

## Analysis of Nursing Care on Congestive Heart Failure Disease Using Semifowler's Position to Increase Oxygen Saturation

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### Abstract

**Background:** Cardiovascular disease is a health problem in both developed and developing countries. One of the most common cardiovascular diseases in Indonesia is congestive heart failure. Congestive heart failure is a condition in which the heart is unable to maintain adequate cardiac output to meet metabolic and tissue oxygen demands despite good venous flow.

**Objective:** This case study aims to obtain an overview of applying semi-fowler position to increase oxygen saturation in patients with congestive heart failure.

**Methods:** The study used was a descriptive case study by conducting nursing care and literature review. Participants in this study were patients with congestive heart failure with impaired breathing patterns.

**Result:** This case showed that applying semi-fowler position to Cardiac Heart Failure Patient was increased the oxygen saturation, which is characterized by a significant increase in oxygen saturation value with an average value of 3% each day.

**Conclusion:** nurse can help patient increasing the oxygen saturation on CHF patient using semi fowlers position.

**Keywords:** *Nursing Care, Heart Failure, semi-fowlers*



## **INTRODUCTION**

Cardiovascular disease is one of the health problems in both developed and developing countries. Cardiovascular disease is still a high threat in the world. One of the most common cardiovascular diseases in Indonesia is congestive heart failure (Litbang Kemenkes, 2018).

Congestive heart failure is a condition in which the heart is unable to maintain adequate cardiac output to meet metabolic and tissue oxygen demands despite good venous flow (Smeltzer, 2015). Regarding World Health Organization, cardiovascular disease is the number one disease worldwide. More than 17 million people worldwide die from heart and blood vessel disease (Ministry of Health, 2019). According to American Heart Association, 5.3 million people suffer from heart failure in the United States, 660,000 new cases are diagnosed each year with an incidence ratio of 10/1000 of the population over the age of 65 years (PERKI, 2015).

The main symptoms of heart failure are chest pain and shortness of breath. Chest pain occurs suddenly. The cause of chest pain is a decrease in oxygen supply to the heart muscle, which leads to the death of heart cells. Shortness of breath and decreased volume are caused by structural and functional abnormalities of the heart, resulting in impaired ventricular function and the inability to meet the body's tissue needs for nutrients and oxygen (Trayhurn, 2019). Dyspnea, which occurs due to increased blood volume and increased venous return due to decreased cardiac output, results in increased cardiac work and increased oxygen demand by the heart muscle. Heart failure patients with dyspnea experience oxygen desaturation, which can lead to hypoxia. Approximately 75-89% of heart failure patients experience a decrease in oxygen saturation (Wijayati et. al., 2019).

Oxygen saturation is the ability of hemoglobin to bind oxygen, which is indicated by the degree of saturation or saturation (SPO<sub>2</sub>). Continuous measurement of capillary oxygen saturation can be performed using cutaneous oximetry. Patients with perfusion/ventilation disorders, such as pneumonia, emphysema, chronic bronchitis, asthma, pulmonary embolism, congestive heart failure, are ideal candidates for pulse oximetry. Management of care that can be done to overcome oxygen saturation in heart failure patients includes checking vital signs, educating the patient about what is happening to avoid anxiety, resting the patient to reduce oxygen consumption, and adjusting the position (Hass, 2015).

Oxygen saturation is the percentage of hemoglobin bound to oxygen in the arteries (Wijaya, 2015). The normal value of oxygen saturation measured using pulse oximetry ranges from 95-100% (Septia, 2016). A saturation value of less than 85% indicates that the tissue does not get enough oxygen so that the patient requires further evaluation and a low oxygen saturation value (<70%) is a dangerous condition for the patient (Andriani & Hartono, 2017). Masip et. al., (2012) explained that oxygen saturation less than 93% may indicate heart failure. Further, Vold et. al., (2015) explained that the oxygen saturation less than or equal to 95% was predict an abnormality on patients with chronic obstructive pulmonary disease (COPD) when sleeping, exercising and on the airplane travelling.

Position is an action that is done intentionally to provide body position in improving physical and psychological well-being or comfort. Nursing interventions performed for heart failure patients include placing a therapeutic bed, therapeutic position, positioning the patient in an alienated body condition, positioning it to reduce dyspnea such as semi-fowler's position, elevating 45 degrees or more above the heart to improve backflow. The sleeping position increases cardiac output, which reduces chest tightness and pain. An elevated head position increases tidal volume because the pressure on the diaphragm is reduced, the lungs

are flowing better, and the amount of venous return to the heart is reduced, which reduces the work of the heart and increases oxygen saturation (Isrofah et. al., 2020).

The semi fowler position is the act of positioning the patient in a semi-sitting position by supporting the head and shoulders using a pillow, the knee is bent and supported by a pillow, and the foot pads must maintain the foot in position (Ruth, 2015). The semi-fowler position is a sleeping position with the head elevated 30°–45°. It can reduce oxygen consumption and can increase lung expansion to be more maximal (Isrofah et. al., 2020). So that, Nurses should give this position to patients with cardiorespiratory disorders as independent of nursing care implementation in the management of hypoxia (Najafi et. al., 2018; PPNI, 2018; Doyle and McCutcheon, 2012)

## **METHODS**

### **Study Design**

The method used is a descriptive case study by conducting nursing care and literature review. The patient in this study was a Congestive Heart Failure Patient with impaired breathing patterns.

### **Participants**

The participant was chosen random patient as criteria an inpatient who had impaired breathing pattern, can talk and conscious. Signs and symptoms felt by the patient at the time of the assessment were complained of shortness of breath, blood pressure 98/62 mmHg, pulse 98 x/m, respiration 25x/m, and CRT >3 seconds. Besides that, the SPO2 was 92% assisted by nasal oxygen cannula 5 lpm. Furthermore, the patient showed the using of the breathing accessory muscles, nostril breathing and orthopnea

### **Instruments**

The author was an instrument itself assisted with fingertip Pulse Oximetry that available in ward. The data were recorded on Nursing Care Form.

### **Intervention**

Semi fowler position as intervention was implemented in accordance with the steps in the planning guidelines of the Indonesian National Nurses Association (PPNI) with the books used namely SDKI, SLKI, and SIKI to determine nursing diagnoses, goals and objectives of nursing, nursing plans and to evaluate the actions given to the patient (PPNI, 2017; PPNI 2018; PPNI 2021). The interventions that had been carried out were monitoring respiration by monitoring breathing patterns, oxygen saturation, frequency, depth, respiratory effort, and oxygen therapy. The authors provide interventions by positioning the patient in a semi-Fowler 's way as airway management to overcome the problems experienced by the patient and increase oxygen saturation in the patient. The intervention was carried out in accordance with the Indonesian Nursing Intervention Standard (SIKI) which was already evidence-

based/Evidence Based Practice (EBP). The intervention was applied under the supervision of the nurse in charge of the patient.

### Data Collection

The intervention was conducted on April 15, 2022 at 09.00 in the Olive Room 3 of Al-Ihsan Hospital, West Java Province. A 54-year-old patient being treated in Olive Room III RSUD Al-Ihsan Bandung who has been suffered from *Congestive Heart Failure*. *Congestive Heart Failure* suffered by patient disappear from his history of hypertension which he suffered for seven years.

### Data Analysis

The authors used descriptive analysis on Microsoft Excel.

### Ethical consideration

Participant agreed that his health data published without any identification (anonymous).

## RESULTS

The semi-fowler position carried out in accordance with *evidence-based practice* to patient got positive results. In this case, there was an increase in oxygen saturation after being given a semi- *fowler position*, from the results of 92% oxygen saturation to 99% with the intervention given during 3 days with an average increase in oxygen saturation of 2-3% per day.

**Table 1. Oxygen saturation being given a semi- *fowler 's position***

Date	Oxygen Saturation	
	Before intervention	After intervention
<b>April 15, 2022</b>	92%	94%
<b>April 16, 2022</b>	94%	96%
<b>April 17, 2022</b>	96%	99%

## DISCUSSION

The nursing process that has been implemented in providing nursing care to the patient in this case had been implemented for 3 days. During the author's field there were no difficulties in performing nursing care for patients. After the authors carry out the stages of the nursing process and interventions based on evidence-based practice (EBP) related to

cases Congestive Heart Failure get positive results on nursing problems experienced by patients.

This case was in accordance with previous studies that the semi-fowler position was increase oxygen saturation in patients. Based on the results of research conducted by Kanine and Bakari (2022) after conducting *evidence-based nursing* based on journals/articles that have been analyzed, the results show that there is an effectiveness of changing the Semi fowler position with an increase in saturation of 2%. This study is also in line with research conducted by Ani (2020), the application of the semi - fowler position (sitting position 45°) for 3 days was reduce shortness of breath in patients and increased in oxygen saturation by 2%. Another research by Wijayati et. al., (2019) at RSUD Dr. Loekmono Hadi Kudus, there was 2% increasing of oxygen saturation after giving the semi -fowler sleeping position of 45° the O<sub>2</sub> saturation. It was 96% before and was change to 98% after. Furthure, a study conducted by Pambudi & Dimas (2020) with the title fowler's Position to Increase Oxygen Saturation in Congestive Heart Failure (CHF) Patients Who Experience Shortness of Breath. There were change in O<sub>2</sub> saturation of the two respondents by 4-5%. Last, research conducted by Najafi et. al., (2018) in the ICU and CCU of 22 Bahman Hospital in Gonabad Iran, showed that arterial blood oxygen in the earlobe and in the semi-fowler position was higher than other points and positions.

Regarding the nursing problem of ineffective breathing patterns that arose, the main implementation given to patient was by providing a semi-fowler position. It was developed of lung expansion more maximal so that the expected result that the patient breathing pattern improved oxygen saturation increased. Intervention in the semi - fowler position needs to be given because the provision of the semi - fowler position is a simple and effective measure to reduce the risk of decreased chest wall expansion. The semi - fowler position is usually given to patients with shortness of breath who are at risk for decreased oxygen saturation, such as cardiopulmonary conditions with an 11-degree slope of 30–45° (Wijayati, et. al., 2019; Muzaki and Ani, 2020; Wahyuni, 2015).

## CONCLUSION

A semi-fowler position overcome the main nursing problems of ineffective breathing pattern by increasing patient chest expansion thereby oxygen saturation.

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