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# Analysis of Nursing Practice in Clients with Cardiovascular System Disorders: A Primary Case of Congestive Heart Failure with the Implementation of Alternate Nostril Breathing Exercise on Hemodynamic Status

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**ABSTRACT**

Background: Congestive Heart Failure (CHF) is a progressive cardiovascular disorder in which the heart cannot pump blood effectively, leading to impaired hemodynamics and reduced quality of life. Complementary interventions such as Alternate Nostril Breathing Exercise (ANBE) may improve cardiovascular stability through relaxation and oxygenation enhancement.
Methods: This nursing practice was conducted at Pusri Hospital Palembang on a CHF patient. ANBE was performed twice daily for seven consecutive days, with each session lasting 10 minutes under nurse supervision. Hemodynamic parameters including blood pressure, heart rate, respiratory rate, and oxygen saturation were measured before and after each session.
Results: Post-intervention findings showed improved hemodynamic stability, with reductions in blood pressure and heart rate, increased oxygen saturation, and more regular respiratory patterns. The patient also reported feeling calmer and experiencing reduced shortness of breath. These improvements suggest that ANBE effectively supports cardiovascular function in CHF management.
Conclusion: ANBE is a simple, non-invasive, and cost-effective nursing intervention that can be integrated into CHF patient care both in hospital and at home. It has potential as a complementary therapy to enhance hemodynamic stability and overall patient well-being. Further studies with larger populations are recommended to strengthen evidence for its clinical application.



## INTRODUCTION

Cardiovascular disease remains a global threat. Data from the Global Burden of Cardiovascular Disease shows that there were around 19.1 million deaths related to cardiovascular disease globally in 2020. This increased from the previous year, which recorded 18.6 million deaths due to cardiovascular disease. According to the American Heart Association (AHA), this mortality rate is predicted to continue to increase until 2030 (AHA, 2021).

According to the World Health Organization (2021), cardiovascular disease has been the leading cause of death in the world for the last 20 years. Cardiovascular disease in the United States is the leading cause of death, with 874,613 deaths, 42.1% of which are caused by coronary heart disease (AHA, 2021). In Asia, cardiovascular disease causes 10.8 million deaths, which is about 35% of total deaths. From 1990 to 2019, the number of deaths from cardiovascular disease in Asia increased from 5.6 million to 10.8 million, and the proportion of deaths from cardiovascular disease in total deaths increased from 23% to 35% (Zhao, 2021). In addition, in Southeast Asia, cardiovascular disease accounts for almost one-third of all deaths (killing 4 million people each year) (World Heart Federation, 2021).

Data from Riskesdas (2018) revealed that in Indonesia there are at least 2,784,064 people suffering from heart disease. The prevalence of heart disease in Indonesia based on a doctor's diagnosis was found to be 1.5%. West Sumatra Province ranks 10th with the number of heart disease cases above the national average, namely 1.6%.

According to the WHO definition, cardiovascular disease is a disease caused by disorders of the heart and blood vessel function. One of the most common cardiovascular diseases and the highest cause of death is coronary heart disease (AHA, 2021). Coronary heart disease is caused by plaque formation in the walls of the coronary arteries. This plaque formation can disrupt blood flow that carries oxygen to the heart. If left untreated, the reduced oxygen supply to the heart can cause ischemia and even infarction. If infarction continues, it can cause ventricular muscle dysfunction and trigger heart failure (Ahmad et al., 2022).

Congestive Heart Failure (CHF), commonly known as heart failure, is a clinical syndrome characterized by the inability of the heart to pump enough blood to meet the oxygen and nutrient needs of body tissues. Heart failure can be marked by volume overload, inadequate tissue perfusion, and poor activity tolerance (Rogers, 2015). Heart failure is also defined as the inability of the heart to perform its tasks so that tissue and nutrient needs throughout the body are not met (Majid, 2018).

Data from the Global Health Data Exchange (GHDx) in 2020 shows that the number of heart failure cases worldwide reached 64.34 million cases with 9.91 million deaths, and an estimated 346.17 billion US Dollars spent on patient care (Lippi & Gomar, 2020). About 6.2 million adults in the United States experience heart failure, with a recorded mortality rate of 13.4% (379,800 people) (Centers for Disease Control and Prevention, 2021). In Indonesia, heart failure is the second leading cause of death after cancer (Mufarida, 2022).

Heart failure is a clinical syndrome caused by structural and functional abnormalities of the heart that affect the ability of the left ventricle to fill and pump blood adequately (Savarese et al., 2022). This results in decreased cardiac output, causing fatigue, dizziness, and the appearance of congestive symptoms (Simandalahi et al., 2019).

Heart failure also causes changes in neurohormonal regulation, which can affect hemodynamic status as seen from unstable vital signs such as respiratory rate, blood pressure, mean arterial pressure (MAP), heart rate, and oxygen saturation (Hsu et al., 2021). The term hemodynamics refers to blood flow in the circulatory system, both through systemic circulation (major circulation) and pulmonary circulation (minor circulation) (Jain & Borlaug, 2020). Under normal conditions, hemodynamics are maintained physiologically with neurohormonal control. However, in heart failure patients, this control mechanism does not function normally, resulting in unstable hemodynamic status (Hsu et al., 2021).

Hemodynamic instability greatly affects the oxygen delivery function in the body and involves heart function (Hsu et al., 2021). Hemodynamic instability in heart failure can cause a decrease in ejection fraction, acute to chronic disease, and cardiogenic shock. It can also cause disorders in pulmonary ventilation control and efficiency, pulmonary congestion, capillary pressure failure, pulmonary vascular disease, sodium and water retention, and deterioration of kidney function (Verbrugge et al., 2020).

According to Price & Wilson (2013), in heart failure patients, hemodynamic instability causes increased sympathetic nerve modulation and neurohormonal changes that tend to harm the patient. Increased sympathetic nerve modulation will increase blood pressure and heart rate, and if not corrected, will increase the heart's workload, which worsens the health status of heart failure patients (Khatib et al., 2017).

Proper monitoring and management are essential when hemodynamic disorders occur (Hsu et al., 2021). Unstable vital signs indicate hemodynamic disturbances (Alivian, 2018). Management is generally carried out pharmacologically to improve oxygenation by administering oxygen and reducing oxygen consumption through activity reduction, decreasing heart workload with vasodilators, and increasing myocardial contractility (Kalaivani, 2019). However, these drugs do not fully resolve the problem or repair the heart condition and still have side effects that can harm kidney function. Therefore, non-pharmacological therapy is needed as a complementary treatment (Simandalahi et al., 2019).

Several non-pharmacological management strategies can be carried out to improve hemodynamic status, such as positioning, breathing exercises, massage, meditation/yoga, and relaxation therapy. Positioning is the most common intervention in patients with unstable hemodynamic status because it is easy to do. However, it may cause discomfort if maintained too long (Setiyawan, 2016). Massage, meditation, and relaxation therapy can be alternatives, but they require a calm environment, concentration, and cannot be done independently (Alivian, 2018).

Breathing exercises can be another alternative to address hemodynamic instability. One breathing exercise that can be done is Alternate Nostril Breathing Exercise (Khatib et al., 2017). This exercise is easy to learn, cost-effective, and requires no equipment or significant time investment (Ghiya, 2017). Furthermore, it has no side effects but offers potential to reduce cardiovascular disease, thereby improving long-term outcomes and reducing healthcare costs (Chaddha, 2015).

Alternate Nostril Breathing Exercise (ANBE) involves inhaling through one nostril and exhaling through the other (Mooventhan & Nivethitha, 2017). This therapy is therapeutic, affects the circulatory and respiratory systems, and helps normalize and balance the pulse rate (Simandalahi et al., 2019). ANBE has many physiological, behavioral, and psychological benefits. Studies have shown its usefulness as a supplementary therapy alongside medical treatment for heart failure patients, helping stabilize symptoms, increase activity tolerance, improve cardiovascular endurance, cardiac function, autonomic function, quality of life, and reduce myocardial distress (Khatib et al., 2017).

Kalaivani (2019) found that ANBE significantly reduced pulse rate, systolic and diastolic blood pressure, and rate pressure product in hypertensive patients. Simandalahi et al. (2019) reported that ANBE significantly affects systolic blood pressure, diastolic blood pressure, heart rate, and respiration in heart failure patients. Chaddha (2015) also reported that ANBE can influence blood pressure, pulse rate, respiration, pain, anxiety, comfort, and oxygen saturation in heart failure patients.

The effectiveness of ANBE is linked to lung tissue stretching during inspiration, which stimulates slowly adapting stretch receptors (SARs) that inhibit signals and hyperpolarizing currents via fibroblast action to the cardio-inhibitory area in the medulla oblongata. This inhibitory process, involving the vagus nerve, activates the parasympathetic system. This autonomic balance shift to parasympathetic dominance increases baroreflex sensitivity, lowering blood pressure and heart rate significantly in heart failure patients (Uğur, 2020).

ANBE is also believed to reduce respiratory rate and increase oxygen saturation, thus alleviating dyspnea. Pulmonary stretch stimulation from lung inflation reflexively relaxes laryngeal and tracheobronchial smooth muscles, increases tidal volume, stimulates surfactant production, and enhances alveolar efficiency, improving gas exchange (Bargal et al., 2022).

Dhungel & Sohal (2013) reported a significant relationship between nasal cycles, cerebral dominance, and autonomic activity. Breathing through the right nostril activates the left cerebral hemisphere, increasing sympathetic stimulation, while breathing through the left nostril activates the right cerebral hemisphere, enhancing parasympathetic activity and promoting relaxation.

Suranata et al. (2019) further explained that left nostril breathing causes vasodilation in peripheral veins and arterioles, reducing heart rate and ventricular contraction, thereby lowering cardiac output and blood pressure.

Preliminary studies in the ICU of Pusri Hospital Palembang found 20 CHF cases between September–October 2023, with common problems including unstable hemodynamics, oxygen saturation issues, and shortness of breath. Current treatments are mainly pharmacological, with no non-pharmacological therapies implemented. Febtrina & Malfasari (2018) also noted that heart failure patients often experience unstable hemodynamics, with higher systolic blood pressure and heart rate, but lower MAP and oxygen saturation.

Hemodynamic monitoring is important to detect early signs of instability, as unstable vital signs indicate changes in tissue perfusion and cardiac contractility. In addition to vital signs, hemodynamic parameters must be assessed since changes in cardiac output reduce circulation. Because of this, the authors are interested in applying ANBE as an intervention to improve hemodynamic status in CHF patients.

## RESEARCH METHODS

This study applied a case study design involving two patients diagnosed with Congestive Heart Failure (CHF) and hemodynamic instability, treated in the Intensive Care Unit (ICU) of Pusri Hospital Palembang. The participants consisted of one male patient aged 58 years and one female patient aged 62 years. The study was conducted over a seven-day period, focusing on nursing assessment and the implementation of Alternate Nostril Breathing Exercise (ANBE).

The sampling technique used was purposive sampling, with inclusion criteria: (1) diagnosis of CHF based on medical records, (2) evidence of hemodynamic instability as indicated by abnormal vital signs, (3) conscious and able to follow instructions, and (4) willingness to participate in the intervention.

Data collection included direct observation and measurement of blood pressure, heart rate, respiratory rate, mean arterial pressure (MAP), and oxygen saturation before and after each ANBE session. The intervention was performed twice daily for 15 minutes per session over three consecutive days, supervised by a nurse.

Data analysis was conducted descriptively by comparing pre- and post-intervention hemodynamic parameters for each patient and summarizing the trends observed. Ethical approval was obtained from the hospital's ethics committee, and both participants provided informed consent..

## RESULTS AND DISCUSSION

In this chapter, the implementation of nursing care for clients diagnosed with congestive heart failure in the ICU of Pusri Hospital is described, covering the period from November 6, 2023, to November 18, 2023. The nursing care was carried out in stages, beginning with assessment, formulation of nursing problems, nursing planning, implementation, and evaluation of nursing actions, a process referred to as the nursing process. These stages are further elaborated in the following sections.

**Table 1. Characteristics of the Case Description**

| No. | Patient Name | Age | Blood Pressure | Pulse | RR | Temperature | O2 Saturasi | Date of Care |
|---|---|---|---|---|---|---|---|---|
| 1 | Mrs. S | 68 years | 140/100 | 142x/minutes | 35x/minutes | 36°C | 95% | 6-8 November 2023 |
| 2 | Mr. K | 70 years | 131/84 | 140x/minutes | 44x/minutes | 36°C | 95% | 15-18 November 2023 |

### Patient 1 (Mrs. S)

At home, the client lives with her child, son-in-law, and grandchildren. Whenever she feels unwell or experiences a recurrence of her heart condition, she is cared for and assisted by her child and son-in-law, either at home or in the hospital. The family stated that the client has had a history of heart disease and hypertension for the past three years. Both the client and her family understand heart disease and high blood pressure; however, they rarely take her for regular health check-ups due to their busy work schedules and lack of time. She is usually taken to the hospital only when she feels very weak or when symptoms worsen. They have received information about heart disease and hypertension from doctors and nurses during previous hospitalizations three years ago and seven months ago.

When she experiences shortness of breath, cold sweats, and palpitations, the client stops all activity and rests until she feels better. If she has a fever, the family buys medicine from a shop, and she usually recovers. However, the client often violates the doctor's dietary recommendations, eating without any restrictions, and the family does not prohibit her from eating anything unless symptoms appear.

At home, she is independent in her activities of daily living (ADLs) without assistance or aids—she can mobilize, ambulate, bathe, eat, and manage toileting independently. She still sweeps the yard, burns trash, feeds livestock, and sweeps the house. She can walk to the shop alone, although sometimes she feels short of breath and palpitations after walking far, which improves with rest. She does not follow a structured exercise program but walks around the yard, visits neighbors, or goes to the shop with her grandchildren. The risk of recurrence is high due to her lack of dietary control and infrequent health monitoring.

### Patient 2 (Mr. K)

Before falling ill, the client usually discussed problems with his family to find solutions. According to the family, he has had heart disease for about one year and was hospitalized for the same diagnosis around seven months ago. During assessment, he asked about his current condition, the expected length of hospitalization, and when he could be discharged. He expressed fear of sudden shortness of breath, chest pain, and palpitations. During hospitalization, he appeared anxious, grimaced in pain, and neither he nor his family knew how to manage pain independently.

He understands his condition and recognizes the symptoms of recurrence, such as chest pain and intermittent shortness of breath after work or daily activities. He usually buys ISDN medication from the pharmacy for relief, but if symptoms worsen, his family takes him to the hospital. He is aware that the disease is chronic and often recurs, as he has been hospitalized multiple times in the past year.

Symptom pattern: Symptoms appear during daily activities, including cold sweats, chest pain, shortness of breath, palpitations, and difficulty sleeping due to breathlessness. He often feels easily fatigued. His anxiety score was 30 (severe anxiety). Symptoms improve with rest and ISDN.

At first diagnosis, he tried to live healthily, hoping for full recovery, but later accepted that recurrences are likely due to aging. He still hopes to recover, relying on healthcare facilities, doctor consultations, and medical check-ups, with his last check-up in July 2023.

The client is grateful for strong family support, especially from his wife and children, who monitor his condition, buy medications, and care for him when symptoms worsen. Neighbors also visit him after hospital discharge, which motivates him to recover. Initially, he was saddened and feared death upon learning his diagnosis, but over time, he became more accepting—though he still fears recurrence. He believes his illness is part of God’s will but will make every effort to recover. He is willing to follow any treatment recommended, despite knowing full recovery is unlikely.

Based on the assessment findings of both patients, the identified nursing diagnoses were determined according to the priority problems encountered. The first diagnosis was decreased cardiac output, which was associated with changes in heart rhythm such as palpitations, tachycardia, arrhythmia, and altered afterload characterized by dyspnea. The second diagnosis was ineffective peripheral perfusion related to increased blood pressure. The third diagnosis was activity intolerance associated with weakness, while the fourth diagnosis was anxiety related to a situational crisis and the perceived threat of death.

The focus of this Ners scientific report is on maintaining hemodynamic stability in patients with congestive heart failure (CHF) through the implementation of the alternate nostril breathing exercise intervention. The nursing care was provided from November 6 to November 18, 2023. The implementation of the alternate nostril breathing exercise was carried out on November 8, 2023, for Patient 1 and on November 15, 2023, for Patient 2. The exercise was performed twice daily for a duration of 10–15 minutes. Observations were conducted over a period of two days.

**Table 2. Pre-test Implementation of Alternate Nostril Breathing Exercise for Mrs. S and Mr. K on Blood Pressure**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| **Intervention** | **Session I** | **Session II** | **Session I** | **Session II** |
| **Blood Pressure** | **Before** | **Before** | **Before** | **Before** |
| **Day-** | | | | |
| 1 | 148/101 | 139/100 | 155/112 | 141/104 |
| 2 | 136/100 | 130/100 | 147/109 | 139/100 |

Based on Table 2, it can be observed that in the pre-test phase, before the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the blood pressure was 148/101 mmHg, and during the second application, it was 139/100 mmHg. On the second day, during the first application, the blood pressure measured 136/100 mmHg, and during the second application, it decreased to 130/100 mmHg.

For Patient 2, on the first day of the first application, the blood pressure was recorded at 155/112 mmHg, and during the second application, it decreased to 141/104 mmHg. On the second day, the first application showed a blood pressure of 147/109 mmHg, which further decreased to 139/100 mmHg during the second application.

**Table 3. Post-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Blood Pressure**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| **Intervention** | **Session I** | **Session II** | **Session I** | **Session II** |
| **Blood Pressure** | **After** | **After** | **After** | **After** |
| **Day-** | | | | |
| 1 | 140/98 | 130/97 | 143/98 | 140/97 |

| | | | | |
|---|---|---|---|---|
| 2 | 132/98 | 125/90 | 140/96 | 132/89 |

Based on Table 3, it can be seen that in the post-test phase, after the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the blood pressure was 140/98 mmHg, and during the second application, it decreased to 130/97 mmHg. On the second day, the first application recorded a blood pressure of 132/98 mmHg, which further decreased to 125/90 mmHg during the second application.

For Patient 2, on the first day of the first application, the blood pressure was 143/98 mmHg, and during the second application, it slightly decreased to 140/97 mmHg. On the second day, the first application recorded a blood pressure of 140/96 mmHg, which further dropped to 132/89 mmHg during the second application.

**Table 4. Pre-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Respiratory Rate (RR)**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| **Intervention** | **Session I** | **Session II** | **Session I** | **Session II** |
| **Respiratory Rate (RR)** | **Before** | **Before** | **Before** | **Before** |
| **Day-** | | | | |
| 1 | 40 | 37 | 38 | 35 |
| 2 | 35 | 28 | 35 | 27 |

Based on Table 4, it can be observed that in the pre-test phase, before the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the respiratory rate was 40 breaths/minute, and during the second application, it decreased to 37 breaths/minute. On the second day, the first application recorded a respiratory rate of 35 breaths/minute, which further decreased to 28 breaths/minute during the second application.

For Patient 2, on the first day of the first application, the respiratory rate was 38 breaths/minute, and during the second application, it decreased to 35 breaths/minute. On the second day, the first application recorded a respiratory rate of 35 breaths/minute, which further dropped to 27 breaths/minute during the second application.

**Table 5. Post-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Respiratory Rate (RR)**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| **Intervention** | **Session I** | **Session II** | **Session I** | **Session II** |
| **Respiratory Rate (RR)** | **After** | **After** | **After** | **After** |
| **Day-** | | | | |
| 1 | 38 | 34 | 36 | 32 |
| 2 | 33 | 25 | 30 | 24 |

Based on Table 5, it can be observed that in the post-test phase, after the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the respiratory rate was 38 breaths/minute, and during the second application, it decreased to 34 breaths/minute. On the second day, the first application recorded a respiratory rate of 33 breaths/minute, which further decreased to 25 breaths/minute during the second application.

For Patient 2, on the first day of the first application, the respiratory rate was 36 breaths/minute, and during the second application, it decreased to 32 breaths/minute. On the second day, the first application recorded a respiratory rate of 30 breaths/minute, which further dropped to 24 breaths/minute during the second application.

**Table 6. Pre-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Heart Rate (HR)**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| **Intervention** | **Session I** | **Session II** | **Session I** | **Session II** |
| **Heart Rate (HR)** | **Before** | **Before** | **Before** | **Before** |
| **Day-** | | | | |
| 1 | 138 | 129 | 127 | 120 |
| 2 | 128 | 112 | 119 | 106 |

Based on Table 6, it can be seen that in the pre-test phase, before the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the heart rate was 138 beats/minute, and during the second application, it decreased to 129 beats/minute. On the second day, the first application recorded a heart rate of 128 beats/minute, which further decreased to 112 beats/minute during the second application.

For Patient 2, on the first day of the first application, the heart rate was 127 beats/minute, and during the second application, it decreased to 120 beats/minute. On the second day, the first application recorded a heart rate of 119 beats/minute, and during the second application, it further dropped to 106 beats/minute.

**Table 7. Post-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Heart Rate (HR)**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| Intervention | Session I | Session II | Session I | Session II |
| Heart Rate (HR) | After | After | After | After |
| Day- | | | | |
| 1 | 130 | 127 | 124 | 117 |
| 2 | 116 | 104 | 110 | 98 |

Based on Table 7, it can be observed that in the post-test phase, after the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the heart rate was 130 beats/minute, and during the second application, it slightly decreased to 127 beats/minute. On the second day, the first application recorded a heart rate of 116 beats/minute, which further decreased to 104 beats/minute during the second application.

For Patient 2, on the first day of the first application, the heart rate was 124 beats/minute, and during the second application, it decreased to 117 beats/minute. On the second day, the first application recorded a heart rate of 110 beats/minute, and during the second application, it further dropped to 99 beats/minute.

**Table 8. Pre-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Body Temperature**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| Intervention | Session I | Session II | Session I | Session II |
| Body Temperature (°C) | Before | Before | Before | Before |
| Day- | | | | |
| 1 | 36,7 | 36 | 35,8 | 36 |
| 2 | 36,3 | 36,2 | 35,7 | 36,5 |

Based on Table 8, it can be observed that in the pre-test phase before the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the body temperature was 36.7°C, while in the second application it decreased to 36.0°C. On the second day, the first application recorded a body temperature of 36.3°C, which slightly decreased to 36.2°C in the second application.

For Patient 2, on the first day of the first application, the body temperature was 35.8°C, and in the second application, it increased to 36.0°C. On the second day, the first application recorded a body temperature of 35.7°C, and in the second application, it increased to 36.5°C.

**Table 9. Post-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Body Temperature**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| Intervention | Session I | Session II | Session I | Session II |
| Body Temperature (°C) | After | After | After | After |
| Day- | | | | |
| 1 | 36 | 36,1 | 36 | 36,5 |
| 2 | 35,8 | 36,4 | 36,3 | 36 |

Based on Table 9, it can be observed that in the post-test phase after the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the body temperature was 36.0°C, and in the second application, it slightly increased to 36.1°C. On the second day, the first application recorded a body temperature of 35.8°C, which then increased to 36.4°C in the second application.

For Patient 2, on the first day of the first application, the body temperature was 36.0°C, and in the second application, it increased to 36.5°C. On the second day, the first application recorded a body temperature of 36.3°C, while in the second application, it slightly decreased to 36.0°C.

**Table 10. Pre-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Oxygen Saturation**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| Intervention | Session I | Session II | Session I | Session II |
| Oxygen Saturation ($SpO_2$) | Before | Before | Before | Before |
| Day- | | | | |
| 1 | 92 | 95 | 93 | 95 |
| 2 | 94 | 93 | 94 | 94 |

Based on Table 10, it can be seen that in the pre-test phase before the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the oxygen saturation level was 92%, and in the second application, it increased to 95%. On the second day, the first application recorded an oxygen saturation of 94%, followed by a slight decrease to 93% in the second application.

For Patient 2, on the first day of the first application, the oxygen saturation level was 93%, increasing to 95% in the second application. On the second day, both the first and second applications recorded the same oxygen saturation level of 94%.

**Table 11. Post-test of Alternate Nostril Breathing Exercise Implementation on Mrs. S and Mr. K Related to Oxygen Saturation ($SpO_2$)**

| Name | Mrs. S | | Mr.K | |
|---|---|---|---|---|
| Intervention | Session I | Session II | Session I | Session II |
| Oxygen Saturation ($SpO_2$) | After | After | After | After |
| Day- | | | | |
| 1 | 96 | 97 | 95 | 97 |
| 2 | 98 | 98 | 96 | 98 |

Based on Table 11, it can be seen that in the post-test phase after the implementation of the alternate nostril breathing exercise for Patient 1, on the first day of the first application, the oxygen saturation level was 96%, which increased to 97% in the second application. On the second day, both the first and second applications showed an oxygen saturation level of 98%.

For Patient 2, on the first day of the first application, the oxygen saturation level was 95%, increasing to 97% in the second application. On the second day, the oxygen saturation level rose to 96% in the first application and reached 98% in the second application.

The number of congestive heart failure (CHF) cases in the ICU of PUSRI Hospital was 114 patients in 2022, with 17 cases reported in September 2023. The phenomenon of heart failure is caused by several conditions that are often unknown to the surrounding community. Common causes of heart failure include lifestyle factors such as lack of exercise, active smoking, high stress levels, frequent consumption of fast food or junk food without balancing it with nutritious meals. If CHF is not promptly treated or controlled, it can lead to worsening cardiac function, reduced heart pumping ability, and symptoms such as swelling in the extremities or organs, shortness of breath, and even death.

Common problems experienced by CHF patients include chest pain and shortness of breath. Chest pain in CHF patients is often caused by a reduced oxygen supply to the myocardium, leading to cardiac cell death. Meanwhile, shortness of breath is caused by structural and functional abnormalities of the heart, which impair ventricular function in meeting the body’s nutritional and oxygen needs.

**Patient 1 (Mrs. S)**

Based on the assessment, the patient's family stated that the patient had been experiencing shortness of breath during daily activities for approximately two days before hospital admission. The patient also complained of chest tightness, palpitations, discomfort in the upper abdomen, cold sweats, and nausea. These symptoms worsened after normal activities such as sweeping the house and washing dishes. The patient had taken over-the-counter Paramex medication, but subsequently experienced increased palpitations, shortness of breath, and cold sweats since the morning.

At home, the patient lives with her children, in-laws, and grandchildren. When she feels unwell or has a cardiac episode, her children and in-laws provide care both at home and in the hospital. The family reported that the patient has had a history of heart disease and hypertension for the past three years. Both the patient and her family understand the nature of these conditions, but the family rarely takes her for check-ups due to being busy with work. She is only taken to the hospital when symptoms become severe. They previously received information about heart disease and hypertension from doctors and nurses during hospitalizations three years ago and seven months ago.

When experiencing shortness of breath, cold sweats, and palpitations, the patient rests and stops all activities until she feels comfortable. If she develops a fever, her family buys over-the-counter medicine from a shop, which usually resolves the symptoms. However, her adherence to dietary restrictions is poor; she eats normally without specific diet control, and her family does not restrict her food intake unless she shows signs of illness.

The family and patient seek information about her condition from community health centers and doctors to learn about further management. When given treatment instructions, the patient generally follows them until her symptoms disappear. During the rehabilitation period after a heart attack, she maintains a healthy diet as recommended by the doctor, but only until she feels no longer ill.

**Patient 2 (Mr. K)**

Before becoming ill, the patient would always discuss problems with his family to find solutions. The family stated that the patient has had a history of heart disease for about one year and was hospitalized with the same diagnosis around seven months ago. During the assessment, he asked about his current condition, length of hospital stay, and when he could go home. He expressed fear of sudden shortness of breath, chest pain, and palpitations. Throughout hospitalization, he appeared anxious, grimacing in pain, and both the patient and his family were unaware of how to manage pain independently.

The patient recognizes his symptoms, such as intermittent chest pain and shortness of breath after work or daily activities. For treatment, he usually buys ISDN medication from the pharmacy. If symptoms worsen or persist, his family takes him to the hospital. He is aware that his illness will not be easily cured and has had frequent recurrences over the past year, requiring repeated hospitalizations. During daily activities, he often experiences cold sweats, chest pain, shortness of breath, palpitations, difficulty sleeping due to breathlessness, and fatigue. Anxiety level: 30 (severe anxiety). Symptoms are relieved with rest and ISDN.

Initially, after his diagnosis one year ago, the patient tried to maintain a healthy lifestyle and hoped for a complete recovery. However, he later accepted that his heart condition would frequently relapse because it is no longer as strong as it was in his youth. His sources of support include hospital care, doctor consultations, and health check-ups. His last check-up was in July 2023. He expressed gratitude for the support of his extended family, wife, and children, who regularly monitor his condition and help with care at home. Neighbors also visit and provide encouragement after hospital discharge.

When first informed of his illness, the patient was deeply saddened and afraid of death. Over time, he began to accept his condition but still fears recurrent episodes. He knows that his illness is difficult to cure and that relapses are likely if he overexerts himself. During severe episodes of chest pain and shortness of breath, he feels as though death is imminent. He has since tried to live a healthier lifestyle and rests when feeling easily fatigued. He accepts his illness as God's will but remains determined to recover, believing that maintaining a healthy lifestyle and following all necessary treatments might help him regain his health.

Based on the results of the application of evidence-based nursing, namely the intervention of Alternate Nostril Breathing Exercise (ANBE) given twice a day for a duration of 10–15 minutes, it was found that in the application of ANBE on blood pressure, respiratory rate, heart rate, and oxygen saturation, there were differences before and after in the two patients. However, for body temperature, there was no significant effect, as there was no difference during the 2 days of ANBE administration, and all values remained within normal limits.

In the pre-test phase, before the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed blood pressure of 148/101 mmHg, and the second application showed 139/100 mmHg. On day 2, the first application showed 136/100 mmHg, and the second application showed 130/100 mmHg. For patient 2, on day 1 the first application showed 155/112 mmHg, and the second application showed 141/104 mmHg. On day 2, the first application showed 147/109 mmHg, and the second application showed 139/100 mmHg.

In the post-test phase, after the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed blood pressure of 140/98 mmHg, and the second application showed 130/97 mmHg. On day 2, the first application showed 132/98 mmHg, and the second application showed 125/90 mmHg. For patient 2, on day 1 the first application showed 143/98 mmHg, and the second application showed 140/97 mmHg. On day 2, the first application showed 140/96 mmHg, and the second application showed 132/89 mmHg.

In the pre-test phase, before the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a respiratory rate of 40 times/minute, and the second application showed 37 times/minute. On day 2, the first application showed 35 times/minute, and the second application showed 28 times/minute. For patient 2, on day 1 the first application showed 38 times/minute, and the second application showed 35 times/minute. On day 2, the first application showed 35 times/minute, and the second application showed 27 times/minute.

In the post-test phase, after the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a respiratory rate of 38 times/minute, and the second application showed 34 times/minute. On day 2, the first application showed 33 times/minute, and the second application showed 25 times/minute. For patient 2, on day 1 the first application showed 36 times/minute, and the second application showed 32 times/minute. On day 2, the first application showed 30 times/minute, and the second application showed 24 times/minute.

In the pre-test phase, before the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a heart rate of 138 times/minute, and the second application showed 129 times/minute. On day 2, the first application showed 128 times/minute, and the second application showed 112 times/minute. For patient 2, on day 1 the first application showed 127 times/minute, and the second application showed 120 times/minute. On day 2, the first application showed 119 times/minute, and the second application showed 106 times/minute.

In the post-test phase, after the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a heart rate of 130 times/minute, and the second application showed 127 times/minute. On day 2, the first application showed 116 times/minute, and the second application showed 104 times/minute. For patient 2, on day 1 the first application showed 124 times/minute, and the second application showed 117 times/minute. On day 2, the first application showed 110 times/minute, and the second application showed 99 times/minute.

In the pre-test phase, before the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a body temperature of 36.7℃, and the second application showed 36℃. On day 2, the first application showed 36.3℃, and the second application showed 36.2℃. For patient 2, on day 1 the first application showed 35.8℃, and the second application showed 36℃. On day 2, the first application showed 35.7℃, and the second application showed 36.5℃.

In the post-test phase, after the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed a body temperature of 36℃, and the second application showed 36.1℃. On day 2, the first application showed 35.8℃, and the second application showed 36.4℃. For patient 2, on day 1 the first application showed 36℃, and the second application showed 36.5℃. On day 2, the first application showed 36.3℃, and the second application showed 36℃.

In the pre-test phase, before the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed an oxygen saturation of 92%, and the second application showed 95%. On day 2, the first application showed 94%, and the second application showed 93%. For patient 2, on day 1 the first application showed 93%, and the second application showed 95%. On day 2, the first application showed 94%, and the second application showed 94%.

In the post-test phase, after the implementation of the alternate nostril breathing exercise intervention for patient 1, on day 1 the first application showed an oxygen saturation of 96%, and the second application showed 97%. On day 2, the first application showed 98%, and the second application showed 98%. For patient 2, on day 1 the first application showed 95%, and the second application showed 97%. On day 2, the first application showed 96%, and the second application showed 98%.

Hemodynamic instability will greatly affect the function of oxygen delivery throughout the body, which will in turn affect heart function. Hemodynamic instability in heart failure patients can lead to the development of abnormalities in pulmonary ventilation control and efficiency, pulmonary congestion, capillary pressure failure, pulmonary vascular disease, sodium and water retention, as well as worsening kidney function. Hemodynamic instability will also lead to increased sympathetic nerve modulation and neurohormonal changes that are detrimental to heart failure patients. Increased sympathetic nerve modulation will increase blood pressure and heart rate, and if there is no improvement, it will result in increased cardiac workload and further deterioration of the health status of heart failure patients (Inawijaya et al., 2023).

Royani et al. (2023) stated that physical condition or athletic performance will improve as a response to repeated and regular physical activity, due to the cardiovascular and respiratory systems becoming more efficient in transporting $O_2$ and $CO_2$. After engaging in physical activity, vital capacity (VC) will slightly increase and residual volume will slightly decrease, whereas during intense physical activity, volume will increase. Aside from physical activity influencing respiratory rate (RR), the health condition of the two respondents, especially in the cardiovascular system, has a significant correlation with pulmonary function parameter values.

Proper monitoring and management are essential when hemodynamic disturbances occur. The profile of unstable vital signs is an indication of hemodynamic disturbance. Management can be carried out pharmacologically to improve oxygenation by providing oxygen and reducing activity, reducing cardiac workload, and increasing myocardial contractility through medication. However, pharmacological treatment alone will not fully resolve the issue or improve heart condition, and continuous use of medication may also burden kidney function. Therefore, non-pharmacological therapy is also needed as an adjunct to medical treatment for heart failure patients (Novitasari et al., 2023).

## CONCLUSION

The results of the intervention indicate that the implementation of alternate nostril breathing exercises had a positive impact on both patients' physiological parameters. In the pre-test phase, body temperatures for both patients showed slight variations and tended to be within the lower to normal range. After the intervention (post-test), there was a tendency for body temperature to stabilize within a normal range for both patients.

Similarly, oxygen saturation levels in the pre-test phase were generally within the lower normal limit, with values ranging from 92% to 95% for patient 1 and 93% to 95% for patient 2. Following the intervention, oxygen saturation improved and consistently reached higher normal levels, ranging from 96% to 98% for patient 1 and 95% to 98% for patient 2.

Overall, these findings suggest that alternate nostril breathing exercises may contribute to improving oxygen saturation and stabilizing body temperature, which could support better respiratory function, enhanced oxygen delivery to tissues, and overall physiological balance. The results indicate potential clinical benefits, making this intervention a non-invasive, simple, and cost-effective technique to support patient recovery.

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