
ANALYSIS OF NURSING PRACTICES IN COPD PATIENTS USING THE INTERVENTION OF PROVIDING THE HIGH FOWLER POSITION TO IMPROVE LUNG VENTILATORY FUNCTION IN THE ED ROOM OF HJ BUNDA HALIMAH HOSPITAL BATAM

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease characterized by irreversible airflow obstruction associated with an inflammatory lung response to toxic particles or gases (Jain, Lolak 2009 in Anissa, 2022). One of the treatments for COPD is to adjust the position and breathing pattern to reduce the amount of trapped air (Padila, 2012). The aim of this research is to analyze cases managed using the high fowler position in COPD patients in the emergency room at Hj Bunda Halimah Hospital Batam in 2022. Setting the high fowler position can help the lungs expand optimally thereby helping to increase gas exchange (Black & Hawks, 2005). This KIA-N aims to provide an overview of nursing care for patients with symptoms of dyspnea in COPD patients. The results obtained from the patient analysis were a decrease in complaints of shortness of breath felt in COPD patients with an increase in lung ventilation and was characterized by a decrease in respiratory frequency and an increase in oxygen saturation.

Keywords: COPD, High Fowler

ANALISIS PRAKTIK KEPERAWATAN PADA PASIEN PPOK DENGAN INTERVENSI PEMBERIAN POSISI *HIGH FOWLER* UNTUK PENINGKATAN FUNGSI VENTILITAS PARU DI RUANG IGD RS HJ BUNDA HALIMAH BATAM

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Abstrak

Penyakit Paru Obstruksi Kronik (PPOK) merupakan penyakit paru progresif yang ditandai dengan adanya hambatan aliran udara ireversibel yang berkaitan dengan respons inflamasi paru terhadap partikel atau gas beracun (Jain, Lolak 2009 dalam Anissa, 2022). Salah satu penatalaksanaan pada PPOK adalah dengan mengatur posisi dan pola pernafasan untuk mengurangi jumlah udara yang terperangkap (Padila, 2012). Adapun tujuan penelitian ini untuk menganalisa kasus kelolaan dengan penggunaan posisi *high fowler* pada pasien PPOK di ruang IGD RS Hj Bunda Halimah Batam Tahun 2022. Pengaturan posisi *high fowler* ini dapat membantu paru mengembang secara maksimal sehingga membantu meningkatkan pertukaran gas (Black & Hawks, 2005). KIA-N ini bertujuan untuk memberikan gambaran tentang asuhan keperawatan pada pasien dengan gejala *dyspnea* pada pasien PPOK. Hasil yang didapat pada analisa pasien adalah adanya penurunan keluhan sesak napas yang dirasakan pada pasien PPOK dengan adanya peningkatan ventilasi paru dan ditandai dengan penurunan frekuensi pernapasan dan peningkatan saturasi oksigen.

Kata Kunci: PPOK, *High Fowler*

Introduction

Health is an ideal condition for everyone. According to the World Health Organization (WHO), health is a state of complete physical, mental and social well-being which is not only limited to being free from disease and infirmity. Physical health is realized when a person does not feel sick or has no complaints and clinically there is no disease. Physical health is one aspect where physical health itself reflects that all body organs function normally or do not experience problems, including the health of the respiratory system (Notoatmodjo, 2010). Chronic Obstructive Pulmonary Disease (COPD) is a disease characterized by limited air flow in the airways that cannot be completely restored. COPD includes emphysema, chronic bronchitis or a combination of both. Emphysema is described as a pathological condition of abnormal enlargement of the air spaces in the distal bronchioles and damage to the walls of the alveoli, while chronic bronchitis is an airway disorder characterized by a chronic cough with phlegm for at least three months a year, at least two years in a row (Smeltzer & Bare, 2006). The World Health Organization (WHO) says that Chronic Obstructive Pulmonary Disease (COPD) is the third leading cause of death in the world. There were 3.23 million deaths in 2019. In Indonesia, based on 2013 basic health research data, the prevalence of COPD reached 3.7% or around 9.2 million people had COPD (Ministry of Health of the Republic of Indonesia, 2021).

When observing in the emergency room, most patients with shortness of breath are only given a half-

sitting position or have their head propped up with a pillow to reduce shortness of breath while waiting for the action to be given to the patient. Currently it is not known which positions are effective in influencing the ability to breathe and of course the client's comfort. Professional nurses must always work based on science in every implementation of nursing care, therefore a study is needed to test which position is best for COPD clients which will affect lung ventilation function. The aim of this study was to examine the effect of the high Fowler's position on lung ventilation function in COPD clients. Based on the data above, the author would like to explain the analysis of the implementation of nursing care using the high fowler position to improve lung ventilation function in clients with COPD in the Emergency Room (IGD) of the HJ Bunda Halimah Hospital, Batam.

Case Report

Clinical Features

On March 21 2022 at 15.20 WIB Mr. T came to the emergency room at HJ Bunda Halimah Hospital, brought by the family with complaints of shortness of breath since 1 day before entering the hospital and the shortness of breath became worse this afternoon, the client felt weak, nauseous but there was no vomiting or stomach pain in the pit of the stomach, the client also complained of coughing, phlegm and runny nose. The client said he was hospitalized on June 18 2021 with the same complaint. Past medical history, Mr. T said he had experienced a mild stroke and pulmonary TB since 1 (one) year ago, the client said he had been treated 5 (five) times at ST Elisabeth Hospital Batam City and most recently on June 18 2021 the client had been treated with the same

complaints as when This.

Vital signs examination results:
Blood Pressure: 125/79 mmHg,
Temperature: 36.8°C, Pulse
frequency 105 times/minute,
Respiratory frequency 35
times/minute, Oxygen saturation
60%. Compositis client
awareness level with GCS 15
(E4M6V5).

Laboratory results on March 21
2022 on a complete blood test with
Hemoglobin results 17.0 g/dL
(13.5-17.5g/dL), Hematocrit 54.7%
(40-50%),

Erythrocytes $6.3 \times 10^6/\text{ul}$ (4.45-
 $5.84 \times 10^6/\text{ul}$), Leukocytes $8.09 \times 10^3/\text{ul}$
($5-10 \times 10^3/\text{ul}$), Platelets
 $176 \times 10^3/\text{ul}$ ($150-400 \times 10^3/\text{ul}$),
MCV 86.7 fL (82-98 fL), MCH
26.9 pg (27-33 pg), MCHC 31.1%
(32-36%), Basophils 0, 50%
(<1.5%), Eosinophils 0.0% (1.5-
4.5%), Neutrophils 78.5% (49.5-
70.5%), Lymphocytes 7.0% (24, 5-
40.5%), Monocytes 14.0% (1.5-
8.5%), Erythrocyte sedimentation
rate 24 mm/hour (<10 mm/hour).
On a blood chemistry examination,
the results were blood sugar 220
mg/dL (<180 mg/dL), Urea 106.40
mg/dL (16.65-48.54 mg/dL),
Creatinine 1.6 mg/dL (0.75-1.24
mg/dL). On electrolyte examination
the results were sodium 136.9
mEq/L (136-145 mEq/L),
potassium 6.03mEq/L (3.5-5.1
mEq/L), chloride 96.4 mEq/L (93-
112 mEq/L) with a medical
diagnosis of Susp. COPD
exacerbation + CHF.

Laboratory results from the blood
gas analysis examination on March
21 2022 with pH results of 7.35
(7.35-7.45), pO₂ 38.7 mmHg (95-

100 mmHg), pCO₂ 68.3 mmHg (32-
45 mmHg), Bicarbonate (HCO₃) 38.4
mmol/L (22-26 mmHg), BE 8.5
mmol/L (-2.5-2.5 mmol/L), O₂
saturation 67.4% (95-100 %) with a
medical diagnosis of Susp. COPD
exacerbation + CHF.

Nursing diagnoses

Impaired gas exchange is related to
ventilation-perfusion imbalance.
Ineffective breathing patterns are
associated with decreased lung
expansion.

Ineffective airway clearance related to
airway obstruction.

Nursing Intervention

In preparing nursing interventions, the
author uses nursing plans based on
NANDA NIC NOC, in this case each
nursing plan is developed based on a
theory that is logically acceptable and
appropriate to the client's condition.
The planning stage in the case is based
on priority problems that have
previously carried out data analysis,
including:

Impaired gas exchange is related to
ventilation-perfusion imbalance. The
author's plan is: Airway Management:
open the airway, use the chin lift or
jaw thrust technique if necessary,
position the patient to maximize
ventilation, identify the patient's need
for installation. artificial airway
device, apply mayo if necessary, do
chest physiotherapy if necessary,
remove secretions

with coughing or suction, auscultate
breath sounds, note any additional
sounds, apply suction on mayo, give
bronchodilators if necessary, give a
humidifier, regulate fluid intake to
optimize balance, monitor respiration
and O₂ status and Respiratory
Monitoring: Monitor average, depth,
rhythm and respiratory effort, note
chest movements, observe symmetry,

use of accessory muscles, retraction of supraclavicular and intercostal muscles, monitor breath sounds such as snoring, monitor breathing patterns such as bradypnea, tachypnea, Kussmaul, hyperventilation, Cheyne-Stokes, biot, note the location of the trachea, monitor diaphragm muscle fatigue, auscultate breath sounds, note areas of decreased/absent ventilation and additional sounds, determine the need for suction by auscultating crackles and crackles in the main airway, auscultate lung sounds after the procedure to determine the results.

Ineffective breathing patterns are associated with decreased lung expansion

The author's plan is: Airway Management: open the airway, use the chin lift or jaw thrust technique if necessary, position the patient to maximize ventilation, identify the patient's need for an artificial airway device, apply mayo if necessary, perform chest physiotherapy if necessary, remove secretions by coughing or suction, auscultate breath sounds, note any additional sounds, suction on mayo, give bronchodilators if necessary, give a humidifier, regulate fluid intake to optimize balance, monitor respiration and O₂ status and plan oxygen therapy, namely clean the mouth, nose, and tracheal secretions, maintain a patent airway, arrange oxygenation equipment, monitor oxygen flow, maintain patient position, observe for signs of hypoventilation, monitor patient anxiety regarding oxygenation and plan Vital Sign Monitoring, namely monitoring BP, pulse, temperature and RR, note any fluctuations in blood pressure, monitor VS when the patient is lying, sitting or standing, auscultate

BP in both arms and compare, monitor BP, pulse, RR before, during and after activity, monitor the quality of the pulse, monitor respiratory frequency and rhythm, monitor lung sounds, monitor abnormal breathing patterns, monitor temperature, skin color and humidity, monitor peripheral cyanosis, monitor for the presence of Cushing's triad (widened pulse pressure, bradycardia, increased systolic), identify the cause of changes in vital signs. Ineffective airway clearance related to airway obstruction. The author's plan is: Airway Suction: confirm the need for oral/tracheal suctioning, auscultate breath sounds before and after suctioning, inform the client and family about suctioning, ask the client to breathe before suction is carried out, give O₂ using the nasal passages to facilitate nasotracheal suction, use sterile tools every time you carry out the procedure, advise the patient to rest and breathe deeply after the catheter is removed from the nasotracheal, monitor the patient's oxygen status, instruct the family on how to perform suction, stop suction and give oxygen if the patient shows bradycardia, increased O₂ saturation, etc. and plan Airway Management: open the airway, use the chin lift or jaw thrust technique if necessary, position the patient to maximize ventilation, identify the patient's need for installation artificial airway device, apply mayo if necessary, do chest physiotherapy if necessary, remove secretions by coughing or suction, auscultate breath sounds, note any additional sounds, perform suction

on mayo, give bronchodilators if necessary, give a humidifier, regulate fluid intake to optimize balance, monitor respiration and O₂ status.

Nursing Implementation

In carrying out nursing actions, it is adjusted to the problems faced by Mr. T so that the problem can be resolved. Implementation carried out in the ER on March 21 2022 at 15.30 on Mr. T is: Overcoming gas exchange disorders related to ventilation-perfusion imbalance, namely by positioning the client in the high Fowler's position, installing a breathing apparatus with an NRM of 15 liters/minute, administering bronchodilators, and monitoring respiration and O₂ status.

Overcoming ineffective breathing patterns related to decreased lung expansion, namely by positioning the client in a high Fowler's position, installing a breathing apparatus with an NRM of 15 liters/minute, administering bronchodilators, monitoring respiration and O₂ status, monitoring vital signs (BP, pulse, temperature, and RR).

Overcoming ineffective airway clearance related to airway obstruction by monitoring the patient's oxygen status, positioning the client in the high Fowler's position, installing a breathing apparatus with an NRM of 15 liters/minute, administering bronchodilators, monitoring respiration and O₂ status.

Nursing Evaluation

After providing nursing care in the ER to Mr. T March 21 2022 at 17.00 has shown improvement but it is not yet significant. From the nursing problems found, the following evaluation results were obtained:

Gas exchange disorders are related to ventilation-perfusion imbalance, obtained from Mr. T tightness begins to decrease when positioned in the high fowler position. Objective data results: respiratory frequency 24 x/minute, Mr. T installed NRM 15 lpm, saturation after applying NRM is 95%. The problem has not been resolved and the intervention is continuing.

Ineffective breathing patterns are related to decreased lung expansion, obtained from the subjective data of Mr. T said the tightness began to decrease when positioned in the high fowler position. Objective data results: respiratory frequency 24 x/minute, rhonchi audible in breath sounds, Mr. T installed NRM 15 lpm, saturation after applying NRM is 95

%, secretions come out easily after being given the bronchodilator nebulizer Ventolin. Vital sign results are blood pressure 125/80 mmHg, temperature 36.5°C, pulse 100, RR 24 x/minute, oxygen saturation 95%. The problem has not been resolved and the intervention is continuing.

Ineffective airway clearance related to airway obstruction was obtained from the subjective data of Mr. T said that the shortness of breath began to decrease when positioned in the high Fowler's position, secretions came out easily after being given the Ventolin nebulizer bronchodilator. Objective data results: respiratory frequency 24 x/minute, rhonchi audible in breath sounds, Mr. T installed NRM 15 lpm, saturation after applying NRM was 95%, vital sign results blood pressure 125/80 mmHg, temperature 36.5°C, pulse 100, RR 24 x/minute, oxygen saturation 95%. The problem has not been resolved and the intervention is continuing.

From the evaluation results obtained by Mr. T was advised to receive further treatment in the Intensive Care Unit (ICU) from DPJP.

Discussion

Practice Land Profile

This research was carried out at the Hj Bunda Halimah Hospital, Batam in the Emergency Room (IGD). Hj Bunda Halimah Hospital is a private hospital that was founded in 2018 and started serving patients with BPJS health on February 15 2021 and has a motto, namely Our Best for your Health. This hospital is a type C referral hospital, and is a non-teaching hospital and is currently developing into a teaching hospital located on Jalan Uniba No. 5 Batam, Riau Islands.

Therefore, Hj Bunda Halimah Hospital will improve its reputation by improving the quality and health services, including nursing services. This nursing service can be seen from the services provided by all nurses in all rooms at Hj Bunda Halimah Hospital, one of which is in the Emergency Room.

Analysis of Nursing Problems with Related Concepts and Related Case Concepts

During practice at the hospital, students managed one patient, namely Mr. T with a medical diagnosis of COPD. Nursing problems that arise in Mr. T namely impaired gas exchange related to ventilation-perfusion imbalance, ineffective breathing patterns related to decreased lung expansion and ineffective airway clearance related to airway obstruction.

Nursing diagnoses that may appear based on NANDA (North American Nursing Diagnosis Association-International) 2012-2014 in COPD patients are:

Ineffective airway clearance related to excessive amounts of mucus, exudate in the alveoli and bronchospasm

Impaired gas exchange related to carbon dioxide retention Ineffective breathing patterns related to respiratory muscle fatigue

Activity intolerance is related to an imbalance between oxygen supply and demand

From the cases that have been obtained, not all nursing diagnoses appear as described above. The first nursing diagnosis that arises is gas exchange disorders. This is because in patients who have undergone an assessment there are indications for a blood gas analysis (AGD) examination, whereas according to NANDA 2012-2014 the results of the AGD examination are one of the data to confirm the diagnosis of gas exchange disorders.

The indications for AGD according to McCan (2004) are as follows: Blood gas analysis is aimed at patients with pulmonary edema, ARDS, myocardial infarction, pneumonia. Patients who are experiencing shock and after undergoing coronary artery bypass surgery. The patient is undergoing resuscitation from cardiac blockage or inhibition. Patients experiencing changes in respiratory status and respiratory therapy The second nursing diagnosis is an ineffective breathing pattern related to decreased lung expansion, namely a condition where the airway narrows which will cause shortness of breath in the patient

(Brunner & Suddart, 2002). A blocked airway causes shortness of breath, so that expiration is always more difficult and longer than inspiration, which forces the patient to sit up straight, using every accessory respiratory muscle so that pain and heaviness in the chest is felt. Long-term use of untrained accessory respiratory muscles can cause COPD sufferers to become fatigued and have pain when breathing during an attack or during activity (Brunner & Suddart, 2002).

The third nursing diagnosis is ineffective airway clearance related to airway obstruction. Chronic Obstructive Pulmonary Disease (COPD) is a disease characterized by airflow obstruction caused by chronic bronchitis. Airflow obstruction is generally progressive, non-reversible, sometimes followed by airway hyperactivity and sometimes partially reversible. Patients with COPD often experience increased airflow resistance, hyperinflation of the lungs. Lung hyperinflation causes mechanical loss of the inspiratory muscles, resulting in an increased imbalance between respiratory mechanisms, strength and the ability of breathing effort to meet tidal volume (Smeltzer & Bare, 2005).

Under normal circumstances free radicals and antioxidants are in balance. If there is a balance disorder, damage will occur to the lungs. Free radicals have a big role in causing cell damage and are the basis of various kinds of lung diseases.

The influence of free radicals originating from air pollution can induce chronic coughing so that the

bronchial tree becomes infected more easily. Decreased lung function occurs secondary to changes in airway structure. Structural damage in the form of alveoli destruction which leads to emphysema due to excessive production of free radicals by leukocytes and pollution and cigarette smoke. Data obtained from interviews with patients regarding the process of COPD is because the client has a history of respiratory tract infections, as well as old age. This is supported by Gordan (2002) that there are several causes for COPD sufferers or conditions that together give rise to COPD sufferers, namely: as age increases the risk increases, men are more at risk than women, smoking, reduced lung function, even when symptoms of the disease are not felt, exposure to various pollution, any cigarette smoke and dust, air pollution, acute respiratory system infections, such as pneumonia and bronchitis.

The most prominent problem in cases, namely complaints of admission to the Emergency Room (IGD), is shortness of breath, so intervention is needed to reduce shortness of breath in patients.

Analysis of One Intervention with Related Concepts and Research

COPD is characterized by spastic constriction of the smooth muscle of the bronchioles which makes breathing difficult. Airflow obstruction is the main physiological change in COPD which is caused by typical changes in the proximal, peripheral airways, parenchyma and lung vascularization due to chronic inflammation and structural changes in the lungs. There is increased

thickening of the small airways with increased formation of lymphoid follicles and collagen deposition in the outer walls of the airways resulting in restriction of airway opening. The lumen of the small airways is reduced due to thickening of the mucosa containing inflammatory exudate, which increases with the severity of the disease.

Under normal circumstances free radicals and antioxidants are in balance. If there is a disturbance in eating balance, damage to the lungs will occur. Free radicals have a big role in causing cell damage and are the basis of various kinds of lung diseases.

One of nursing's independent actions to maintain gas exchange is to adjust the client's position. This positioning can help the lungs expand optimally, thereby helping to increase gas exchange (Black & Hawks, 2005). The right position can also increase relaxation of additional muscles so that it can reduce breathing effort/dyspnea. Sometimes COPD clients with dyspnea are positioned in a sitting upright position/high fowler position, half sitting/semi fowler position, prone sitting position/sitting forward leaning/orthopneic position. Even the head is only supported by a few pillows (30°-40° extension). Fowler's position or half-sitting is the patient's sleeping position with the head and chest more than the pelvis and legs. In the semi-Fowler position, the head and chest are raised at an angle of 30-45 degrees, while in the high-Fowler position, the head and chest are raised to 45-80 degrees. This position is carried out to maintain comfort and facilitate the patient's breathing.

The high Fowler technique intervention applied to patients to overcome shortness of breath is carried out by positioning the head and chest elevated 45-80 degrees.

The evaluation obtained from Mr. T is a decrease in complaints of shortness of breath felt by the client. In the case of Mr. When T was given the high Fowler position, the client stated that the tightness he felt had begun to decrease from RR 35 x/minute to RR 24 x/minute. The client also showed a calmer expression when using NRM oxygen 15 liters/minute. From this case it can be concluded that giving the high fowler position can reduce shortness of breath in COPD patients.

Alternative solutions that can be done

Nursing problems that arise in managed patients can be overcome if there is good collaboration between patients and health service providers, in this case especially nurses. Patients have an important role in carrying out self-care in improving health and preventing re-hospitalization (Barnason, Zimmerman & Young, 2011). The behavior expected from self-care is compliance with medication and doctor's instructions, such as diet, fluid restrictions and activity restrictions. The trigger for repeated complaints in managed patients is due to a lack of control over the causes of COPD, but how to deal with and first treat the symptoms of shortness of breath is also part of a form of control so that when the patient can overcome it by adjusting his own body position, the patient does not need to go to the hospital again and again. health services which in the end are only given pharmacological therapy and then go home. An alternative that can be done in the Emergency Room to reduce

shortness of breath in COPD patients is by providing health education to COPD patients who experience shortness of breath and first treatment when COPD occurs as well as teaching how to adjust body position when experiencing symptoms.

The advantage of the high fowler technique is that it can be done anywhere and is very simple, only with knowledge of how to position the patient so that he can deal with his own complaints at least in the first treatment. **CONCLUSION**

Based on the results of the analysis and discussion in the previous chapter, it can be concluded that:

Analyzing managed cases with a diagnosis of COPD, the following results were obtained:

Mr. T, 55 years old, the main complaint felt by the client was shortness of breath since 1 day before entering the hospital and became worse this afternoon and was taken to the Emergency Room at 15.20 WIB. On physical examination, it was found that he heard crackles in the lungs and a RR of 35 x/minute.

The nursing diagnoses that emerged were Impaired gas exchange related to ventilation-perfusion imbalance, Ineffective breathing pattern related to decreased lung expansion, Ineffective airway clearance related to airway obstruction.

The interventions provided are in accordance with standards using the Nursing Outcomes Classification (NOC) and Nursing Interventions Classification (NIC).

The nursing implementation will be carried out on March 21 2022, to implement innovations in providing high fowler positions and

measuring the results subjectively and objectively.

Evaluation of nursing problems that have not been resolved are gas exchange disorders, poor breathing patterns, ineffective airway clearance and the client requires further treatment in the Intensive Care Unit (ICU) according to DPJP instructions.

An alternative that can be done in the emergency room to reduce shortness of breath in COPD patients is by providing health education and first treatment when COPD occurs and teaching how to adjust positions that can relax and reduce shortness of breath, one of which is by adjusting the high fowler position. this technique can be done anywhere and is very simple, with only the knowledge of how to adjust the position, the patient can overcome his own complaints at least in the first treatment. This nursing intervention must also receive support from family and closest friends, because support from the family is One of the motivations and part of the success rate of this therapy is when the patient feels complaints and starts to become anxious and panic.

Suggestion For Batam University

It is hoped that the results of this research can be input into learning programs and add to library references as well as become a basis for further nursing research, and as reading material for nursing students to increase knowledge about the use of the high fowler position in COPD.

For Health Professionals

It is hoped that the results of this research can be input for health workers, especially nurses, in carrying out their role as care givers in order to improve the quality of nursing care,

carry out interventions and optimize the provision of high Fowler position techniques in the Emergency Room at Hj Bunda Halimah Hospital so that they can maximize the first treatment of dyspnea in patients with problems with the respiratory system, namely COPD.

For Writers

It is hoped that this research can be an effort by the author to implement nursing care which can improve abilities and apply knowledge about how to treat patients with dyspnea in COPD.

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