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Analysis of Nursing Care COPD Patients with Pursed Lips Breathing on Reduction Shortness Breath at Arifin Achmad Hospital

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Abstract. *Pursed lips breathing is a method that can be used to breathe effectively and get the amount oxygen needed. The benefits of pursed lips breathing or pursed lips breathing are reducing hyperinflation in the lungs by increasing intra-airway pressure to prevent lung collapse and can also increase the speed of respiratory air flow, and optimize the process. The effect of applying pursed lips breathing on reducing shortness of breath. Application Method: This type of application is a quasi-experiment with a pre test-post test design with a control group. The population in this study was patients with chronic obstructive pulmonary disease who experienced shortness of breath when hospitalized. The sample consisted of one person in the intervention group. The instruments used were questionnaires and flip sheet media. Data was collected using a questionnaire and analyzed using descriptive methods. Patients with chronic obstructive pulmonary disease who experienced shortness of breath after being given the intervention experienced a significant reduction in shortness of breath. Pursed lips breathing is a breathing exercise that can be done independently and has an effective effect on reducing shortness of breath in COPD patients.*

Keywords: *Breathing, Pursed lips breathing, Shortness of breath.*

1. INTRODUCTION

Problems or disorders of the respiratory system, especially those related to the lungs, are often the cause of respiratory diseases. The inability of the lungs to expand and work through the airways to create airflow indicates impaired lung function (Damansyah et al., 2023).

Chronic obstructive pulmonary disease (COPD) is one of several groups of non-communicable diseases whose airway obstruction is caused by persistent and progressive chronic inflammation (Situmorang et al., 2023). The causes of chronic obstructive pulmonary disease (COPD) are air pollution due to combustion, cigarette smoke, and toxic gas particles (Silalahi & Siregar, 2019).

In general, the symptoms that often appear in patients with COPD are coughing, shortness of breath and airway obstruction (Arief Sulistyanto et al., 2023). Shortness of breath can be defined as difficulty breathing. Breathing difficulties occur when the supply of inhaled oxygen is reduced, the transport of oxygen from outside to the tissue is impaired, and the use of oxygen by cells is impaired (Muhammad & Aini, 2021).

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If you do not seek immediate medical attention for chronic dyspnea, you may experience cyanosis (pallor), fatigue and weakness. Further airway obstruction will result in airway blockage (obstruction) if not treated immediately (Ramli et al., 2023). The typical respiratory rate falls between 14 and 20 times per minute, while the abnormal respiratory rate falls between 10 and 26 times per minute. Respiratory rate is influenced by age, gender, posture, and body temperature (Muhammad & Aini, 2021).

According to World Health Organization (WHO) projections, COPD is expected to become the third leading cause of death globally by 2030. It is conceivable that COPD will claim the lives of more than 3 million people in 2020 (Situmorang et al., 2023). According to estimates, the prevalence of COPD in Southeast Asian countries is 6.3%, with China (6.5%) and Vietnam (6.7%) having the highest rates. East Nusa Tenggara has the highest COPD prevalence rate in Indonesia (10.0%), followed by Central Sulawesi (8.0%), West Sulawesi (6.7%), and South Sulawesi (6.7%) (Sitorus, 2021).In addition, Pekanbaru has an average COPD prevalence rate of 3.6 (Situmorang et al., 2023).

Based on data on COPD patients who have been treated for the last 3 from medical record data at the Arifin Achmad Regional General Hospital (RSUD) Riau Province, there has been an increase from 2020 to 2022, the number of COPD patient cases in 2020 was 414 people, in 2021 the number of COPD patient cases was 512 people and in 2022 the number of COPD cases was 389 people. And the cases of COPD patients at Arifin Achmad Hospital Riau Province are among the 4 largest diseases out of 15 lung diseases. This shows that COPD patients are experiencing an increase in health problems.

Patients with COPD will gradually experience damage to alveolar ventilation, resulting in hypoxia and hypercapnia. This can also lead to respiratory acidosis, which causes dilation of airways and air spaces, decreased lung compliances and airway collapse, and requires additional respiratory muscle activity. The inability to access normal air due to airway obstruction can cause the lung to collapse easily and will eventually lead to a decrease in peak expiratory flow (Agreta et al., 2023).

To prevent and reduce long-term symptoms in patients with COPD. In addition to pharmacological treatment, there is also non-pharmacological treatment. However, there are many non-pharmacological treatments to reduce shortness of breath and improve quality of life (Karniati & Kristinawati, 2023). One of the non-pharmacological treatments is pursed lips breathing exercises or lip breathing exercises (Supardi et al., 2023).

By opening the alveoli and increasing the amount of oxygen reaching the lungs, pursed lip breathing, also known as the pursed lip breathing method, can improve respiratory performance. Kristinawati and Karnati, 2023. Retracting the lips and breathing by keeping the airway open can be beneficial for patients experiencing symptoms and discomfort, according to Muhammad & Aini (2021). Conical lip breathing is a type of breathing exercise that involves two different mechanisms: full, deep breathing and energized free breathing (Silalahi & Siregar, 2019).

Pursed lips breathing teaches to exhale more slowly, making breathing easier and more comfortable at rest or during activities, and can reduce respiratory muscle spasm, smooth the airway, and open the airway so as to increase the airway breathing rate and increase airway work capacity (Aceh et al., 2023).

According to Sachdeva et al (2014) the benefits of pursed lips breathing are to reduce hyperinflation in the lungs by increasing intra airway pressure to prevent lung collapse and can also increase the speed of respiratory airflow, and optimize the process. Exchanging carbon dioxide with oxygen faster, helps reduce shortness of breath in COPD patients. Oxygen in the body is increased by lip breathing exercises, which can be further optimized by strengthening respiratory muscle function (Rosyadi et al., 2019).

The initial impact of shortness of breath if not addressed in COPD patients is only when the patient is doing strenuous activities. But over time, shortness of breath will gradually worsen until it causes shortness of breath even if only doing light activities, even just daily activities In advanced stages, shortness of breath will appear even when the patient is resting. Andayani et al's research on the quality of life of COPD patients at RSUDZA Banda Aceh using the Saint George's Respiratory Questionnaire for COPD (SGRQ-C) and mMRC showed that the higher the degree of shortness of breath, the lower the patient's quality of life (Nadiya Aliyah Roselyn et al., 2023).

Previous research explains that the pursed lips breathing technique is proven to be significantly effective in reducing the respiratory rate in COPD patients. The pursed lips breathing technique was performed routinely twice a day with a duration of 30 minutes. On the first day of implementation, the average reduction was 2.5 breaths/min and patients reported more regular breathing and less shortness of breath. The second day of application showed an average reduction of 2 breaths/minute and the patient's shortness of breath also decreased and the patient no longer felt anxious. On the third day of use, the average reduction was 3 beats per minute and patients reported feeling more comfortable, relaxed and shortness of breath reduced (Karniati & Kristinawati, 2023).

Based on previous research, it can be concluded that the application of pursed lips breathing can help reduce shortness of breath in patients with COPD. So that patients with COPD can independently carry out the application of pursed lip breathing when at home (Ramadhani et al., 2022). The research is also supported by pursed lips breathing which has an improving effect on oxygen saturation and respiratory rate (Arief Sulistyanto et al., 2023). The pursed lips breathing technique also has a significant effect in improving the quality of life of COPD patients (Haerul. & Arif Mansur, 2021).

According to research by Silalahi & Siregar (2019), individuals who experience breathing difficulties were shown to benefit from coned lip breathing treatment. This type of therapy was given for 15 minutes for four consecutive days. The significance value of p-value $< \alpha$ (0.05) with a Z value of -2.646 indicates that H0 is rejected and Ha is accepted, indicating that pursed lip breathing has an impact on reducing shortness of breath in patients with chronic obstructive pulmonary disease (COPD).

Based on the above background, young nurses are interested in applying the results of research on the provision of pursed lips breathing to reduce shortness of breath as outlined in the Final Scientific Work of Ners (KIAN) with the title "Nursing Care Analysis in Chronic Obstructive Pulmonary Disease (COPD) Patients with the Application of Pursed Lips Breathing to Reduce Shortness of Breath in the Integrated Lung Jasmin Room at Arifin Achmad Hospital Riau Province".

2. THEORETICAL STUDIES

One group of non-communicable diseases known as chronic obstructive pulmonary disease (COPD) is a public health problem that causes long-term inflammation of the lungs and respiratory system. It is characterized by progressive and sustained blockage of the respiratory system in reaction to harmful particles or gases (Situmorang et al., 2023).

Shortness of breath is a symptom of chronic obstructive pulmonary disease (COPD), a progressive lung condition that poses a major risk to one's life and increases the likelihood of exacerbations and more serious illness (Ramadhani et al., 2022). Reduced alveolar ventilation, which results in hypoxia and hypercapnia and respiratory acidosis, which increases breathing and the use of respiratory muscles, are common occurrences in COPD patients. Lack of oxygen in the body will result in lactic acid metabolism in the muscles, which will deplete the muscles. Muscle fatigue affects the respiratory system. This condition causes COPD patients to have a fundamental weakness in achieving normal expiratory airflow values. The inability to get normal air due to airway obstruction can cause pulmonary airway obstruction and improve quality of life (Pujiati & Suherni, 2023).

3. RESEARCH METHODS

In this chapter the author explains in detail, related to the Evidence Based Nursing Practice (EBNP) method that will be applied by researchers, namely explaining related interventions based on EBNP, Problem / Population analysis, Intervention, comparison, Outcome / results and Time / Time (PICOT). Standard Operating Procedures (SOP), evaluation of implementation and research ethics.

The intervention in this application is the provision of pursed lips breathing therapy to reduce shortness of breath. The research that is the basis for the application of this intervention is the research of Silalahi & Siregar (2019) with a Quasi experimental pre and posttest research design. The research was conducted at RSU Royal Prima Medan with a population 8 patients suffering from chronic obstructive pulmonary disease (COPD) at RSU Royal Prima Medan in 2018. The implementation of the intervention was carried out using the pursed lips breathing SOP, the modified medical research council instrument (mMRC Dyspnea Scale), and a watch to measure respiratory frequency. The intervention was carried out on 1 person who would be given the intervention of applying pursed lips breathing. This intervention was carried out 4 times a week in the morning.

PICOT Analysis Results.

Pursed lips breathing is a breathing exercise that uses slow and deep breathing techniques, using the chest muscles, to fully develop the chest to reduce shortness of breath (Silalahi & Siregar, 2019). The purpose of pursed lips breathing is to regulate breathing frequency and breathing patterns to reduce air trapping, increase alveoli ventilation, increase gas exchange without increasing the work of breathing, regulate breathing for more effective breathing and reduce shortness of breath. Followed by the pre-interaction stage where the patient's status is checked, equipment preparation, environmental care preparation (nurses limit visitors). Followed by the orientation stage of greeting, self-introduction and patient identification using at least two identities (full name, date of birth, and or media record number), then explaining the purpose, benefits, procedures, and duration of pursed lips breathing given to patients for 15 minutes, then giving patients the opportunity to ask questions, ask the patient to sign an informed consent sheet (for willing respondents). Assess the patient's Respiratory rate for 1 minute, and assess the shortness of breath scale using the modified medical research council scale (mMRC Dyspnea Scale) (5 minutes before the intervention is given).

Inclusion criteria for the selected respondents are: 1.COPD patient with complaints of shortness of breath.2.COPD patients with co-morbidities such as respiratory infections, heart disease, lung cancer and high blood pressure. 3.Patients with respiratory frequency >20x/m. 4.Patients who can communicate well and have no hearing loss. 5.Patients who are willing to be respondents. The exclusion criteria were: The patient is not cooperative. COPD patients with hyperventilation syndrome and Patients with oral defects (cleft lip).

Ethics in nursing research is directly related to humans, so we must pay attention to ethical aspects in research. This research has passed the ethical test at the health research ethics commission (KEPK) at Hang Tuah University Pekanbaru with Number: 035/KEPK/UHTP/VI/2024.

4. RESULTS AND DISCUSSION

Mr. M's Nursing Care

The shortness of breath has been felt for the last 3 months. Shortness of breath is felt occasionally and aggravated by exertion, lying down and when coughing. Cough without phlegm has been felt for the last 7 months, chest pain has disappeared in the last 3 months, nausea, heartburn, hoarseness in the last 3 months. The patient also complained of body weakness, decreased appetite. Patients also complain of pain in the epigastrium when doing activities increasingly feels like stabbing, pain scale 4 (moderate). The patient feels the pain is lost and arises, if the pain is felt 2-3 minutes. The patient's previous medical history had experienced hypertension for a long time and took hypertension medication but not regularly. History of COPD in February 2024. Patient's habits have a habit of smoking since 30 years ago, spending 4 packs a day and drinking coffee regularly and drinking alcohol. General condition of the patient with consciousness / GCS: Composmentis / 15 (E:4 M:6 V:5). The results of the examination of vital signs obtained the results of BP: 171/117 mmHg HR: 108 x/min RR: 28x/min S: 36.5ºC BB: 57 kg TB: 150 cm, BMI: 25.3 $kg/m2$ (fat). The patient was attached to an O2 nasal cannula of 5 liters/minute, an IV was attached to the left hand with 0.9% NaCl liquid (500cc/8 hours). The patient has a history of food allergies, namely shrimp and has no drug allergies. The patient's activity pattern is assisted by family.

The assessment carried out on May 31, 2024 obtained Mr.M's general condition with composmentis consciousness, GCS 15. A focused examination was obtained in the nose obtained a breathing device (nasal cannula 5 lpm), NGT (-), bleeding (-). Examination of the chest was obtained chest wall retraction / breathing muscles (+), symmetrical chest shape, no lumps / masses, no tenderness, no palpable nodules / masses, no swelling of the patient's chest, right left hypersonor, additional breath sounds were heard, namely wheezing, in cardiac

examination there is a symmetrical chest shape, no tenderness, palpable ictus cordis in mid clavicle intercostal 4-5, S1-S2 lup dup. On abdominal examination, the surface of the abdominal wall has no lesions, there is no swelling, intestinal noise is heard 10 x/min, no friction rub sound is heard and there is no water sound when movement is performed, percussion tympanic sound in the abdominal field, there is no tenderness.

Results of Labor, Radiology, and Echocardiography

a. Labor inspection results on May 28, 2024

Hb 14.7 g/dl (normal 14.0-18.0 g/dl), Leukocytes 9.83 10^3/µL (normal 4.80-10.80 10^3/µL), Platelets 378 10^3/µL (normal 150-450), Erythrocytes 5.43 10^6/µL (normal 4.70-6.10 10^6/µL), Hematocrit 43.3% (normal 42.0-52.0%), PT 13.6 sec. (normal 11.6-14.5 seconds), APTT 29.0 seconds (normal 28.6-42.2 seconds), low Albumin 3.0 g/dL (normal 3.4-4.8 g/dL), AST 32 U/L (normal 10-40 U/L), ALT 38 U/L (normal 10-40), Sewage Blood Glucose 109 mg/dL (normal 100-199 mg/dL), Ureum 39.0 mg/dL (normal 12.8-42.8 mg/dL), Creatinine 0.74 mg/dL (normal 0.60-1.30 mg/dL), pH 7.42 (normal 7.35-7.45), pCO2 44 Mmhg (normal 34-45 Mmhg), pO2 44 Mmhg low (normal 80-100 Mmhg), HCO3 29 mmol/L high (normal 22-26 mmol/L), TCO2 30 mmol (normal 24-30 mmol), BE 4 high (normal -2)-(+2)), SO2C 81%. high (normal >95%).

b. Radiology Results

Radiologic examination Cor normal size and shape, Pulmo normal bronchovascular pattern. There is a rounded homogeneous opacity in the paracardial sinistra. There is homogeneous opacity in the laterosuperior aspect dextra with osteodestruction of costae 3 in the lateral aspect dextra. Bilateral costophrenic sinuses are acute. Bilateral diaphragms are smooth. Impression: Cor within normal limits, Pulmo susp pulmo mass sinistra. Suspect with metastases in laterosuperior aspect destra with osteodestruction of costae 3 lateral aspect dextra.

c. Echocardiography Examination Results

Echocardiography examination resulted in an EF of 62%.vg. According to the American collede of cardiology (ACC) the normal range for Echocardiography is 50% to 70% (midpoint 60%). (Kosaraju, Goyal, Grrigorova, Makaryus. 2023).

The first data analysis on Mr.M obtained subjective data, the patient said that shortness of breath had been felt for the last 3 months, the patient said that when breathing the chest was pinched, while the objective data obtained appeared chest retraction, the patient appeared to use nasal breathing, the patient looked restless, the patient used a 5 liter / minute nala cannula breathing apparatus, BP: 171/117 mmHg RR: 28x / m HR: 108 x / m S: 36.5 ° C, the patient

received pharmacological therapy Acetylestysteine 3x200 mg, Nebu farbivent 2.5mg: Busdema 0.5mg / 8 hours. In the results of the first data analysis, the diagnosis of Ineffective Breathing Patterns b / d Breathing Effort Obstacles was established, the patient said that shortness of breath was felt in the last 3 months, the patient said that when breathing the chest was pinched, chest retraction appeared, the patient appeared to use nasal breathing.

The results of the second data analysis on Mr. M obtained subjective data, the patient said that shortness of breath was felt occasionally and aggravated if the patient was on the move, lying down and coughing, the family said that the patient went to the bathroom assisted by the family using a wheelchair, the patient complained of fatigue, objective data obtained the patient looked weak, the patient seemed short of breath during activity, BP: 171/117 RR: 28x/m HR: 108x/m. In the results of the second data analysis obtained, a diagnosis was made, namely Activity Intolerance b / d Imbalance between supply and oxygen demand d / d the patient said that shortness of breath was felt occasionally and worsened if the patient was on the move, lying down and coughing, the patient complained of fatigue, the patient looked tired, the patient appeared short of breath during activity.

The results of the third data analysis on Mr.M are subjective data obtained, the patient said he had no appetite and nausea, the patient complained of pain in the epigastrium when doing activities increasingly felt like being stabbed and objective data appeared dry and pale lip mucosa, epigastric tenderness, appeared to be half a portion food spent, BB before illness 57kg TB: 150 cm BMI: 25.33 (kg /m 2) normal weight category, 26x / minute intestinal noise, albumin laboratory results 3.0 g / dL (08-06-2024). In the results of the third data analysis obtained, a diagnosis was made, namely Risk of Nutritional Deficit d / d the patient said he had no appetite and nausea, the patient complained of pain in the epigastrium when doing activities felt more like being stabbed, the mucous lips looked dry and pale, the portion of food spent was half a portion, bowel noise 26x / min, albumin 3.0 g / dL.

Based on the results of the assessment on Mr.M obtained nursing problems, Ineffective Breathing Patterns, Activity Intolerance and Risk of Nutritional Deficits, the nursing care plan that has been compiled is as follows: Diagnosis 1: Ineffective Breathing Patterns (D.0008 Ineffective Breathing Patterns b / d Breathing Effort Obstacles d / d the patient said that shortness of breath was felt in the last 3 months, the patient said that when breathing the chest was pinched, chest retraction appeared, the patient appeared to use nasal breathing. In the standard nursing outcomes on Breathing Patterns (L.01004) After taking nursing action for 1x24 hours, it is expected that breathing patterns will improve with the outcome criteria: (1)

Dyspnea decreased (2) Respiratory muscle use decreased (3) Nasal lobe breathing decreased (4) Respiratory frequency improved.

After planning nursing care, then carry out implementation of the main diagnosis, namely Ineffective Breathing Patterns by implementing monitoring breathing patterns (frequency, depth, effort), monitoring additional breath sounds (wheezing), positioning fowler, providing oxygen, teaching pursed lips breathing techniques, collaborating with the administration of bronchodilators, namely Nebu farbivent & Busdema (/8 hours) via inhalation.

Implementation based on EBN is the application of pursed lips breathing about breathing exercises with the aim of reducing shortness of breath, to improve the function of the respiratory muscles, to regulate the oxygenation process in the body better. Implementation is carried out in only 4 days, then data is collected using a shortness of breath scale and analyzed using descriptive methods to see if there is an effect of giving pursed lips breathing in reducing shortness of breath in COPD patients before and after implementation. Before the author carried out the implementation, the researcher asked for approval in the form of informant consent.

Determining respondents according to the inclusion and exclusion criteria. After that the researcher starts from the pre-interaction stage, the orientation stage of the work stage, namely identifying medical records, validating the feelings of nurses, preparing tools and materials, saying greetings, self-introduction and patient identification using at least two identities (full name, date of birth, and / or media record number), explain the purpose, benefits, procedures, explain the purpose, benefits, procedures, and duration of pursed lips breathing given to the patient for 15 minutes, give the patient the opportunity to ask questions, ask the patient to sign an informed consent sheet (for willing respondents), assess the patient's Respiratory rate for 1 minute, and assess the breathlessness scale using the modified medical research council scale (MMRC Dyspnea Scale) (5 minutes before the intervention is given) pre test, then : wash hands, maintain patient privacy, position the patient sitting upright in a bed or chair, instruct the patient to relax the shoulders and neck, with the mouth closed, inhale slowly through the nose for 2 seconds, exhale slowly while the lips are pursed, like whistling slowly for 4 seconds, do it again.

Breathing exercises for 15 minutes with a duration of 1 break for 5 minutes or reduced shortness of breath, washing hands. Then evaluate the patient' feelings and actions taken, evaluate the patient's respiratory rate after taking action for 1 minute, evaluate shortness of breath using the modified medical research council scale (mMRC Dyspnea Scale), then the evaluation stage. Implementation is carried out in accordance with the SOP.

Table 1 Evaluation of Shortness of Breath Scale Results and Average Breathing Frequency from the first day to the fourth day Mr. M

No.	Implementation Day	Shortness of breath scale Pre-test	Breath Frequency Pre-test	Post-test Dyspnea Scale	Post-test Breath Frequency
1.	Day-1	2	28	2	26
2.	Day-2	2	27	2	23
3.	Day 3	2	26	1	22
4.	Day-4	1	24	0	20
Average:			Pre-Test: 26.25		Pre-Post: 22.75

Evaluation of the application of *pursed lips breathing* in overcoming problems in ineffective breathing patterns focused on the frequency of breathing from the first day to the fourth day of the *pre-test* and the first day to the fourth day of the *post-test* obtained an average of the first day-fourth day of *the pre-test of* 26.22, while the first day-fourth day of the *post-test* was 22.75. Which shows a significant change but this decrease is also supported by pharmacological therapy.

In the standard of airway management nursing interventions (I.01011), namely (1) Monitor *breathing* patterns (frequency, depth, effort), (2) Monitor additional breath sounds (*wheezing*), (3) maintain airway patency, (4) Position semi fowler / fowler, (5) Give oxygen (6) Teach *pursed lips breathing* techniques, (7) Collaborate on bronchodilator administration.

Discussion

Case Concept Based Analysis.

Nursing assessment

Based on a case managed by a patient on behalf of Mr. M aged 48 years with male gender with a medical diagnosis of chronic obstructive pulmonary disease, it was found that the patient with a complaint about the history of the current disease in Mr. M, the patient said that shortness of breath was felt occasionally and worsened when doing activities, lying down and when coughing, the patient also complained of weakness, decreased appetite, the patient also complained of pain in the epigastrium when doing activities increasingly felt like being stabbed, pain scale 4 (moderate). The patient feels the pain is lost and arises, if the pain is felt 2-3 minutes. Habits The patient has a habit of smoking since 30 years ago, spending 4 packs a day.

According to GOLD, 2017 The typical symptom of COPD patients is complaints of shortness of breath with various characteristics. People with COPD begin to notice shortness of breath when doing strenuous exercise. This tends to be tolerated for many years until it becomes gradually worse. The longer complaints of shortness of breath can occur in lighter activities, daily activities such as household chores (Dewi et al., 2022).

In the case obtained, it was also said that the patient had a smoking habit since 30 years ago, spending 4 packs a day. This habit is one of the triggers for patients suffering from COPD. In accordance with the theory where, Cigarette smoke exposure is the most common risk factor found in COPD patients worldwide. The result of complex interactions from long-term cumulative exposure to harmful gases and particles then coupled with various host factors including genetics, airway hyperresponsiveness, and poor lung development during childhood will be able to cause airway mucosal disorders and changes. (Dewi et al., 2022).

Old age can cause COPD because in elderly patients the respiratory system has decreased endurance and a decrease in the chest wall causes reduced chest wall compliance and there is a decrease in the elasticity of the lung parenchyma, increased mucous glands and thickening of the bronchial mucosa. Based on the theory that COPD often occurs in men than women. This is confirmed by the Basic Health Research (Riskesdas) that the prevalence of COPD is higher in men than women.

This is due to smoking and a greater risk of workplace exposure (Adiana & Maha Putra, 2023).

According to Volkers (2019) COPD patients tend to experience malnutrition and weight loss. This can be caused by an imbalance between the energy entering the body and the energy used by the patient. In severe COPD patients, kakeksia can generally occur. This is due to loss of skeletal muscle mass and weakness as a result of increased apoptosis and or disuse of these muscles (Kurniyanti et al., 2023).

Based on the signs and symptoms in accordance with the case, the patient experiences shortness of breath when lying down, this is in accordance with the results of research according to Angela (2008) which states, when shortness of breath occurs, clients usually cannot sleep in a lying position, but must be in a sitting or semi-sitting position to relieve airway narrowing and fulfill O2 in the blood. The most effective position for clients with cardiopulmonary disease is the semi-fowler position where the head and body are raised to a degree of 45 ° tilt, which is to use the force of gravity to help lung development and reduce pressure from the abdomen to the diaphragm (Ardenny & Agus, 2022).

Data Analysis

The first data analysis on Mr.M obtained subjective data, the patient said that shortness of breath had been felt for the last 3 months, the patient said that when breathing the chest was pinched, while the objective data obtained appeared chest retraction, the patient appeared to use nasal breathing, the patient looked restless, the patient used a 5 liter / minute nala cannula breathing apparatus, BP: 171/117 mmHg RR: 28x / m HR: 108 x / m S: 36.5 ° C, the patient

received pharmacological therapy Acetylestysteine 3x200 mg, Nebu farbivent 2.5mg: Busdema 0.5mg / 8 hours. In the results of the first data analysis, the diagnosis of Ineffective Breathing Patterns b / d Breathing Effort Obstacles was established, the patient said that shortness of breath was felt in the last 3 months, the patient said that when breathing the chest was pinched, chest retraction appeared, the patient appeared to use nasal breathing.

The diagnosis of ineffective breathing patterns is in accordance with the case and the signs and symptoms of the diagnoses raised are in accordance with the theory with the following explanation. The main problem that often occurs in patients with chronic obstructive pulmonary disease (COPD) is caused by respiratory tract obstruction that is not fully reversible, blockage of airflow. It is generally progressive and associated with an abnormal inflammatory response in the lungs to harmful particles or gases (Widiasari & Nurlaily, 2023).

The results of the second data analysis on Mr. M obtained subjective data, the patient said that shortness of breath was felt occasionally and aggravated if the patient was on the move, lying down and coughing, the family said that the patient went to the bathroom assisted by the family using a wheelchair, the patient complained of fatigue, objective data obtained the patient looked weak, the patient seemed short of breath during activity, BP: 171/117 RR: 28x/m HR: 108x/m. In the results of the second data analysis obtained, the second diagnosis is Activity Intolerance b / d Imbalance between supply and oxygen demand d / d the patient said that shortness of breath was felt occasionally and worsened if the patient was on the move, lying down and coughing, the patient complained of fatigue, the patient looked tired, the patient appeared short of breath during activity.

In patients with COPD there are mechanical disorders and gas exchange in the respiratory system and result in decreased physical activity and daily life. Continuous obstructive conditions of the respiratory tract will cause the diaphragm to flatten, impaired contraction of the respiratory tract, resulting in continuous use of intercostal muscles and additional inspiratory muscles, causing symptoms of shortness of breath in COPD patients (Handayani Siburian et al., 2022). Dyspnea during activity will be one of the factors that reduce the endurance of COPD patients in carrying out physical activities from other normal people (Rosyadi et al., 2019).

The results of the third data analysis on Mr.M are subjective data obtained, the patient said he had no appetite and nausea, the patient complained of pain in the epigastrium when doing activities increasingly felt like being stabbed and objective data appeared dry and pale lip mucosa, epigastric tenderness, appeared to be half a portion food spent, BB before illness 57kg TB: 150 cm BMI: 25.33 (kg /m 2) normal weight category, 26x / minute intestinal noise,

albumin laboratory results 3.0 g / dL (08-06-2024). In the results of the third data analysis obtained, a diagnosis was made, namely Risk of Nutritional Deficits d / d the patient said he had no appetite and nausea, the patient complained of pain in the epigastrium when doing activities felt more like being stabbed, the mucous lips looked dry and pale, the portion of food spent was half a portion, bowel noise 26x / min, albumin 3.0 g / dL.

The pathogenesis of weight loss in COPD patients is unclear. However, increased breathing effort and respiratory muscle activity can increase resting energy expenditure by 50-100% above normal. Insufficient nutritional intake. COPD can be associated with airway obstructive severity and low VEP1 and KVP which can directly correlate with increased mortality and morbidity. COPD patients tend to experience malnutrition and weight loss. (Kurniyanti et al., 2023).

Nursing Interventions

Based on the theory in the nursing intervention section for patients with diagnoses of ineffective breathing patterns that can be done, namely airway management, the same as interventions based on cases written by the author including: monitor breathing patterns (frequency, depth, breath effort), monitor additional breath sounds (wheezing), maintain airway patency, position semi fowler / fowler, provide oxygen, teach pursed lips breathing techniques, collaborate in the administration of bronchodilators, expectorants, mucolytics, if necessary.

Oxygen therapy is a treatment where the oxygen concentration is higher than the outdoor oxygen concentration. Oxygen is a gaseous component that is essential for human life. Oxygen therapy is also known as supplemental oxygen and is only needed if a person does not get enough oxygen to meet the body's needs. People will feel safe and comfortable when breathing if their body's oxygen needs are met (Sahrudi & Ameilia, 2024). According to Amalia & Wiriansya, (2022) In patients with chronic obstructive pulmonary disease (COPD), providing oxygen concentration (O2) can reduce shortness of breath during activities, increase functional capacity and improve quality of life. Kozier's theory states that when a patient with dyspnea is placed in the semi fowler position gravity will pull the diaphragm down, allowing for greater chest expansion and better ventilation of the lungs. As the chest expands and the blood pressure on the diaphragm decreases, the amount of oxygen in the lungs also increases. Increased oxygen to the lungs helps to reduce shortness of breath, at the same time, increasing oxygen saturation and reducing damage to the alveolar membrane due to fluid build-up, helping the client's condition improve faster. Giving semi-fowler sleeping position can increase the value of oxygen saturation in patients with congestive heart failure (CHF).

In patients with chronic obstructive pulmonary disease (COPD), the semi fowler position can reduce dyspnea and will improve pulmonary compliance because the semi fowler position which has a slope of 30° to 45° can help lung development, and reduce abdominal pressure from the diaphragm using only gravity (Astriani et al., 2021).

Based on the theory in the nursing intervention section for patients with a diagnosis of activation intolerance that can be done, namely energy management consists of identifying impaired body functions that result in fatigue, monitoring physical and emotional fatigue, monitoring sleep patterns and hours, monitoring location and discomfort during activity, facilitating sitting on the side of the bed, if unable to move or walk, encourage gradual activity, collaboration with nutritionists on how to increase food intake.

In patients with COPD, there are mechanical and gas exchange disorders in the respiratory system, leading to reduced daily physical activity. The body's compensatory mechanisms in this condition lead to hyperventilation and hyperinflation, reducing respiratory capacity and causing breathing difficulties. Many COPD patients report experiencing sleep problems and fatigue more often than the general healthy population. Dyspnea during sleep causes the reticular activating system (RAS) to increase and release catecholamines such as norepinephrine, causing patients to wake up and leading to sleep disturbances (Handayani Siburian et al., 2022).

Based on the theory in the nursing intervention section for patients with nutritional deficit risk diagnoses that can be done is nutritional management, which consists of identifying nutritional status, identifying food allergies and intolerances, identifying preferred foods, monitoring food intake, monitoring body weight, monitoring laboratory results, giving high-fiber foods to prevent constipation, giving food supplements, teaching a programmed diet, collaborating with a nutritionist to determine the number of calories and types of nutrients needed.

Patients with COPD often experience loss. Reduced food intake in COPD patients is caused by several factors including shortness of breath after eating, fast satiety, weakness and loss of appetite. In patients with COPD, there is also an increase in energy expenditure triggered by several factors, namely increased respiratory effort and systemic inflammatory response. The systemic inflammatory response is triggered by the release of inflammatory cytokines that are dominant in COPD patients, especially tumor necrosis factor-α (TNF-α) and interleukin-6 (IL-6) in respiratory muscles and limb muscles. The resulting systemic inflammatory response can cause structural changes and degradation of proteins and diaphragm and other skeletal muscles through ubiquitin-proteasome proteolytic mechanisms. Protein breakdown that is not

matched by synthesis causes structural changes and decreases respiratory muscle strength and endurance. This may affect VEP1/KVP test results as the systemic effects of COPD lead to reduced strength and endurance. skeletal muscle and diaphragm resistance which ultimately leads to the inability to initiate forced breathing (Meilinda et al., 2022).

COPD patients lose more muscle mass, resulting in more weight loss. Malnutrition can be alleviated by feeding a balanced diet. The amount of nutrients that can be consumed in small portions and the intensity of use is more frequent. High carbohydrate and protein intake (TKTP) is recommended to prevent malnutrition in COPD patients (Husnah, 2020). Several studies have shown that obese people have decreased lung capacity, leading to decreased vital lung capacity (VLC) (Fattah et al., 2022).

Nursing Implementation

The implementation given to patients is the application of *pursed lips breathing* to reduce shortness of breath in patients with chronic obstructive pulmonary disease. The application is carried out for 4 days with therapy for 15 minutes. In research conducted by Silalahi & Siregar, (2019) related to the Effect of *Pulsed Lip Breathing Exercise* on Decreasing Shortness of Breath in Chronic Obstructive Pulmonary Disease (COPD) Patients at the Royal Prima Medan Hospital 2018, the results of *pursed lips breathing* therapy were effective in reducing symptoms of shortness of breath in patients with chronic obstructive pulmonary disease.

Pursed lips breathing is a *breathing control* that can cause a feeling of comfort or relaxation and reduce shortness of breath in COPD patients. *Pursed lips breathing* can also improve gas exchange (Ndary et al., 2023). *Pursed lips breathing* teaches to exhale more slowly, making breathing easier and more comfortable at rest or during activities, and can reduce respiratory muscle spasm, smooth the airway, and open the airway so as to increase the airway breathing rate and increase airway work capacity (Aceh et al., 2023). According to Sachdeva *et al* (2014) the benefits of *pursed lips breathing* are to reduce hyperinflation in the lungs by increasing intra airway pressure to prevent lung collapse and can also increase the speed of respiratory airflow, and optimize the process. Exchanging carbon dioxide with oxygen faster, helps reduce shortness of breath in COPD patients. Oxygen in the body improved by lip breathing exercises, which can be further optimized by strengthening respiratory muscle function (Rosyadi et al., 2019).

Nursing Evaluation

Nursing evaluation is an activity in assessing predetermined actions to determine the optimal fulfillment of patient needs and measure the results of the nursing process. In the application of *Pursed Lips Breathing* (PLB) evaluation related to the decrease in shortness of breath felt in patients with chronic obstructive pulmonary disease (COPD) on the nursing problem of Ineffective Breathing Patterns.

Evaluation of the application of *pursed lips breathing* in overcoming problems in ineffective breathing patterns focused on the frequency of breathing from the first day to the fourth day of the pre-test and the first day to the fourth day of the post-test obtained an average of the first day-fourth day of the pre-test of 26.22, while the first day-fourth day of the post-test was 22.75. Which shows a significant change but this decrease is also supported by pharmacological therapy.

So it can be concluded that after the application of 4 days for 15 minutes in chronic obstructive pulmonary disease (COPD) patients who experience shortness of breath has an effect on reducing the respiratory frequency of chronic obstructive pulmonary disease (COPD) patients who experience shortness of breath. , the application of *pursed lips breathing* can be utilized by nurses and other health workers to overcome symptoms of shortness of breath in chronic obstructive pulmonary disease (COPD) patients who experience shortness of breath.

Based on this explanation, it can be concluded that *pursed lips breathing* therapy has an effect on shortness of breath with the collaboration of the use of drugs in reducing shortness of breath in patients with chronic obstructive pulmonary disease.

Analysis by Application Intervention

The results of the application of *pursed lips breathing* therapy to reduce shortness of breath are seen in table 4.1 Evaluation of Shortness of Breath Scale Results and Respiratory Frequency.

Table 2 Evaluation of Shortness of Breath Scale Results and Average Breathing Frequency from day one to day four Mr. M

No.	Implementation Day	Shortness of breath scale Pre-test	Breath Frequency Pre-test	Post-test Dyspnea Scale	Post-test Breath Frequency
1.	Day-1	2	28	2	26
2.	Day-2	2	27	2	23
3.	Day 3	2	26	1	22

After being given the application of *pursed lips breathing* in overcoming problems in ineffective breathing patterns focused on breathing frequency from the first day to the fourth day of the pre-test and the first day to the fourth day of the post-test, the average of the first dayday of the pre-test was 26.22, while the first day-fourth day of the post-test was 22.75.

Based on research conducted by Silalahi & Siregar, (2019) related to the effect of *pursed lips breathing* on reducing shortness of breath in patients with chronic obstructive pulmonary disease (COPD) at the Royal Medan Hospital, it was found that *pursed lips breathing* therapy was effectively applied to improve shortness of breath.

Pursed Lips Breathing Therapy is able to increase the speed of expiratory airflow which is able to optimize the process of exchanging carbon dioxide with oxygen to be faster, so as to reduce the shortness of breath of COPD patients. Where the oxygenation process in the body becomes better with the *pursed lips breathing* exercise. This can be more effective by improving the functions of the respiratory muscles, especially the diaphragm muscles (Rosyadi et al., 2019).

Pursed lips breathing is one of the non-pharmacological therapies that nurses can do in reducing shortness of breath in COPD patients. Where this exercise trains breathing which emphasizes the expiratory process which is carried out in a relaxed and calm manner with the aim of facilitating the process of expelling air trapped by the airway, and *pursed lips breathing* therapy is a very easy way to do, without the need for any tools and also without negative effects such as the use of drugs (Islami & Suyanto, 2020).

5. CONCLUSIONS AND SUGGESTIONS

Based on the analysis of nursing care for Mr.M, a patient with chronic obstructive pulmonary disease who experienced symptoms of shortness of breath with the application of pursed lips breathing, it is concluded as follows:

The results of the assessment on Mr. M that the patient with a diagnosis of COPD. Patients with complaints of shortness of breath have felt the last 3 months. Shortness of breath is felt occasionally and worsens when doing activities, lying down and when coughing. Coughing without phlegm has been felt for the last 7 months, chest pain has occurred in the last 3 months, nausea, heartburn, hoarseness for the last 3 months. The patient also complained of weakness, decreased appetite. Previous medical history, the patient had hypertension for a long time and took hypertension medication but not regularly. History of COPD in February 2024. The patient has a habit of smoking since 30 years ago, spending 4 packs a day and drinking coffee and alcohol regularly. Based on the case, the nursing diagnoses for Mr. M are Ineffective Breathing Patterns b / d with Obstacles to Breathing Efforts, Activity Intolerance b / d Imbalance between oxygen supply and demand, Risk of Nutritional Deficits d / d the patient said he had no appetite. The implementation of interventions for Mr. M is in accordance with the nursing diagnosis and applies interventions based on EBN, namely pursed lips breathing.

The implementation given is an implementation based on each diagnosis that has been compiled, as well as implementation based on EBN, namely pursed lips breathing, gradually arranging the patient's position sitting upright in a bed or chair, instructing the patient to relax on the shoulders and neck, with the mouth closed, inhale slowly through the nose for 2 seconds, exhale slowly for 4 seconds. Evaluation of application based on nursing problems in Mr.M that one problem raised is resolved, while Mr.M of the 3 nursing problems raised there are two partially resolved problems namely Activity Intolerance and Risk of Nutritional Deficits, while for one other problem namely Ineffective Breathing Patterns can be resolved.

REFERENCE

Aceh, A. R., Parinduri, J. S., Munir, C., & Matondang, E. R. S. (2023). The effect of pursed lips breathing on the breathing pattern of COPD patients at Mitra Medika Tanjung Mulia House. *Al-Asalmiya Nursing: Journal of Nursing Sciences, 12*(2), 190-194. https://doi.org/10.35328/keperawatan.v12i2.2503

Adiana, I. N., & Maha Putra, I. N. A. (2023). Relationship between education level and comorbidity with self-care behavior of chronic obstructive pulmonary disease (COPD) patients. *National Journal of Health Research, 7*(1), 72-77. https://doi.org/10.37294/jrkn.v7i1.486

Agreta, S. M. N., Rayasari, F., & Kamil, A. R. (2023). Application of pursed-lips breathing intervention increases peak expiratory flow in chronic obstructive pulmonary disease patients.

Amalia, F. N. N., & Wiriansya, E. P. (2022). Oxygen therapy at home. *Wal'afiat Hospital Journal, 3*(2), 173-186. https://whj.umi.ac.id/index.php/whj/article/view/whj2201

Ardenny, & Agus, F. (2022). The effect of semi-Fowler sleeping position on sleep quality in patients with COPD in the pulmonary disease inpatient room of RSUD Selasih Pelalawan District. *JONAH*.

Astriani, N. M. D. Y., Sandy, P. W. S. J., Putra, M. M., & Heri, M. (2021). Administration of semi-Fowler position improves oxygen saturation of COPD patients. *Journal of Telenursing (JOTING, 3*(1), 128-135.

Damansyah, H., Monoarfa, S., & Eyato, A. A. (2023). Application of tripod position and pursed-lip breathing techniques to the increase in oxygen saturation in shortness of breath patients in the emergency room at Prof. Dr. Aloe Saboe Hospital. *Journal of Anesthesia: Journal of Health and Medical Sciences, 1*(3), 129-139. https://doi.org/10.59680/anestesi.v1i3.344

Dewi, R., Siregar, S., Manurung, R., & Bolon, C. M. T. (2022). Community development of disease and training of footwalkers with chronic obstructive lung disease (COPD) in Kolam Kecam Village of Percut Sei Tuan Ratna. *1*(2), 30-35.

Fattah, N., Zulfahmidah, Wiriansya, E. P., Syamsu, R. F., Arfah, A. I., & Alifian, A. F. (2022). Effect of body mass index (BMI) on forced vital capacity (FVC) in COPD patients at Ibnu Sina Hospital Makassar. *UMI Medical Journal, 7*(2), 85-96.

Haerul, & Mansur, M. A. (2021). The effect of breathing exercise pursed-lips breathing method on the quality of life of stable COPD patients at Labuang Baji Hospital Makassar. *Muhammadiyah Nursing Journal, 6*(4).

Hakim, A. N., Adharudin, M., Ardi, N. B., Firman, M., Program, Y., Nursing, S., High, S., Health, I., Dharma, W., Tangerang, H., & South, T. (2022). Overview of management of pursed lips breathing respiratory techniques in chronic obstructive lung disease (COPD): A systematic review. *Nursing Analysis: Journal of Nursing Research, 2*(2), 135-143.

Handayani Siburian, C., Damanik, H., Dewi, R., & Herlina, M. (2022). Relationship between sleep quality and fatigue in chronic obstructive pulmonary disease (COPD) patients. *Healthy People: Journal of Public Health, 1*(4), 464-472.

Husnah. (2020). The relationship between the degree of chronic obstructive pulmonary disease and malnutrition in chronic obstructive pulmonary disease patients at Meuraxa General Hospital poly. *Syiah Kuala Medical Journal, 20*(1), 27-30. https://doi.org/10.24815/jks.v20i1.18295

Islami, V. E. A., & Suyanto. (2020). Differences in oxygen saturation values of COPD patients using pursed lip breathing and 6-minute walk exercise. *Bahana of Journal Public Health, 4*(1), 17-22. https://doi.org/10.35910/jbkm.v4i1.250

Karniati, R., & Kristinawati, B. (2023). Implementation of pursed lips breathing to reduce respiratory rate in patients with chronic obstructive pulmonary disease (COPD). *Journal of Nursing, 15*, 2085-1049.

Khairunnisa, Fauzan, S., & Sukarni. (2020). The effect of pursed lips breathing exercise on the intensity of shortness of breath in patients with chronic obstructive pulmonary disease (COPD), 1-10.

Kurniyanti, N., Rahmawati, Kidingallo, Y., Wiriansya, E. P., & Selma, R. (2023). Characteristics of chronic obstructive pulmonary disease patients at Ibnu Sina Hospital Makassar. *Fakumi Medical Journal: Journal of Medical Students, 3*(5), 350-356. https://doi.org/10.33096/fmj.v3i5.230

Lin, J. S., Elisabeth, M., Webber, & Thomas, R. G. (2022). Screening for chronic obstructive pulmonary disease: A targeted evidence update for the U.S. Preventive Services Task Force.

Meilinda, B. D., Priono, R. I. P., Rahadianti, D., & Winangun. (2022). The relationship between body mass index and forced expiratory volume in second 1 (FEV1)/forced vital capacity (FVC) in stable COPD patients at the Regional General Hospital of NTB Province in 2019. *Deliberation National Association of Indonesian Private Medical Faculties*, 303-313.

Muhammad, I., & Aini, D. N. (2021). Application of pursed lips breathing exercise to respiratory rate in COPD patients with dyspnea. *Widya Husada Ners Journal, 3*(8), 32.

Muttaqin, A. (2019). *Textbook of nursing care for clients with respiratory system disorders.*

Ndary, D. W., Margono, M., & Hidayah, N. (2023). The effect of pursed lips breathing technique on oxygen saturation in chronic obstructive lung disease (COPD) patients in the Tulip Room of Temanggung Hospital. *Proceedings of University Research Colloquium*, 194-203.

Nursiswati, N., Nurrofikoh, M., Winastuti, D., Rahmawati, L., & Kurniawan, T. (2023). Education on pursed lip breathing and effective coughing techniques for families of COPD patients. *Journal of Creativity of Community Service (PKM)*, *6*(8), 3084-3098. https://doi.org/10.33024/jkpm.v6i8.10138

Pangandaheng, T., Suryani, L., Syamsiah, N., Kombong, R., Sari, A., Fitri, R., Etrikanawati, T., Nurjanah, U., Eldawati, S., Sasimito, P., Suryanto, Y., & Priambodo, A. (2023). *Medical-surgical nursing care (respiratory and cardiovascular systems* (P. Intan Daryaswanti, Ed.).

Pujiati, L., & Suherni. (2023). The effect of PLB on the breathing patterns of COPD patients at Sundari Hospital: The respiratory frequency or respiratory rate (RR) in COPD increases the ventilation of COPD patients. *Journal of Midwifery, Nursing and Health, 3*(2), 26-30. https://doi.org/10.51849/j-bikes.v

Radhiyatulqalbi, F. F. (2021). *Serum calcium concentration with lung function of people with chronic obstructive lung disease (COPD)* (H. Shofa, Ed.).

Ramadhani, S., Purwono, J., & Utami, I. T. (2022). Application of pursed lip breathing to reduce shortness of breath in chronic obstructive pulmonary disease (COPD) patients in the pulmonary room of Jend. Ahmad Yani Metro City Hospital. *Young Cendikia Journal*, *2*(2).

Ramli, Ismansyah, & Andrianur, F. (2023). Effect of clapping technique and deep breath relaxation on oxygen saturation in COPD patients in the ED of dr. H. Soemarno Sosroatmodjo Tanjung Selor Hospital. *Aspiration of Health Journal*, *1*(2), 212-220. https://doi.org/10.55681/aohj.v1i2.101

Roselyn, N. A., Adhiputri, A., Munawaroh, S., & Aphridasari, J. (2023). The relationship of the degree of shortness of breath and airway obstruction with the quality of life of COPD patients. *Journal of Medicine University Palangka Raya*, *11*(2), 63–71. https://doi.org/10.37304/jkupr.v11i2.9850

Rosyadi, I., Djafri, D., & Rahman, D. (2019). Effect of pursed lip-breathing, diaphragmatic breathing, and upper limb stretching on dyspnea scale in COPD patients. *NERS Journal of Nursing*, *15*(2), 103.

Sahrudi, & Ameilia, N. A. (2024). The effect of oxygen administration using nasal cannula on oxygen saturation in patients with COPD in IGD RS TK II Moh Ridwan Meuraksa. *Malahayati Nursing Journal*, *6*(1), 141-151. https://doi.org/10.33024/mnj.v6i1.10549

Silalahi, K., & Siregar, T. H. (2019). The effect of pursed lips breathing exercise on reducing shortness of breath in patients with chronic obstructive pulmonary disease (COPD) at RSU Royal Prima Medan 2018. *Priority Nursing Journal, 2*(1), 93-103.

Sitorus, J. (2021). Effect of pursed lips breathing and positioning on oxygen saturation of patients with COPD at HKBP Balige Hospital. *HKBP Balige Nursing Journal*, *2*(1), 15-25. http://ejournal.patria-artha.ac.id/index.php/jns

Situmorang, S. H., Ramadhani, Y., Situmorang, H., Wahyuni, N., Haryanti, T., & Purba, V. M. (2023). The effect of pursed lips breathing on the breathing pattern of COPD patients at Sansani Hospital Pekanbaru. *JONS: Journal of Nursing, 1*(1), 20-25.

Sulistyanto, B. A., Rahmawati, D. I., Irnawati, I., & Kartikasari, D. (2023). Effect of pursed-lip breathing (PLB) exercise on respiratory status in patients with chronic obstructive pulmonary disease (COPD).

Supardi, E., Handayani, D. E., Sariama, & Astuti. (2023). Application of pursed lip breathing in fulfilling oxygen needs (ineffective breathing patterns) in COPD patients. *JAWARA (Scientific Journal of Nursing), 4*(3), 1-9.

Widiasari, L., & Nurlaily, A. P. (2023). Nursing care for patients with COPD: Breathing pattern not effective with intervention pursed lips breathing. *Kusuma Husada University Surakarta, 31*(2).