

CHAPTER I

INTRODUCTION

1.1 Background

Changes in oxygen saturation and respiratory rate are common problems found in patients with respiratory disorders treated in the ICU. Oxygen saturation is a parameter of the percentage of hemoglobin bound to oxygen at the time of measurement. Respiratory rate is also a component of vital signs, which can be used to determine the condition of the patient, especially the condition of critical patients (Bruijns et al. 2014). In a study by Erna (2018) showed that patients who experience respiratory disorders in the ICU are very susceptible to experiencing a significant decrease in oxygen saturation (SpO₂) between 4-10%. Patients whose oxygen saturation was 94% experienced a decrease to 88%, a decrease of up to > 5%. Another study by Maggiore (2013) found that 46.8% of respondents had experienced a decrease in oxygen saturation. Patients whose oxygen saturation measurement results were 98- 99% experienced a decrease of up to 90-91%. This decrease was followed by an increase in respiratory rate.

Decreased oxygen saturation values and increased respiratory rate in critical patients in the ICU have a significant impact on the health and prognosis of patients. The physiological impact that patients will experience if they are unable to maintain adequate oxygen saturation will

experience hypoxia (Schutz, 2011). Increased respiratory rate (tachypnea) if too high can cause respiratory fatigue and increase the risk of respiratory failure. Patients with severe hypoxemia, hypoxia and tachypnea have a higher risk of death if not treated immediately and properly. This certainly has an impact on the increase in the number of critical patients in hospitals. Based on data from the Indonesian Ministry of Health (2019), the prevalence of critical patients in Indonesia in 2019 was recorded at 33,148 patients with a percentage of patient deaths in the ICU reaching 36.5%.

Changes in oxygen saturation and respiratory rate can be caused by suction. This can happen because during the suction process, oxygen in the lungs is released along with secretions. Changes in oxygen saturation stimulate the body to compensate by increasing the respiratory rate to meet the oxygen supply to the entire body so that complications do not occur after suction (Nofiyanto, 2013). Research by Maria et al (2019) showed that suction in patients with endotracheal tubes and no hyperoxygenation before suction decreased oxygen saturation from 98.44% to 92.72%. Hypothesis testing using a paired sample T-test produced a p value <0.05 , indicating a significant difference before and after suction.

The results of another study by Nizar and Haryati (2015) showed an increase in oxygen saturation from 89.86% to 91.65% after suction in patients with decreased consciousness and an increase in respiratory rate due to cough stimulation when the catheter touched the carina. Research by Nofiyanto (2013) stated that open suction action using a larger suction cannula size can significantly change cardiopulmonary parameters with an increase in respiratory rate (RR) of 4.971. The results of RR measurements from 17 x/minute to 23 x/minute after suction action.

The results of a preliminary study conducted at the Central Surgical Installation of Sanjiwani Hospital, Gianyar in 2022 regarding the description of oxygen saturation in intraoperative patients with general anesthesia after suction, as many as 95 respondents had normal oxygen saturation values (95-100%) and 5 other respondents experienced mild hypoxia with oxygen saturation values (90-95%). This indicates a change in oxygen saturation after suction. Research by Sari, R. F (2019) discussed the effect of open suction on tidal volume in 12 patients at Dr. Soedarso Hospital showed that there was an effect of changes in tidal volume in patients who underwent suction before and after the procedure, namely a decrease in the patient's tidal volume. Before the procedure, the tidal volume was 382 while after the procedure it was 286. The time it took to return to normal tidal volume was around 16 seconds. The results of another study by Melastuti (2018) stated that the patient's hemodynamic condition after suctioning changed, one of which was an increase in the respiratory rate

(RR), but the significant measurement results were not explained. The hypothesis in Melastuti's (2018) study stated that the hemodynamic conditions of patients who underwent suction without prior hyperoxygenation experienced relative changes.

Based on the results of journal research on Google Scholar using the keywords suction action, changes in oxygen saturation and respiratory rate, a study was found by Sucianti (2022) on the description of oxygen saturation after suction in intraoperative patients with general anesthesia and a study by Calisanie & Fauzi (2023) on the application of the closed suction method in patients with endotracheal tubes and ventilators on oxygen saturation, blood pressure, heart rate. Previous studies analyzed oxygen saturation values after suction and respiratory rate was not specifically explained. Until now, researchers have not found a study that discusses and connects the duration of suction with oxygen saturation and respiratory rate in the Intensive Care Unit (ICU). Therefore, researchers are interested in examining the Relationship between Suction Duration and Oxygen Saturation and Respiratory Rate in Intensive Care Unit (ICU) Patients.

1.2 Formulation of the problem

Is there a relationship between suction duration and changes in oxygen saturation and respiratory rate in Intensive Care Unit (ICU) patients?

1.3 Research purposes

1.3.1 General purpose

Analyzing the relationship between suction duration and changes in oxygen saturation and respiratory rate in Intensive Care Unit (ICU) patients

1.3.2 Special purpose

1. Identifying the duration of suction in Intensive Care Unit (ICU) patients
2. Identifying oxygen saturation in Intensive Care Unit (ICU) patients
3. Identifying the respiratory frequency of Intensive Care Unit (ICU) patients
4. Analysing the relationship between suction duration with oxygen saturation and respiratory frequency of Intensive Care Unit (ICU) patients

1.4 Benefits of research

1.4.1 Theoretical Benefits

1. For Researchers

This research is useful as a means of insight and knowledge in providing better nursing care to Intensive Care Unit (ICU) patients.

2. For Educational Institutions

This research is useful as reference material for critical care nursing courses and can be applied in suction nursing practice in Intensive Care Unit (ICU) patients.

1.4.2 Practical Benefits

1. For Hospitals

As input, considerations and evaluations are needed in implementing nursing actions in the form of suction on patient to pay more attention to the oxygen saturation value and respiratory frequency of the patient.

2. For Nurses

It can be used to develop knowledge and skills in carrying out suction procedures on patients by always monitoring to see changes in the patients oxygen saturation value and respiratory rate.