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CASE STUDY

THE APPLICATION OF "MORNING ROUTINE" FOR PATIENTS WITH CRITICAL ILLNESS IN INTENSIVE CARE UNIT: A CASE STUDY

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ABSTRACT

Respiratory failure is still the main cause of morbidity and mortality in the Intensive Care Unit (ICU). Critical illness and treatment in the ICU are a less pleasant experience for patients and affect the patients' psychologies. This paper is a case study to analyze the effectiveness of environment modification in the ICU called the "Morning Routine" at one of the public hospitals in Jakarta. The result of morning routine implementation in the ICU showed a positive impact on patient recovery. Patients' ability to be adapted to the intensive care environment is one of the keys to the success of nursing care for critical cases.

Keywords: ARDS; critical illnesses; intensive care unit; morning routine

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INTRODUCTION

The inpatient experience in the Intensive Care Unit (ICU) can be unexpected and stressful for patients and their families. Some literatures have demonstrated that the patient experiences sequelae during treatment in the ICU, e.g., post-traumatic stress disorder (PTSD), depression, fatigue, and post-intensive care syndrome (Weber, Byrd, Cape, McCarthy, & Exline, 2017). Pain, anxiety, and delirium contribute to increased stress and agitation. Therefore, the prevention and management of pain, anxiety, and delirium are important components of ICU nursing care. To overcome pain, agitation, and delirium problems during the patient's stay in the ICU, the Society of Critical Care Medicine (SCCM) developed the Bundle of ABCDEF in 2013, which includes Awakening, Breathing, Coordination, Delirium, Early Mobility, and Family Engagement and Empowerment (Barr, et al., 2013).

Patients' psychological conditions during treatment in the ICU also affect patients' physical condition, which further affects the length of patients' recovery time. The length of patient stay in the ICU increases the risk of nosocomial infections (e.g., ventilator-associated pneumonia (VAP)), worsens complications from typical diseases, and increases the cost of admission. One of the goals of nursing care is meeting patients' primary needs such as assisting patients' adaptation to their diseases.

The role of nurses in patient adaptation involves the modification of the intensive care experience from discomfort and stress to trust, safety, comfort, and dignified experiences for patients. Environmental modification is a unique method to help patients adapt when undergoing intensive care.

The unique nursing intervention in this study was the modification of the inpatient environment and the atmosphere in the ICU through a method called "Morning Routine". The modification was conducted and scheduled routinely every morning at the established time in the unit. The actions included turning on the lights, opening the

window blinds, adjusting the position of the head through elevation by 30 degrees, and discontinuing sedatives.

Departing from the routine activities of nurses in the ICU, which interfere with medical actions in the routine ICU protocol, the authors offer a protocol in intensive nursing care called "Morning Routine". The aim of the application of "Morning Routine" was to create a patient-friendly ICU care environment, foster comfort, and normalize and restore patients' circadian rhythm. "Morning Routine" helps nurses provide a safe, comfortable, and dignified critical care environment for patients and reduces pain, anxiety, and the risk of delirium in patients during ICU care.

METHOD

This is a case study of a patient with acute respiratory distress syndrome (ARDS) undergoing mechanical ventilation in the ICU with the application of "Morning Routine". The data collection techniques included interviews, observations, physical examinations, medical records, and hospital records. The data were analyzed to determine nursing problems experienced by patients and to review the effectiveness of the interventions that have been applied to resolve patients' nursing problems.

RESULT

Case Overview

The patient was male, 50 years old, Javanese, and Muslim. The patient was admitted from the emergency room with a referral for suspected gastric perforation. The history of the present illness was obtained from the patient's wife, and the patients' medical history was obtained from the medical record.

The patient complained of abdominal nausea and pain for five days before presenting to the hospital. He presented to a nearby clinic for treatment and was considered to have no indication of emergency response, therefore he was advised to undergo outpatient treatment. After returning from the clinic, the patient had black diarrhea.

The patient was taken to the hospital emergency room nearby and underwent a chest X-ray and resulted in suspected abnormalities. The patient was advised to undergo a computed tomography scan of the abdomen, and a gastric perforation was found. The abdominal pain worsened to the state where the patient experienced shortness of breath and he also had a fever. The patient was referred to a larger hospital that has more complete facilities for further treatment.

The patient presented to the emergency room with hypotension, tachycardia, and tachypnoea. The assessment resulted in a blood pressure of 100/70 mmHg, pulse rate of 158 beats per minute, respiratory rate of 36 breaths per minute, 86% oxygen saturation, and hemoglobin concentration of 6.4 g/dL. The abdominal examination results showed epigastric pain during palpation, liver defects that disappeared on percussion, and absent bowel sounds during auscultation. The abdomen seemed distended and tense.

The patient underwent an exploratory laparotomy with 300cc of bleeding. Postoperatively, the patient was admitted to the ICU. The initial postoperative awareness of the patient was still under the influence of drugs with 2/2 isochoric pupils and +/+ light reactions. The patient underwent mechanical ventilation with pressure control RR 12/PEEP 5/FiO_2 40%.

Postoperative laboratory examination results included hemoglobin 6.4 g/dL, hematocrit 22.5%, leukocytes 16,410/µ, thrombocytes 355,000/µ, urea 93 mg/dL, creatinine 1.10 mg/dL, estimated glomerular filtration rate 77.9 mL/min, albumin 1.78 g/dL, Aspartate Aminotransferase (AST) 59 U/L, Alanine Aminotransferase (ALT) 32 U/L, sodium 142 mEq/L, potassium 5.23 mEq/L, chloride 105.8 mEq/L, blood calcium 6.7 mg/dL, calcium ion 1.07 mmol/L, magnesium 2.34 mg/dL, prothrombin time (PT) 10.9 seconds with control 10.9 seconds, APTT 50.9 with controls 32.0 seconds, and procalcitonin 73.36 ng/mL. The results of the radiological examination in the form of photo thorax showed right perihilar and pericardial infiltrates with a differential diagnosis of pneumonia. Blood and sputum cultures were collected from the patient upon admission to the ICU.

The first day assessment at 6.00 a.m. was based on Blood Gas Analysis (BGA) results with Synchronized Intermittent Mandatory Ventilation (SIMV) PC 12/RR 12/PEEP 5/FiO_2 40%; the PaO_2 was 69.5 mmHg, and there was large, thick, and dirty sputum production. The ventilator mode was changed to SIMV PC 12/PEEP 7/FiO_2 55%. At 3 p.m., the SaO_2 monitor dropped to 94%, and the ventilator mode was changed to SIMV PC 12/RR 12/PEEP 10/FiO_2 55%.

On the second day of treatment, with SIMV PC 12/RR 12/PEEP 10/FiO2 55%, PaO_2 was 80.8 mmHg and saturation in the monitor was between 94% and 96%. On the third day of treatment, PaO_2 was 71.4 mmHg with 55% FiO_2, therefore ARDS diagnoses were established based on the results of the comparison between PaO_2 and FiO_2 < 140.

The patient has a history of cerebral vascular disease (CVD). Based on medical records, no data was found showing the type of stroke suffered by the patient (i.e., hemorrhagic or ischemic), or how long the patient had suffered a stroke. The patient was a heavy smoker with a history of taking herbal supplements for the past three years. The patient was diagnosed with CVD in January 2015.

The patient had hypertension, controlled with 10 milligrams of amlodipine daily. The patient's family denies a patient history of gastritis and diabetes mellitus. The patient has had no previous surgery.

Nursing Management

Nursing management is a unified nursing process. The initial nursing management stage is the assessment, which can be primary or secondary. Primary assessment involves examining airways, breathing, circulation, disability, and exposure. Secondary assessment involves head-to-toe physical examination and collecting additional data that support assessment.

Problems that arise based on the assessment include disturbances in gas exchange, ineffective airway clearance, ventilator weaning disorders, hyperthermia, impaired skin integrity, nutritional deficits, diarrhea, risk of infection, and anxiety.

The results of applying the "Morning Routine" approach are as follows. On the first day after the surgery, the patient had begun to wean from sedation. The patient was compos mentis and cooperative, seeming very enthusiastic when he was informed that the operation was over. The patient remained under close observation in the ICU, assisted by a

ventilator and receiving medication through an intravenous (IV).

The patient cooperatively participated in deep breathing exercises, led by nurses, to reduce operating wound pain. The patient's enthusiasm was demonstrated by nodding, indicating that he understood the instructions. The nurses explained to the patient that the breathing assistance from the ventilator would be incrementally reduced according to their ability.

Up to the third day of treatment, the patient remained unable to be weaned from the ventilator. Their respiratory condition was unstable. The complications of conditions such as diarrhea and damage to skin integrity began to affect the patient's psychological state. The patient began exhibiting moodiness and became less enthusiastic about the treatment.

The patient expressed his concern about the failure of the treatment and his fear of death. He complained about his difficulty with rest because of fatigue, shortness of breath, and panic at hearing many alarm sounds from the ICU's equipment. The patient was afraid to sleep because he worried that he would not be able to wake up again.

Nursing management focused on managing the patient's complaints in a non-pharmacological way, through distraction techniques, deep breathing, guided imagery, and the application of "Morning Routine". In addition, all nursing actions considered the patient's safety and comfort, involved him in decision-making, and promoted active listening.

Assessment on the third day of treatment did not reveal any significant improvement in the patient's condition. He had developed an infection, which worsened his respiratory condition. This in turn contributed to his inability to wean from the ventilator. In addition, CVD and hypertension became complicating factors in the patient's recovery.

The application of "Morning Routine" positively affected the patient's recovery. He was able to wean from sedatives quickly after surgery, require minimal use of sedatives, and optimize his neurological status. He also became more cooperative with the treatment. Mental well-being improved the patient's blood pressure, rid his bloodstream of fibrils, and restored optimal hydration.

DISCUSSION

The main goal of the ABCDEF bundle is to recognize the importance of the back-end in critical care. This means that the initial management of patient care in the ICU must follow aggressive diagnostic and therapeutic processes that focus on saving lives. During this period, patients are subject to many diagnostic actions and lifesaving therapies such as sedation, bed rest, and mechanical ventilation. The benefits of these interventions depend entirely on the needs of the patients. When patients do not need anymore, interventions that were initially considered lifesaving may cause iatrogenic injuries (e.g., acute and chronic cognitive and functional disorders).

The ABCDEF bundle is designed to reduce the potential of iatrogenic injury by (1) standardizing the nursing and coordination processes with the aim of restoring the patient's normal cycle from over-sedation, use of mechanical ventilation, and immobilization, (2) empowering nurses and health care teams to manage patient care holistically, and (3) ensuring that the treatment is a standard choice unless it risks the patient's safety and ability to problem solve (Balas, 2012).

Immobilization is the main cause of pulmonary complications in patients with critical illnesses. Real immobilization greatly affects the pulmonary perfusion process. For example, when the patient stands, blood will flow to the base of the lungs; when the patient is supine, the posterior of the lungs will get better circulation than the anterior.

Patients with nosocomial infections such as VAP spend more time in the ICU than patients without nosocomial infections. The incidence of VAP in patients on mechanical ventilation is around 22.8% and accounts for about 86% of all cases of nosocomial infections (Rahman, Huriani, & Julita, 2011). The requirement to change bedding has been shown to enhance the prevention of skin damage and mobilize pulmonary secretions (Wanless & Aldridge, 2012).

In addition, several studies have reported abnormal sleep patterns and circadian rhythms in patients with critical illnesses (Boyko, Jennum, & Toft, 2017). The disruption of the patient's sleep can cause delirium and prolong their ICU stay while increasing mortality. Sleep disorders are closely related to immune and cardiovascular dysfunction, metabolic disorders, memory disorders, cognitive impairments, and increased mortality.

The standard method of sleep assessment and polysomnography will be complicated to implement in critically ill patients due to the difficulty of interpretation caused by confounding variables such as sedation, the ICU environment, medications, and mechanical ventilation. The release of the sleep hormone melatonin, which regulates circadian rhythms, is often hampered in critically ill patients.

The majority of critically ill patients need some form of analgesic or sedative therapy while in the ICU. This may involve various combinations of opioids, benzodiazepines, hypnotics, and antipsychotics. Nurses are responsible for managing medications for patients on mechanical ventilation, helping patients recover from invasive procedures, protecting staff from aggressive or agitated patient behavior, and reducing patient pain and anxiety. Like invasive procedures, sedatives and analgesics also have side effects, including respiratory depression, hypotension, and kidney failure.

Some studies have highlighted the relationship between ICU-acquired delirium and the use of sedatives such as benzodiazepines (Balas, Vasilesvkis, Burke, Boehm, Pun, Olsen, et al., 2012). Interest in this problem has been on the rise, and strategies are being developed to reduce patient exposure to sedatives.

Treating ARDS requires that nurses focus on perfusion monitoring, giving position, protection to pulmonary ventilation, weaning protocol, and prevention of further complications (Powers, 2007). In this case, nurses combined the Morning Routine approach with giving position and weaning protocol.

1. Giving position

The patient's position also affects perfusion. The following are ways to position ARDS patients to reduce complications and improve perfusion.

a. A forty-degree (oblique) tilt

This position increases oxygenation by mobilizing secretion, helps repair atelectasis, increases residual lung functional capacity, increases the V/Q ratio, and reduces interstitial fluid accumulation. This change in filtration can also reduce the risk of pneumonia, the risk of damaging skin integrity, ICU treatment duration, and the use of mechanical ventilation.

b. Prone position

This position increases the V/Q ratio. The heart will not be squeezed by the inflation of the left lung, as in the supine position. When the patient is in the prone position, most posterior lung tissue will move anteriorly, thus repairing atelectasis, clearing the lungs from debris attached to the pulmonary parenchyma, reducing lung inflammation, and increasing oxygenation.

Although these positions have disadvantages - including the possibility of ventilator circuits being released, ETT migration, patient desaturation, prolonged skin damage, and facial oedema - by ensuring adequate patient hygiene and monitoring the patient's clinical condition, nurses can prevent most of these complications. Patients with refractory hypoxemia are typically placed in a prone position when the ventilator settings have been maximized (i.e., with 100% FiO2 and high PEEP administration).

In this case, no oblique or prone position was used. This was due to the hemodynamic conditions of patients who are not very stable (e.g., tachycardia and hyperthermia). The patient's continuously seeping laparotomy wound was an additional factor to using the prone position.

In accordance with the "Morning Routine" approach, every morning at 8 a.m., the patient's head was elevated 30 to 45 degrees. Several studies present conflicting opinions related to the impact of position elevation on gas exchange. Arterial oxygen pressure tends to decrease when in a sitting position after a surgical procedure, although this effect gradually declines over time. Several other studies reported no statistically significant differences in oxygen saturation when using elevation positions of 0, 20, 30, 40, and 45 degrees for patients after cardiac surgery (El-Moaty, El-Mokadem, & Abd-Elhy, 2017).

A study by Anchala (2016) revealed a significant difference between systolic blood pressure when using a left-lateral position and oxygen saturation when using the semi-Fowler's position, compared with the other positions. The semi-Fowler's position better increases oxygen saturation, which in turn prevents hypoxemia, desaturation, and respiratory insufficiency. Administering a therapeutic position, adjusted in accordance with bed rest schedules, can stabilize various hemodynamic parameters and prevent further complications.

2. Weaning protocol

Mechanical ventilation weaning protocols can reduce treatment duration and maintenance costs for ARDS patients. The following are suggested guidelines for weaning ARDS patients from mechanical ventilation.

- Implement protocols for all health care professionals, not only medical teams
- Use the spontaneous breathing mode, not the SIMV mode
- Adjust protocols to meet the requirements of patient care
- Focus protocols on improving, not replacing, clinical assessment
- Focus the administration of sedatives on reducing the use of mechanical ventilation and shortening the ICU stay

In this case, the SIMV ventilator mode was still being used, with the justification that the patient already breathed by his own effort but had difficulty transitioning to the spontaneous breathing mode. The use of sedation was limited to a minimum dose (i.e., midazolam, 1 mg/hr) with the aim of preventing an increase in the patient's effort to breathe. Respiration, hemodynamics, and blood gas analysis were strictly monitored.

Deep sedation is often associated with prolonged intubation and increased mortality. On the contrary, several studies have shown that comfort during the use of mechanical ventilation can be increased with mild sedation, reducing delirium and length of ICU stay (Nunes, et al., 2018).

The implementation of "Morning Routine" in this case required ceasing morning sedation. Nursing assessments focused on the efforts of the patient to wean from mechanical ventilation without sedation. Nurses needed to ensure that the patient was strong enough to undergo the weaning process. Hemodynamic conditions—including blood pressure, heart rate, breathing frequency, and oxygen saturation—as well as pain complaints, were the main focus of assessment in this weaning process.

Furthermore, in accordance with the "Morning Routine" approach, the arrangement of light, both natural and artificial, at 8 a.m. every morning was expected to restore the patient's circadian rhythm. Light is the most important regulator of the circadian rhythm, which is set by the timing center in the suprachiasmatic nucleus (SCN) of the mammalian brain. Light entering through the retina stimulates the SCN through non-visual pathways. Through this process, the light signals send a code to the center of the circadian clock that communicates time information throughout the body (Durrington, 2017).

Sleep disorders are common in patients being treated in the ICU, where patients are exposed to low levels of artificial light during the day and constant light disturbances at night. Many studies have demonstrated the adverse health effects of light disturbances. Research ranging from human epidemiological studies to laboratory studies using animal models show that constant light disturbances increase morbidity and mortality. One-half of rats recovering from sepsis died when exposed to constant light or dark conditions, while only between 5 and 10% of rats died when exposed to alternating light conditions throughout the day and night. This finding demonstrates the importance of maintaining a pattern of light and dark light when treating septic patients (Durrington, 2017).

The application of "Morning Routine" in this case was done regularly and consistently every 8 a.m. by switching on every light in the ICU.

If a patient is treated in a room with windows that look out outside the environment, such as a courtyard, the curtains are drawn to permit sunlight to freely enter the room. Curtains between the beds are drawn so that patients can interact with each other. A digital clock or wall clock is used as much as possible, placed in the patient's line of sight to make it easy for them to know the time. For patients who are Muslim, the use of a timepiece can be accompanied by a reminder of the time for prayer. Nurses can guide patients

to pray in bed according to the patients' ability. Thus, patients' biological, psychological, social, cultural, and spiritual needs can be met throughout their treatment.

A limitation of this study is the infection that the patient developed while hospitalized. This opportunistic infection was caused by the long-term use of mechanical ventilation. Systemic infections that cannot be treated with medications can lead to sepsis, one of the most common causes of death in ICU patients.

CONCLUSION AND RECOMMENDATION

Critical illness and treatment in the ICU are unpleasant for patients and affect their mental well-being, which in turn affects their physical well-being. Significant effects involved the length of stay and the risk of complications and nosocomial infections.

There are many ways to apply the evidence in clinical nursing, such as through the development of evidence-based protocols. Some ICUs have implemented protocols such as the VAP bundle or the ABCDEF bundle but have not ruled out the possibility of developing several new evidence-based protocols. The application of "Morning Routine" in this case had a significant positive impact on patient recovery while meeting nursing management recommendations for ARDS, which include monitoring perfusion, positioning, protection to pulmonary ventilation, weaning protocols, and preventing further complications.

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