NON-PHARMACOLOGICAL MANAGEMENT OF CHF PATIENTS USING A COMBINATION OF ALTERNATE NOSTRIL BREATHING EXERCISES AND THE SEMI FOWLER POSITION TO IMPROVE RESPIRATORY PATTERNS

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ABSTRACT

Congestive Heart Failure (CHF) is a clinical condition in which the heart is unable to pump enough blood to meet the metabolic needs of the body. The most common clinical manifestations in CHF patients are abnormal breathing patterns, including shortness of breath and increased respiratory rate due to excessive pulmonary blood volume and decreased ventilation efficiency. A non-pharmacological management approach that can be applied to improve the breathing pattern of CHF patients is the practice of Alternate Nostril Breathing combined with a semi Fowler's position. The aim of this study is to determine the effectiveness of Alternate Nostril Breathing and the semi-Fowler's position in improving the breathing pattern in CHF patients. The research method used is a Pre Experimental design through a One-Group Pretest-Posttest model with a sample of 35 respondents. The results indicate that H_o is rejected and Ha is accepted, leading to the conclusion that the implementation of Alternate Nostril Breathing Exercise with the Semi Fowler position affects changes in the breathing pattern of CHF patients. The conclusion of this study is that the application of Alternate Nostril Breathing Exercise with the Semi Fowler position has a significant effect on changes in the breathing pattern of CHF patients. This intervention can be considered as one of the non-pharmacological complementary therapies in nursing care for CHF patients to improve their breathing patterns.

KEYWORDS

Alternate Nostril Breathing Exercise, Semi-Fowler Position, Non-Pharmacological Management, Breathing Pattern, Congestive Heart Failure (CHF)

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INTRODUCTION

Congestive Heart Failure (CHF) or congestive heart failure is a complex clinical syndrome resulting from structural or functional disturbances in ventricular filling or blood ejection. This condition causes the heart to be unable to pump enough blood to meet the body's metabolic needs (Hinkle & Cheever, 2018). Globally, CHF remains one of the leading causes of morbidity and mortality, with prevalence continuing to rise alongside an aging population and high cardiovascular risk factors such as hypertension and coronary heart disease (American Heart Association, 2022).

The most common clinical manifestations reported by patients with Congestive Heart Failure (CHF) are shortness of breath (dyspnea) and fatigue (Coppiano et al., 2026). Dyspnea in CHF patients occurs due to pulmonary congestion (fluid accumulation in the alveoli) caused by the left ventricle's failure to adequately empty blood (Malik et al., 2022). This triggers disturbances in oxygenation and changes in breathing patterns to become rapid and shallow or tachypnea (Rahmawati et al., 2026). If this ineffective breathing pattern is left untreated, patients are at risk of severe tissue hypoxia, decreased quality of life, increased readmission rates, and even death (Gauer et al., 2025).

Management of patients with CHF generally focuses on pharmacological therapy to reduce the workload of the heart. However, non-pharmacological interventions also play a crucial role as complementary nursing therapies that have minimal side effects and are cost-effective. One physical intervention that is often applied in clinical areas is the semi-Fowler position (Muzaki, 2020). Positioning patients with a bed incline of 30-45 degrees has been anatomically proven to utilize gravitational forces to lower the diaphragm (Yuliani, 2020). This maximizes lung expansion, facilitates gas exchange, and reduces venous return, which can ultimately alleviate the heart's workload and relieve shortness of breath (Aini et al., 2018).

Although the semi-Fowler position is mechanically effective in maximizing chest wall expansion and reducing shortness of breath (Majampoh et al., 2020), optimizing vital lung capacity and regulating the autonomic nervous system requires additional approaches based on breathing exercises (Anisa, 2025; Wijayati et al., 2019). The Alternate Nostril Breathing Exercise, known as Nadi Shodhana Pranayama, is a rhythmic breathing technique that alternates between the right and left nostrils (Villani, 2023). This exercise works by stimulating parasympathetic nerve activity through vagus nerve activation, which results in decreased heart rate, stabilized blood pressure, and relaxation of the respiratory muscles (Permata et al., 2021). Through the Alternate Nostril Breathing Exercise, patients are trained to breathe more slowly, deeply, and regularly, thus improving alveolar ventilation and significantly reducing the breathing rate (Sari et al., 2023).

The combination of semi-Fowler position intervention and Alternate Nostril Breathing Exercise is expected to provide maximal changes in improving the breathing pattern of CHF patients. The combination of both can stabilize the autonomic nervous system, thereby reducing the respiratory rate and optimally increasing oxygen saturation compared to providing either of the two therapies alone. Based on the above urgency, this study was conducted to analyze the effect of the combination of Alternate Nostril Breathing Exercise and Semi Fowler position on changes in the breathing pattern of CHF patients.

RESEARCH METHOD

This research employs an experimental research method. The experimental method is included in quantitative research with a Pre-Experimental design using the One-Group Pretest-Posttest Design model. The sample of this study consists of patients with Congestive Heart Failure (CHF), with the sample size determined using a sampling approach based on Cohen's method. The total sample used is 35 respondents. The sampling technique employed is purposive sampling, with certain considerations based on the established inclusion and exclusion criteria.

The inclusion criteria established are: 1) Patients with a medical diagnosis of Congestive Heart Failure (CHF) with or without complications; 2) No decrease in consciousness; 3) Age ≥18 years; 4) Cooperative patients; 5) Oxygen saturation <95%; 6) Respiratory rate <24 breaths/minute; 7) Willing to be respondents and sign informed consent. Meanwhile, the exclusion criteria established include: 1) Patients with a non-rebreathing mask (NRM) or ventilator; 2) Patients refusing to participate in the study; 3) Patients using a nasogastric tube (NGT); 4) Not completing the intervention according to the research protocol.

The instruments used consist of observation sheets and standardized instruments tailored to the research objectives. The measurement instrument for breathing patterns in this study is an observation sheet used to assess changes in breathing patterns before and after the intervention of Alternate Nostril Breathing Exercise and the Semi Fowler position. Assessment is performed by measuring the patient's respiratory rate for one minute using a stopwatch, and then the results are categorized on an ordinal scale based on levels, specifically, bradypnea (24 breaths/minute). The procedures for Alternate Nostril Breathing Exercise and the Semi Fowler position use the SOP that has been approved by the health committee.

RESULT AND DISCUSSION

The purpose of this study is to determine the effectiveness of the Alternate Nostril Breathing Exercise in the Semi Fowler position on changes in breathing patterns in patients with Congestive Heart Failure (CHF), with a sample of 35 respondents meeting the inclusion criteria. The characteristics of the respondents were analyzed to provide an overview of the conditions of the respondents who were subjects of the study. The analyzed characteristics include age, gender, education, occupation, duration of suffering from Congestive Heart Failure (CHF), and blood pressure.

1. Distribution of Respondent Characteristics

Table 1. Distribution of Respondent Characteristics

Age (year)	n	%
25-44	2	5,7
45-59	16	45,7
> 60	17	48,6
Total	35	35

The majority of patients in this study were over 60 years old, accounting for 48.6%. This result indicates that congestive heart failure (CHF) is more common in the elderly population. Aging leads to changes in the structure and function of the cardiovascular system, such as reduced elasticity of blood vessels, decreased myocardial contractility, and an increased likelihood of developing high blood pressure and coronary artery disease, which can result in heart failure (Lakatta, 2015; Strait &

Lakatta, 2012). These findings are consistent with research (Murda et al., 2023) stating that age is one of the factors associated with the occurrence of CHF.

As age increases, so does the likelihood of experiencing heart failure due to changes in the heart and blood vessel systems, along with the emergence of comorbid conditions such as high blood pressure and coronary artery disease. This aligns with research conducted by (Rahawarin et al., 2025), which states that the majority of heart failure patients are over 60 years old, totaling 37 patients or 50%. This indicates that cases of heart failure are more frequent among the elderly.

2. Distribution of Respondents by Gender

Table 2. Distribution of Respondents by Gender

Gender	n	%
Male	26	74,3
Woman	9	25,7
Total	35	100

In Table 2, it is shown that the majority of respondents in this study are male, with a total of 26 respondents (7.43%), while the number of female respondents is only 9 (25.7%). These findings indicate that there are more patients with Congestive Heart Failure (CHF) in this study who are male. Men tend to have a higher likelihood of experiencing Congestive Heart Failure (CHF) compared to women, as they more frequently have cardiovascular risk factors such as hypertension, smoking habits, dyslipidemia, and coronary artery disease.

Additionally, the estrogen hormone that women have before menopause provides protection to the cardiovascular system, resulting in a relatively lower likelihood of heart failure. Supported by research conducted by (Utami & Pratiwi, 2021), which shows that men experience heart failure more often due to higher exposure to risks and unhealthy lifestyle patterns.

3. Distribution of Respondents Based on Duration of Illness

Table 3. Distribution of Respondents Based on Duration of Illness

Long Suffering from CHF	n	%
<1 year	5	14,3
1 – 5 year	28	80
>5 year	2	5,7
Total	35	100

The majority of respondents had been living with Congestive Heart Failure (CHF) for between 1 and 5 years, comprising 28 people (80%). Meanwhile, 5 people (14.3%) had experienced CHF for less than 1 year, and 2 people (5.7%) had suffered from CHF for more than 5 years. These findings indicate that most respondents in this study had been living with Congestive Heart Failure (CHF) for between 1 and 5 years. The duration of living with CHF reflects the chronic nature of the disease, which can affect patients' clinical condition, including the development of complaints of breathlessness and disturbed breathing patterns caused by reduced cardiac function and pulmonary congestion (Sastianingsih et al., 2024; Setianingsih & Hastuti, 2022).

4. Frequency Distribution of Breathing Patterns Before the Intervention (Pre-test)

Table 4. Frequency Distribution of Breathing Patterns Before the Intervention (Pre-test)

Respiratory Rate	n	%
Bradypnoea <16 breaths/minute	0	0
Normal: 16–24 breaths/minute	0	0
Tachypnoea >24 breaths/minute	35	100
Total	35	100

Based on Table 4, it can be seen that before the Alternate Nostril Breathing Exercise was administered in the Semi-Fowler position, all 35 respondents fell into the tachypnoea category (>24 breaths/minute). No respondents were classified as having a normal respiratory rate or bradypnoea. This finding indicates that, before the intervention was administered, all respondents experienced an increased respiratory rate in accordance with the inclusion criteria established by the researcher.

In patients with Congestive Heart Failure (CHF), tachypnoea occurs as a result of reduced blood flow, which causes an insufficient oxygen supply to the tissues. This leads to fluid accumulation in the lungs, impairing gas exchange; consequently, the body responds by increasing the respiratory rate as a compensatory effort to meet its oxygen requirements (Novitasari et al., 2023).

5. Frequency Distribution of Breathing Patterns After the Intervention (Post-test)

Table 5. Frequency Distribution of Breathing Patterns After the Intervention

Respiratory Rate	n	%
Bradypnoea <16 breaths/minute	0	0
Normal: 16–24 breaths/minute	21	60
Tachypnoea >24 breaths/minute	14	40
Total	35	100

The table above shows that after the administration of the Alternate Nostril Breathing Exercise in the Semi-Fowler position, the majority of respondents fell within the normal category (16–24 breaths/minute), namely 21 respondents (60%), while 14 respondents (40%) remained in the tachypnoea category (>24 breaths/minute). No respondents fell within the bradypnoea category (<16 breaths/minute). These findings indicate an improvement in the respiratory rate category after the intervention was administered.

These findings demonstrate an improvement in respiratory rate following the administration of the Alternate Nostril Breathing Exercise in the Semi-Fowler position. The increased number of participants with a normal respiratory rate indicates that the method applied helped improve breathing patterns in patients with CHF. However, 14 respondents (40%) were still classified as tachypnoeic. This does not necessarily mean that the method failed to produce any change, as individual measurements showed that some participants experienced a reduction in respiratory rate after undergoing the intervention.

This condition indicates that responses to the intervention varied between respondents, given that changes in respiratory rate may be influenced by physiological factors, the severity of the CHF, and the body's ability to adapt to the intervention provided. In line with research conducted by (Misyadi et al., 2023), the application of the Semi-Fowler position in patients with CHF can improve respiratory rate and maintain oxygen saturation levels, as this position supports lung expansion and reduces the workload involved in breathing.

6. The Effect of Alternate Nostril Breathing Exercises in the Semi-Fowler Position on Respiratory Rate

Table 6. Results of the Test on the Effect of Alternate Nostril Breathing Exercise in the Semi-Fowler Position on Respiratory Rate

Measurement	Negative Ranks	Positive Ranks	Ties	Z	Asymp.Sig.(2-tailed)
Pretest - Posttest	21	0	14	- 4.359	<, 001

The results of the Wilcoxon Signed Rank Test showed that 21 respondents (negative ranks) experienced a decrease in respiratory rate after the administration of the Alternate Nostril Breathing Exercise in the Semi Fowler position, no respondents experienced an increase in respiratory rate (positive ranks), and 14 respondents experienced no change in respiratory rate (ties). The statistical test produced a Z value of -4.359 with an Asymp. Sig. (2-tailed) value of p=0.001. This significance value was lower than 0.05 (p<0.05); therefore, H_0 was rejected and H_1 was accepted. Thus, there was a difference in breathing patterns before and after the Alternate Nostril Breathing Exercise in the Semi-Fowler position among patients with Congestive Heart Failure (CHF).

Pathophysiologically, individuals with CHF experience impaired cardiac pump function, resulting in a reduced ability of the heart to meet the body's metabolic demands. In heart failure, increased pressure in the left ventricle can trigger a rise in pressure within the pulmonary circulation, thereby causing pulmonary congestion. This congestion is associated with clinical symptoms such as breathing difficulties and activity intolerance due to impaired cardiopulmonary function (Bozkurt et al., 2021). Pulmonary congestion in patients with CHF can lead to higher pressure in the pulmonary blood vessels and disrupt the gas exchange process. This situation causes patients to work harder when breathing as a compensatory effort, which can result in an increased respiratory rate or tachypnoea. This symptom is often observed in individuals with heart failure due to a mismatch between the body's oxygenation needs and its ability to maintain adequate oxygenation levels (Bozkurt et al., 2021).

The application of the Alternate Nostril Breathing Exercise is a method involving the alternating regulation of inhalation and exhalation. The purpose of this breathing exercise is to help patients manage their breathing patterns in a regular manner. The results of a study by Novitasari et al. (2023) showed that the use of Alternate Nostril Breathing Exercise in patients with Congestive Heart Failure (CHF) had a significant effect on reducing respiratory rate, with a value of p=0.001 (p<0.05). These findings demonstrate that Alternate Nostril Breathing Exercise can be used as an independent nursing intervention to help improve impaired breathing patterns in patients with CHF. Thus, the researchers concluded that combining the Alternate Nostril Breathing Exercise with the Semi-Fowler position helps improve the breathing of patients suffering from Congestive Heart Failure (CHF). The Alternate Nostril Breathing Exercise helps patients regulate their breathing through guided breathing exercises, while the Semi Fowler position provides comfort and supports the patients' breathing process. However, each patient may respond differently to the intervention, as responses are influenced by their health condition, the severity of their heart disease, and their individual ability to adapt.

CONCLUSION

This study shows that the majority of patients with Congestive Heart Failure (CHF) were older adults aged over 60, male, and had a history of illness lasting 1–5 years. Before the intervention was administered, most patients experienced tachypnoea (>24 breaths/minute). However, following the implementation of the Alternate Nostril Breathing Exercise in the Semi-Fowler position, there was a significant improvement in breathing patterns, which reached the normal category (16–24 breaths/minute). Based on the Wilcoxon Signed-Rank Test (p <0.001), it can be concluded that the Alternate Nostril Breathing Exercise in the Semi-Fowler position was effective and had a significant effect on improving the breathing patterns of patients with CHF. Therefore, this intervention can be implemented as a safe non-pharmacological complementary therapy for patients with CHF, both in hospitals and independently at home.

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