

## Improving Oxygen Saturation in Congestive Heart Failure Patients Through the Semi-Fowler Position: A Case Study at Prof. Dr. Margono Soekarjo Hospital

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### ABSTRACT

Background: Congestive Heart Failure (CHF) often results in impaired oxygenation and shortness of breath due to reduced cardiac output and pulmonary congestion. One non-pharmacological intervention to improve oxygenation is the semi-Fowler position. Objective: To explore the effect of the semi-Fowler position on oxygen saturation in a CHF patient. Methods: This is a single case study conducted in the Alamanda Room of Prof. Dr. Margono Soekarjo Hospital. Nursing care was provided using the nursing process framework. Oxygen saturation was monitored over three days while applying the semi-Fowler position intervention. Results: The patient, Mr. L, a 58-year-old male with a diagnosis of Congestive Heart Failure, presented with shortness of breath, a respiratory rate of 27 breaths per minute, and an oxygen saturation (SpO<sub>2</sub>) level of 94% on room air. He was given oxygen therapy through a nasal cannula and was positioned in a semi-Fowler position consistently. On the first day of intervention, his SpO<sub>2</sub> increased to 96% and respiratory rate slightly decreased to 26 breaths per minute, with the patient reporting mild relief in dyspnea. On the second day, SpO<sub>2</sub> rose to 98% with oxygen reduced to 3 L/min, and respiratory rate decreased to 24 breaths per minute. The patient reported no shortness of breath unless oxygen was removed. By the third day, his SpO<sub>2</sub> was maintained at 98% on room air, respiratory rate further decreased to 23 breaths per minute, and breath sounds were clear without wheezing. The patient's dyspnea had completely resolved. Conclusion: The semi-Fowler position may help increase oxygen saturation and reduce respiratory distress in CHF patients.

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### INTRODUCTION

Congestive Heart Failure (CHF) is a clinical syndrome in which the heart is unable to pump blood effectively to meet the body's metabolic demands. It leads to a reduction in cardiac output and oxygen delivery to tissues, often resulting in dyspnea, orthopnea, fatigue, and pulmonary congestion (Berman et al., 2016).

Dyspnea in CHF is frequently worsened by lying flat due to fluid redistribution to the lungs. The semi-Fowler position (30°–45° upright) helps improve lung expansion and oxygenation by decreasing venous return and reducing pressure on the diaphragm (El-Moaty et al., 2017; Wijayati et al., 2019).

This paper presents a case study exploring the effectiveness of the semi-Fowler position in improving oxygen saturation in a CHF patient.

## METHOD

This case study used a descriptive nursing process approach, including assessment, nursing diagnosis, planning, implementation, and evaluation. Data were collected through observation and patient interview. Vital signs, respiratory status, and oxygen saturation were monitored. The semi-Fowler position (30°–45° elevation of head and upper torso) was applied consistently. Evaluation was documented using the SOAPIER format.

## RESULTS

### Assesment

Mr. L, a 58-year-old male living with his wife and three children and employed at a private company, presented to the Emergency Room of Prof. Dr. Margono Soekarjo Hospital on April 6, 2025, at 20:30 WIB with complaints of shortness of breath for five days, accompanied by nausea (without vomiting) and chest pain. On April 7, 2025, at 03:42 WIB, he was transferred to the Alamanda room. Assessment revealed complaints of shortness of breath and epigastric pain, which worsened with strenuous activity. The pain was described as stabbing, with a pain scale of 5 (0–10). Vital signs were: blood pressure 145/70 mmHg, pulse 80/min, temperature 36.7°C, respiration rate 27/min, and SpO<sub>2</sub> 96%. The patient received an NACL infusion at 12 tpm and oxygen via nasal cannula at 5 L/min.

### Diagnosis

Based on the assessment and anamnesis, the nursing diagnosis established was Ineffective Breathing Pattern (SDKI D.0005). The focus of care was to address and improve the patient's breathing pattern.

### Intervention

The nursing care plan included monitoring vital signs, especially respiratory status; positioning the patient in a 15-degree semi-Fowler position to enhance comfort and lung expansion; and collaborating with physicians for oxygen administration to optimize oxygen delivery.

### Implementation

Nursing interventions were implemented according to the Indonesian Nursing Intervention Standards (SIKI) over three days (April 7–9, 2025). Actions included monitoring respiratory status and oxygenation (frequency, depth, use of accessory muscles, breath sounds, oxygen saturation), providing the semi-Fowler position, and administering oxygen as needed.

### Evaluation

Evaluation was conducted using the SOAP format. On April 7, 2025, the patient reported reduced shortness of breath; RR was 26/min, breath sounds were wheezing, SpO<sub>2</sub> was 96%, and oxygen was delivered via nasal cannula at 5 L/min. The ineffective breathing pattern was unresolved, so interventions continued. On April 8, 2025, the patient reported no shortness of breath in the semi-Fowler position but mild tightness when oxygen was removed; RR was 24/min, wheezing persisted, SpO<sub>2</sub> was 98%, and oxygen was reduced to 3 L/min. The problem was partially resolved, and interventions continued. On April 9, 2025, the patient reported no shortness of breath, RR was 23/min, wheezing was absent, SpO<sub>2</sub> was 98%, and oxygen was discontinued. The ineffective breathing pattern was resolved, and interventions were stopped. These results are consistent with evidence that interventions such as semi-Fowler positioning and oxygen therapy are effective in resolving ineffective breathing patterns in patients with respiratory or cardiac conditions.

## DISCUSSION

Positioning is a key non-pharmacological nursing intervention to improve respiratory status. The semi-Fowler position allows greater diaphragmatic movement, enhances tidal volume, and reduces pulmonary venous congestion, thus increasing oxygen saturation (Yuliani, 2020; Suharto et al., 2020).

The results of this case support previous findings that semi-Fowler positioning can significantly improve oxygenation in CHF patients (El-Moaty et al., 2017; Wijayati et al., 2019; Hasna & Wachidah, 2023). However, as this is a single case, results should be interpreted with caution.

Several physiological mechanisms explain how the semi-Fowler position can improve oxygenation in patients with congestive heart failure (CHF). Elevating the upper body reduces abdominal pressure on the diaphragm, allowing for better lung expansion, which in turn enhances alveolar ventilation and decreases

ventilation-perfusion mismatch—two common problems in CHF due to pulmonary congestion. Additionally, the semi-Fowler position lowers cardiac preload and increases cardiac efficiency, leading to improved pulmonary perfusion and gas exchange. These combined effects have been shown to increase oxygen saturation by an average of 2–6% in CHF patients after the intervention, both in inpatient and intensive care settings (Febi Kusuma Nugraha et al., 2024; Muhammad Iqbal Rahmawan et al., 2024; Tantri Puspita et al., 2022).

The position also helps reduce shortness of breath and corrects ineffective breathing patterns, making it a highly recommended non-pharmacological intervention for CHF patients experiencing oxygenation problems (Rahmasari et al., 2024; Wijayati et al., 2019).

## CONCLUSION

The semi-Fowler position was effective in improving oxygen saturation and relieving dyspnea in a patient with Congestive Heart Failure. This simple nursing intervention should be considered as part of routine care for CHF patients experiencing respiratory distress.

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