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Nursing Care for Decreased Cardiac Output with Nursing Intervention: Measurement of Fluid Intake and Output in CHF Patients at Menggala Regional General Hospital

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ABSTRACT

Background & Objective: Patients with congestive heart failure (CHF) commonly experience shortness of breath due to impaired myocardial contractility, which leads to reduced cardiac output and subsequently decreases systemic blood circulation. This condition can result in several complications such as dyspnea, orthopnea, exertional dyspnea, paroxysmal nocturnal dyspnea (PND), edema, ascites, cardiogenic shock, and decreased oxygen saturation. Patients who exhibit clinical signs and symptoms of heart failure often present with actual or potential nursing problems, which can affect basic human needs, such as decreased cardiac output. One of the appropriate nursing interventions for this issue is monitoring the patient's daily fluid intake and output. The aim of this study is to determine the effectiveness of the nursing intervention of fluid intake and output monitoring in hospitalized CHF patients. **Method:** This study employs a descriptive approach using a case study design. The respondents in this case were two patients diagnosed with CHF. The nursing intervention involved measuring the patients' fluid intake and output over a 24-hour period and evaluating the outcomes by calculating fluid balance. **Result:** The results of the nursing care showed that Patient 1 had a fluid balance of -300 ml and Patient 2 had a fluid balance of -580 ml. **Conclusion:** These findings suggest that the intervention of fluid intake and output monitoring can be applied to CHF patients to improve their quality of life.

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Introduction

Congestive Heart Failure (CHF) is a condition in which the heart is unable to pump blood effectively throughout the body, resulting in insufficient delivery of oxygen and nutrients to body tissues. As a consequence, individuals with this condition commonly experience shortness of breath due to inadequate oxygen supply. The term CHF is generally used to refer to both left-sided and right-sided heart failure (Brunner & Suddarth, 2021).

According to information released by the World Health Organization (WHO) in 2020, cardiovascular disease is one of the leading causes of death worldwide. Furthermore, data from the Global Health Data Exchange (GHDx) in the same year reported that the global number of CHF cases reached 64.34 million, with approximately 9.92 million deaths attributed to this condition (Lippi, 2020). The Indonesian Ministry of Health reported that congestive heart failure ranked second as the leading cause of death in Indonesia in 2020. Data from the 2018 Basic Health Research (Riskesdas) indicated that approximately 1.5%, or 1,017,290 people in Indonesia, were living with congestive heart failure (Ministry of Health of the Republic of Indonesia, 2022). Patients with CHF frequently also experience hypertension and are required to undergo routine health check-ups. In Lampung Province, hypertension is the third most common disease after dyspepsia (Lampung Provincial Health Profile, 2022).

The causes of congestive heart failure can be classified based on the part of the heart that is affected. When the left side of the heart is involved, contributing conditions include ischemic heart disease, aortic valve disorders, mitral valve disease, myocarditis, cardiomyopathy, cardiac amyloidosis, and high-output states such as thyrotoxicosis, anemia, and arteriovenous fistula, as well as hypertensive heart disease. In contrast, right-sided heart failure may result from left-sided heart failure, chronic lung disease, tricuspid valve disorders, congenital heart defects such as ventricular septal defect (VSD) and patent ductus arteriosus (PDA), pulmonary hypertension, pulmonary valve stenosis, and massive pulmonary embolism (Chandrasoma, 2006, cited in Aspiani, 2019).

According to Smeltzer and Bare (2020), individuals with congestive heart failure often experience dyspnea due to impaired myocardial contractility, which leads to reduced cardiac output and decreased systemic perfusion. This condition may result in various clinical manifestations, including shortness of breath, orthopnea, exertional dyspnea, paroxysmal nocturnal dyspnea (PND), edema, ascites, and in severe cases may progress to cardiogenic shock and decreased blood oxygen levels.

Patients presenting with the clinical signs and symptoms of heart disease may experience both actual and potential nursing problems that affect the fulfillment of basic human needs. These include decreased cardiac output, impaired gas exchange, ineffective breathing patterns, inadequate peripheral perfusion, activity intolerance, excess fluid volume, pain, anxiety, nutritional imbalance, and risk for impaired skin integrity (Aspiani, 2019).

Congestive heart failure occurs when left ventricular contractility decreases, resulting in impaired ability to pump blood throughout the body. This leads to fluid accumulation in the left ventricle. If this process persists, fluid will accumulate in the left atrium, causing a backward flow of blood into the pulmonary veins and subsequently resulting in pulmonary edema. This condition, also referred to as cardiogenic pulmonary edema or volume overload edema, occurs due to increased

hydrostatic pressure in the pulmonary capillaries, which promotes transvascular fluid filtration. Hydrostatic pressure is the pressure exerted by plasma and blood cells within the capillaries. Transvascular fluid filtration refers to the movement of fluid across a semipermeable membrane through which certain solutes cannot pass. In this condition, fluid moves from areas of higher pressure to lower pressure, causing swelling in specific tissues.

In addition, when the right ventricle is unable to effectively pump blood to the lungs, fluid accumulates in the right ventricle, resulting in reduced effective circulating blood volume and stimulating the heart to increase hydrostatic pressure. If this condition continues, fluid will accumulate in the right atrium, causing venous backflow into the peripheral veins. Peripheral edema then develops, commonly in the hands, ankles, and other dependent areas. Peripheral edema typically begins in the feet and heels, progresses to the lower legs and thighs, and may eventually involve the genital region and lower trunk. If not promptly managed, this condition may lead to discomfort, decreased quality of life, postural changes, sensory disturbances in the lower extremities, reduced mobility, skin damage, and increased risk of falls (Aspiani, 2019).

In patients with congestive heart failure, nursing management strategies include improving myocardial contractility and systemic blood flow, providing adequate rest, positioning the patient in a semi-Fowler's position, administering oxygen therapy as indicated, restricting fluid and sodium intake, and monitoring fluid balance (Aspiani, 2019). The role of nurses encompasses providing nursing care based on the nursing process, including assessment, nursing diagnosis, planning, implementation, and evaluation. In addition, nurses function as educators by delivering health education to patients and their families (Nursalam, 2021).

Preliminary data obtained by the researcher indicated that the number of patients treated at RSUD Menggala, particularly in the Kenanga ward, over the past three months (January to March) was 266 patients. Cardiovascular disease was among the most common conditions observed in this ward. Nurses, as part of their professional responsibilities, are required not only to provide direct care but also to deliver appropriate health education to patients and their families. Interviews with hospitalized patients revealed that many had not received sufficient information regarding the management of their disease. In cases of fluid overload, fluid accumulation in the body may lead to worsening dyspnea and edema. Peripheral edema usually appears in the hands, ankles, and other dependent areas, beginning in the feet and heels, progressing to the calves and thighs, and eventually involving the genital region and lower body (Aspiani, 2019).

Based on the preliminary survey of patients diagnosed with CHF, it was found that patients had not adequately restricted their fluid intake and continued to consume fluids whenever they felt thirsty. The observed consequences included worsening dyspnea, bilateral lower extremity edema, and a positive fluid balance of +650 mL. A study by Putradana (2021), entitled The Effect of a Sodium-Restricted Diet and Android-Based Fluid Restriction on Fluid Balance and Dyspnea in Patients with Congestive Heart Failure, demonstrated that interventions involving sodium restriction and fluid limitation significantly affected fluid balance in CHF patients.

Based on the background described above, the researcher's role as a nurse in providing nursing care, particularly to patients with CHF, is crucial in delivering effective health education. This can be achieved through education focused on

monitoring fluid intake and output so that patients and their families are able to independently measure fluid intake both in hospital and at home. Therefore, the author is interested in selecting the final project title: "Nursing Care for Decreased Cardiac Output with a Nursing Intervention of Monitoring Fluid Intake and Output in Patients with Congestive Heart Failure at RSUD Menggala."

Objective

The objective of this study is to describe nursing care for patients with decreased cardiac output through a nursing intervention focused on monitoring fluid intake and output in patients with congestive heart failure (CHF) at RSUD Menggala.

Method

The design of this final scientific paper employed a descriptive approach using a case study method. The subjects of this study consisted of two patients who were hospitalized with a diagnosis of congestive heart failure (CHF) and experienced the nursing problem of decreased cardiac output at RSUD Menggala.

The first patient, Mrs. R, a 72-year-old woman, was diagnosed with congestive heart failure and hypertension. The second patient, Mrs. H, a 68-year-old woman, was diagnosed with congestive heart failure and community-acquired pneumonia.

Results and Discussion

In this discussion, the author examines the relationship between nursing theory and the implementation of nursing care in Patient 1 and Patient 2 diagnosed with Congestive Heart Failure (CHF). Nursing care for Patient 1 was conducted from April 14 to April 16, 2025, while care for Patient 2 took place from April 17 to April 19, 2025, in the Kenanga (geriatric) ward at RSUD Menggala Tulang Bawang. This discussion covers all stages of the nursing process, including assessment, nursing diagnosis, nursing interventions, implementation, and evaluation.

Patient 1, Mrs. R, a 72-year-old woman, was admitted on April 14, 2025, with a primary medical diagnosis of CHF, presenting with sudden onset of dyspnea upon awakening, worsening shortness of breath during activity, and generalized weakness. Patient 2, Mrs. H, a 68-year-old woman, was admitted on April 16, 2025, with a diagnosis of CHF and community-acquired pneumonia, complaining of continuous shortness of breath for three days, aggravated by activity, productive cough, nausea, and headache. The symptoms experienced by both patients are consistent with Brunner and Suddarth (2021), who state that individuals with CHF commonly experience dyspnea due to inadequate oxygen delivery. Smeltzer and Bare (2020) further explain that impaired myocardial contractility reduces cardiac output and systemic perfusion, resulting in dyspnea, orthopnea, exertional dyspnea, paroxysmal nocturnal dyspnea, ascites, and in severe cases, cardiogenic shock and hypoxemia.

Physical examination and observation revealed similar findings in both patients. Patient 1 appeared dyspneic, used accessory respiratory muscles, had a respiratory rate of 26 breaths per minute, jugular venous distention, bilateral lower extremity edema, greater fluid intake than output, cold extremities, and a capillary refill time (CRT) of less than 2 seconds. Patient 2 also appeared dyspneic with accessory muscle use, respiratory rate of 25 breaths per minute, jugular venous distention, bilateral lower extremity edema, higher intake than output, cold extremities, CRT greater than 2 seconds, and worsening dyspnea with activity. These findings are consistent with

Wijaya (2020), who reported that left-sided heart failure manifests as dyspnea, cough, reduced oxygen saturation, and impaired tissue perfusion, while right-sided heart failure results in peripheral edema, weight gain, jugular venous distention, and weakness.

Supporting examinations performed for both patients included laboratory tests, chest radiography, and electrocardiography (ECG). According to Wijaya (2020), diagnostic evaluations for CHF may include laboratory testing, radiological imaging, ECG, and echocardiography. However, echocardiography was not performed in these cases because the hospital was not yet able to provide this service at the time of care.

Based on the assessment findings, the nursing diagnosis established for both patients was decreased cardiac output related to altered preload (D.0008). According to the Indonesian Nursing Diagnosis Standards (SDKI), nursing diagnoses are formulated based on major and minor defining characteristics. In both patients, major data included dyspnea, fatigue, bilateral lower extremity edema, and jugular venous distention, while minor data included cold extremities and prolonged CRT. These findings support the diagnosis of decreased cardiac output related to altered preload. The author assumes that the edema resulted from fluid accumulation due to impaired right ventricular pumping, leading to venous congestion, which is consistent with Aspiani (2019), who stated that right-sided heart failure commonly causes peripheral edema.

Nursing interventions were developed based on the Indonesian Nursing Intervention Standards (SIKI), with expected outcomes referring to the Indonesian Nursing Outcome Standards (SLKI), namely improved cardiac output, reduced dyspnea, decreased edema, reduced fatigue, and stabilized blood pressure. Planned interventions included identifying primary signs of decreased cardiac output, monitoring vital signs, monitoring fluid intake and output and 24-hour fluid balance, assessing chest pain, encouraging gradual physical activity, and collaborating in the administration of antiarrhythmic and diuretic therapy. These interventions are supported by Putradana (2021), who found that sodium restriction and fluid limitation significantly influenced fluid balance in patients with CHF.

Implementation of nursing care was conducted according to the established plan. Interventions included monitoring vital signs, assessing signs and symptoms of decreased cardiac output, monitoring intake and output, administering oxygen therapy as needed, positioning patients in semi-Fowler's position, encouraging gradual activity, providing education to patients and families regarding independent monitoring of fluid intake and output, restricting fluid intake to 600 mL per day, and collaborating with physicians in administering omeprazole and intravenous furosemide. Health education was emphasized to promote patient independence and prevent recurrence of fluid overload. The nursing actions provided were consistent with patient needs and aligned with previous studies, including Purnama Sari (2023), which highlighted the importance of fluid restriction, vital sign monitoring, 24-hour fluid balance monitoring, and diuretic collaboration.

Evaluation was conducted at the end of each shift using the SOAP method. By the third day, both patients demonstrated clinical improvement. Patient 1 reported reduced dyspnea and fatigue, no longer required supplemental oxygen, showed decreased edema, achieved a negative fluid balance of −300 mL/24 hours, and had stable vital signs. Patient 2 similarly reported decreased dyspnea and productive cough, reduced edema, negative fluid balance of −580 mL/24 hours, and stable

oxygen saturation without supplemental oxygen. These outcomes indicate improvement in decreased cardiac output. The findings are consistent with Purnama Sari (2023), who reported that appropriate hypervolemia management in CHF patients resulted in reduced edema, improved vital signs, and improved fluid balance.

Conclusion

The assessment findings from both cases revealed similar primary complaints, including dyspnea, generalized weakness, activity-induced shortness of breath, and bilateral lower extremity edema. The main nursing diagnosis identified in both patients with Congestive Heart Failure (CHF) was decreased cardiac output related to altered preload. Nursing interventions, both independent and collaborative, focused on cardiac care, including monitoring vital signs and fluid balance, providing health education on intake and output measurement, and collaborating in medical therapy. After three days of nursing care, evaluation using the SOAP method indicated that the nursing problems in both patients were resolved.

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