four patients had the same complaints. The assessment found that three patients complained of shortness of breath, weakness, accompanied by low saturation of less than 95 percent (95%), and one patient complained of nonspecific chest pain. The nursing diagnoses that emerged in these cardiovascular system cases were decreased cardiac output, ineffective breathing pattern, and acute pain. The nursing interventions provided to the four patients were similar but tailored to each patient's condition. Nursing implementation was carried out directly by the researcher in the emergency room of Aminah General Hospital in Blitar City and supervised by emergency room nurses and doctors. Nursing evaluation was carried out directly, and all interventions met the planned time and outcome criteria.

**Discussion**

The cardiovascular system assessment of the four cases analyzed by the researchers showed that one of the assessments was related to gender, namely male and female. Previous research data showed that women have a higher risk of suffering from cardiovascular disease, but have a lower risk of death and hospitalization. This may be influenced by postmenopausal changes in sex hormone levels, higher levels of inflammation, and chronic microvascular dysfunction in women. These factors, combined with different dimensions and functions of the left ventricle, which become more pronounced with age, lead to a higher prevalence of left ventricular diastolic dysfunction at rest and during exercise. As a result, women have lower exercise capacity and quality of life compared to men. According to researchers, gender does not significantly influence the occurrence of cardiovascular disease, but the disease adapts to the patient. If patients are able to manage activities such as regular doctor visits, taking medication regularly, and managing stress, they may be able to reduce hospitalization rates (6).

Previous studies have found that the age characteristics of respondents suffering from cardiovascular disease show that the majority of cardiovascular disease sufferers are in early to middle adulthood. Cardiovascular disease is a primary disease that occurs in adults and can reach 6% - 10%. According to the study, this is due to poor health habits in modern times, especially among young people who prefer instant foods, which can damage organs and are unhealthy. According to researchers, most patients admitted to the emergency room are those with cardiovascular disease who never underwent physical examinations in their youth, ignored minor complaints that arose and did not seek immediate medical attention, as well as patients who had already been diagnosed with cardiovascular disease but did not undergo routine check-ups every schedule because they felt that the complaints were no longer there. This results in a high hospitalization rate, with the majority of patients being elderly or in the sixth stage of human development, and are patients whose conditions are no longer under control. (7).

There are two previous studies that both address cardiovascular system cases. The results of the first study show blood pressure measurements of 172/81 mmHg and a history of high blood pressure. This contrasts with the second study, which shows normal blood pressure measurements and patients with no blood pressure problems, with physical examination results of 128/80 mmHg (8) (9). According to previous studies, the underlying conditions that cause heart muscle dysfunction, leading to cardiovascular disorders, include coronary atherosclerosis, arterial hypertension, and other degenerative or inflammatory diseases. According to the researchers, high blood pressure readings without any complaints or other symptoms strongly support the occurrence of cardiovascular system disorders, but this needs to be re-examined and requires a definitive diagnosis from a doctor (8).

From the four case studies attached by the researcher, there were three main complaints from patients, namely shortness of breath (dyspnea), weakness, and pain. According to previous studies,


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shortness of breath in patients with cardiovascular disease is caused by the inability of the heart muscle to pump blood throughout the body, causing difficulty breathing (dyspnea), especially during activity.(10)Patients with cardiovascular disorders often feel tired and short of breath even when performing light activities or at rest. This condition is caused by a lack of tissue oxygenation and energy production, which is influenced by dyspnea. This can lead to a decrease in the patient's ability to perform daily activities, as well as a decline in their quality of life. Meanwhile, according to research on patients with congestive heart failure (CHF), pain complaints in patients with cardiovascular disorders arise because the left ventricle is unable to pump blood from the lungs (9).This results in increased pressure in the pulmonary circulation, which then causes fluid to be pushed into the lung tissue, causing chest pain that tends to spread to other parts of the body. According to research on heart failure patients, the signs and symptoms of heart failure are related to ventricular dysfunction. Left ventricular dysfunction causes pulmonary congestion in the form of dyspnea during activity, leading to fatigue, while right ventricular dysfunction causes edema and weakness (11).

The four patients analyzed had respiratory disorders with symptoms of a breathing rate of more than 20 breaths per minute in 3 patients, with SPO2 < 95%. According to research, this complaint is the most common symptom experienced by patients with cardiovascular disorders. This complaint causes shortness of breath or dyspnea because the heart is unable to pump blood from the pulmonary veins, resulting in fluid buildup in the lungs(11). The presence of fluid in the lungs will interfere with gas exchange, resulting in additional sounds heard during chest auscultation and percussion. One of the characteristics of respiratory distress is the presence of additional sounds when the patient breathes, such as wheezing (a high-pitched whistling sound, like a whistle), and rhonchi (low-pitched, coarse breathing sounds resembling snoring, rumbling, or groaning). According to researchers, complaints of shortness of breath, additional sounds during percussion and auscultation examinations of the chest need to be performed carefully and cautiously because the respiratory system is the main vital system before the heart. Therefore, it is necessary to include other supporting examinations to complete the diagnosis (12)(13).

From the four cases analyzed, the diagnoses of decreased cardiac output, ineffective breathing patterns, and acute pain emerged. According to theory, diseases of the cardiovascular system will lead to nursing diagnoses of decreased cardiac output, acute pain (due to myocardial ischemia), ineffective tissue perfusion, activity intolerance, anxiety, and ineffective breathing patterns. However, based on the author's assessment, only two nursing diagnoses were identified: decreased cardiac output and ineffective breathing pattern. The other nursing diagnoses were not raised by the researcher because there was no data to support the major data for these diagnoses. Of the four data analyses conducted by the researcher, all four raised the diagnosis of decreased cardiac output, one of which raised the accompanying diagnosis of acute pain, and the other three raised the accompanying diagnosis of ineffective breathing pattern.

Of the four cases analyzed, there was one common diagnosis, namely decreased cardiac output, with the main supporting data being electrocardiogram (ECG) results, which showed that all four patients had cardiac electrical disturbances. Based on the data obtained in the field, the correct diagnosis was decreased cardiac output. Two patients had additional data supporting the diagnosis of reduced cardiac output, namely edema in the right and left legs and decreased urine output. One patient also had supporting data in the form of a troponin test, which is a blood test to detect heart muscle damage, especially for the early diagnosis of heart attack (myocardial infarction). Troponin protein is released into the bloodstream when the heart muscle is damaged, so high levels indicate heart injury (14).

The final nursing diagnosis is acute pain that is only felt or obtained from one patient. The pain complaint is not accurate enough to raise a diagnosis of cardiovascular system disorder, but it can be raised because it meets the Indonesian nursing diagnosis standards, namely acute pain. This patient complains of severe heartburn that spreads and penetrates the back. Because in several studies, pain in patients with cardiovascular system disorders tends to be felt in the chest, according to previous studies, patients suffering from cardiovascular system diseases tend to complain of left chest pain (9).

Cardiac care is an intervention focused on emergency treatment for life-threatening conditions that occur suddenly in patients with cardiovascular emergencies. In developing nursing interventions for patients with cardiovascular emergencies, researchers used the Indonesian Nursing Intervention Standards. Based on nursing diagnoses, researchers provided interventions in the form of acute cardiac

care I.02076 for all four patients. Airway management with code I.01011 was one of the actions given to patients during the intervention to reduce complaints of shortness of breath and low saturation levels. Pain management I.08238 was an intervention given to reduce the scale of pain felt by patients (15)(16)

The implementation provided by researchers to four patient cases included implementation that was not carried out in the emergency room due to conditions, circumstances, and time constraints. However, this did not apply to referral patients or patients with red triage. The cases taken by researchers were patients with yellow triage, so several actions were skipped to accommodate the crowded emergency room, time constraints, and circumstances.

In the diagnosis of decreased cardiac output, there are interventions that cannot be performed in the emergency room, namely relaxation therapy to reduce anxiety, providing a conducive environment, giving emotional support, and techniques to reduce anxiety. Research result explains how nurses divide tasks in order to maintain a busy emergency room environment, some implementations are continued in the inpatient ward. However, researchers always strive to involve families in the implementation process, as they can help reduce the anxiety experienced by patients (17).

The diagnosis of ineffective breathing patterns that is not implemented is to perform mucus suctionIn less than 15 seconds, hyperoxygenation was performed prior to endotracheal suctioning and removal of solid obstructions with McGill forceps. This was not done because the three patients, namely patients 1, 2, and 3, did not experience obstruction of the respiratory system caused by solid objects. Mucus suction was performed for less than 15 seconds because there were no supporting indications in patients 1, 3, and 4. The indications for suctioning include excessive secretions in the airway, respiratory distress, additional sounds heard on auscultation, increased respiratory pressure on the ventilator, decreased oxygen saturation, and decreased consciousness in the patient, resulting in a lack of cough reflex and accumulation of secretions in the airway (18).

Several interventions from the acute pain nursing diagnosis experienced by patient 2 were not carried out, namely assessing in depth the patient's influence and knowledge of pain, as well as the division of tasks and time management, which are crucial in the emergency room, so that several interventions were carried out or continued by the ward nurses, as stated (19). The Emergency Nursing textbook explains that "One of the daily activities of nurses is to periodically assess the patient's vital signs and responses, and adjust the Philosophy, Holistic, and Process of Emergency Patient Nursing 7 care plan based on the evaluation results" so that not all actions must be taken in the emergency room at that moment. Nursing interventions also require careful assessment in following up on the conditions in the Aminah General Hospital Blitar City ER, which has recently had many visitors, from inpatients to outpatients or referrals from clinics.

Evaluation is the final process in a series of nursing processes, which is an assessment of a series of interventions and implementations that have been carried out (20). In the four cases taken by the researcher after the implementation of nursing interventions carried out by the researcher, some of the problems were resolved within 1x6 hours in accordance with the outcome criteria set at the beginning of the planning stage. There were no unresolved nursing problems, but the condition of all patients required further observation by doctors and other health personnel. Therefore, the researcher's preliminary evaluation was that the problems were partially resolved. Interventions or possibly changes in diagnosis could occur in the room depending on the conditions, and improvements or deteriorations could occur at any time in the four patients. Therefore, to maximize the improvement of the patients' conditions, they were transferred to the inpatient ward.

## Conclusions and Recommendations

The conclusion drawn from four cases of patients in the emergency room at Aminah General Hospital in Blitar City by the researcher is that the assessment found that three patients complained of shortness of breath and weakness, with below-normal saturation (<95%), and one patient complained of nonspecific chest pain. The nursing diagnoses that emerged in cases involving the cardiovascular system were that all four patients had a primary diagnosis of decreased cardiac output, three patients had a secondary diagnosis of ineffective breathing pattern, and one patient had a secondary diagnosis of acute pain. The nursing interventions provided in the four cases had similarities that had been adjusted to the conditions of each patient. The implementation of nursing care was carried

out directly. During the implementation process as a whole, everything went smoothly. The nursing evaluation was conducted directly, and all interventions were carried out had been carried out met the planned time outcome criteria.

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