JURNAL PENELITIAN SEKOLAH TINGGI ILMU KESEHATAN NAHDLATUL ULAMA TUBAN
https://ejournal.iiknutuban.ac.id/index.php/jp
E-ISSN: 2686-4959
P-ISSN: 2338-5898
VOL. 7 NO.1 June. Page 33-40

Nursing Care with Effective Cough Training for Asthma Patients with Ineffective Airway Clearance at RSUD Dr. Wahidin Sudiro Husodo, Mojokerto: A Case Study

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Article Info:
Submitted: March 3rd, 2025
Accepted: June 5th, 2025
Published: June 13rd, 2025

Handling Editor:
June 13rd, 2025

Keywords:
Asthma; Airway Clearance; Ineffective Effective cough training.

ABSTRACT

Background: Asthma is a chronic respiratory disease characterized by inflammation of the airways, causing difficulty breathing and symptoms such as shortness of breath, coughing, and wheezing. One of the primary problems for asthma sufferers is ineffective airway clearance, often caused by the accumulation of mucus. This condition can worsen asthma symptoms and increase the risk of attacks. The method employed is descriptive, utilizing a case study approach to nursing care involving two respondents. Data collection techniques included interviews, observation, and documentation of activities carried out, including assessment, nursing diagnosis, nursing intervention, implementation, and evaluation. The results of this study discuss the absence of a gap between theory and the implementation of nursing care for clients 1 and 2 with effective cough exercises. This was shown from the results of interviews and observations of two clients with ineffective airway clearance problems based on the results of the assessment. Based on the implementation of nursing care, which had been carried out for 3 days, it was found that the problem had been resolved well. So the suggestion for future researchers is to increase research time so that they get maximum results.

1. INTRODUCTION

Asthma is caused by narrowing of the airways that carry air to the lungs. Ineffective airway clearance is the inability to clear secretions or airway obstructions to maintain a patent airway. This narrowing is recurrent but reversible. Ineffective airway clearance, if ignored, will result in inadequate oxygen supply to the brain, causing cyanosis and death. Signs of ineffective airway clearance itself are ineffective coughing, wheezing, or rhonchi, and shortness of breath. Asthma is a lung condition that causes difficulty breathing. (WHO 2022).

The prevalence of asthma, according to the World Health Organization (WHO) in 2020, was around 235 million patients. Asthma is a health problem worldwide, affecting approximately 1-18% of the population in various countries in the world. Based on data from the Ministry of Health in 2020, Asthma is one of the most common types of diseases suffered by the Indonesian people. Until the end of 2020, the number of

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asthma sufferers in Indonesia was 4.5 percent of the total population of Indonesia, or more than 12 million. The incidence of Asthma in Indonesia is 2.4%, and in East Java, it is 2.6% (Siswidiasari et al. 2023).

Asthma cases at Dr. Wahidin Sudiro Husodo, Mojokerto Regional Hospital in 2024 It was recorded that the number of Asthma sufferers hospitalized was 25 people, and outpatients were 35 people, where Asthma sufferers from January-May were 6%.

Asthma occurs due to excessive external allergic stimuli, so that the respiratory tract narrows, which results in ineffective airway clearance. If this is allowed to continue for a long time, it will have an impact on low oxygen levels. In addition, there are various factors that influence asthma, including age, gender, race, socio-economic and environmental factors. These factors can influence the occurrence of asthma attacks, the degree of asthma, and also death from asthma. (Laksana, M.A. & Berawi 2015).

Asthma is a disease of the airways that causes symptoms to sometimes become much worse. This is known as an asthma attack. Common symptoms of asthma include: persistent cough, especially at night, wheezing when exhaling and sometimes when inhaling, shortness of breath or difficulty breathing, sometimes even at rest, tightness in the chest, making it difficult to breathe deeply. Some people will experience worse symptoms when they have a cold or when the weather changes. Other triggers can include dust, smoke, fumes, grass and tree pollen, animal hair and dander, strong soaps and perfumes. The main problem that asthma sufferers often complain of is shortness of breath (Partono, 2019).

Most asthma patients experience ineffective airway clearance problems. Accompanied by signs and symptoms such as ineffective cough, inability to cough, excessive sputum, wheezing, wheezing / dry rhonchi, and accompanied by restlessness, cyanosis, decreased breath sounds, changes in breathing frequency, changes in breathing patterns. (TIM POKJA SDKI DPP PPNI 2020).

Ineffective airway clearance is caused by the accumulation of secretions or airway obstruction. If not treated immediately, the patient will experience shortness of breath and a lack of oxygen in the body, which can lead to death. Extrinsic trigger factors: Infection (viruses, bacteria, fungi), physical activity, food (fish, milk, eggs, allergens (cigarette smoke, dust), weather/cold air. Intrinsic trigger factors are emotional (anxiety, tension, fear) and hereditary food, so that antigens bound to IgE on the surface of Mast cells or basophils, release mediators: histamine, platelets, bradykinin, etc. Increased permeability, mucosal edema, productive secretion, increased smooth muscle constriction, smooth muscle spasm, increased bronchial gland secretion, narrowing/proximal obstruction of the bronchi at the expiration and inspiration stages of sputum, excess mucus, coughing, wheezing, shortness of breath, so that airway clearance is ineffective.

There are two ways to manage asthma, pharmacological and non-pharmacological. Pharmacological management, such as administering drugs, namely bronchodilators used to relieve symptoms due to narrowing of the respiratory tract, cromolyn, which works by inhibiting mast cell degranulation in releasing histamine as a mediator of allergic diseases, ketolifen, which functions to relieve allergy symptoms, and corticosteroid hydrocortisone, which functions to relieve inflammation. While non-pharmacological management is for ineffective airway clearance with effective coughing exercise techniques can help free and relieve the airways. Effective coughing

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techniques aim to overcome dyspnea and help remove secretions in the airways. (Sulistini, R., Aguiscik,& Ulifa, 2021)

Combination with effective coughing exercises in patients with airway clearance disorders can help expel secretions. Health workers or nurses can teach effective coughing exercises to patients, adjust the position, namely the semi-Fowler position, and apply a combination of warm water vapor therapy. (Direktorat Jenderal Pelayanan Kesehatan 2022)

Based on the background above, the research problem can be formulated as follows: How is nursing care for asthma clients with ineffective airway clearance at Dr. Wahidin Sudiro Husodo Hospital, Mojokerto City?

The purpose of this study was to implement nursing care for asthma clients with ineffective airway clearance at Dr. Wahidin Sudiro Husodo Regional Hospital, Mojokerto City.

2. METHODE

This study is a type of case study research. This case study research is a study that explores a problem of Nursing Care for 2 Asthma Clients by have the airway ineffectively, has in-depth data collection, and contains various sources of information. Researchers study cases limited by time and place, and the cases studied are in the form of events, activities, or individuals. Research data were taken using the time series method, namely, research conducted for 3 consecutive days on each asthma patient. Patient 1 on March 4 - March 6, 2025, and patient 2 on March 10 - March 12, 2025

3. RESULTS AND DISCUSSION

Researchers during nursing care on 2 patients with asthma in the Kerta Wijaya and Jatinegara internal medicine rooms of Dr. Wahidin Sudiro Husodo Mojokerto Hospital, with effective cough training, implementation time for 3 days for each patient. This discussion covers all stages of nursing care, including assessment, nursing diagnosis, nursing intervention, nursing implementation, and evaluation, which are described as follows:

Assessment

In client An. N during the assessment, data was obtained that the patient complained of shortness of breath, coughing, and difficulty in expelling phlegm. The client said that shortness of breath accompanied by coughing occurred 5 days ago, and they felt weak and powerless. Based on the examination carried out by the nurse on client An. N, objective data was obtained, namely the patient's consciousness was comatose, pulse: 88x / minute, temperature: 36^0c, RR: 33x / minute, SpO: 99%, additional wheezing breath sounds were heard. At the assessment stage with client An. L, subjective data was found that the client said that he had shortness of breath and coughing, the client said that he came accompanied by his family because he had shortness of breath for 1 month, came and went, had a dust allergy, and decreased appetite for the past 3 days. Currently accompanied by a cough with phlegm. Based on the examination carried out by the nurse, objective data were obtained from client An. L, namely the patient's consciousness was compos mentis, pulse: 117x/minute, temperature: 36.8^0c, RR: 35 x/minute, SpO: 90%, additional wheezing breath sounds were heard.

Based on research penelitian (Yuna Septia et al. 2024), the results showed that Effective Cough is useful in expelling phlegm in Asthma patients with Ineffective Airway Clearance. Researcher (Sulistini, R., Aguiscik,& Ulifa, 2021) reported that to overcome shortness of breath and remove

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secretions, the most effective method is the application of effective coughing. According to (Sulistini, R., Aguiscik,& Ulifa, 2021), In Asthma patients with a diagnosis of ineffective airway clearance, this is influenced by the accumulation of excessive secretions that cannot be expelled spontaneously, usually the client experiences shortness of breath, coughing, wheezing breath sounds and increased breathing frequency. The facts found by researchers in clients An. N and An. L are that both clients experience shortness of breath accompanied by coughing, in this case by research conducted according to the journal (Sulistini, R., Aguiscik,& Ulifa 2021) that clients with a diagnosis of ineffective airway clearance usually experience shortness of breath and coughing, so that the assessment carried out by the researcher is by the research.

Diagnosis

Based on the results of the assessment above, the researcher formulated a nursing diagnosis for An. N and An. L, namely in An. N ineffective airway clearance related to foreign objects in the airway, d.d. difficulty expelling sputum. The client said shortness of breath, coughing, and difficulty expelling phlegm, in An. L ineffective airway clearance related to foreign objects in the breath, d.d., excessive sputum. The client said shortness of breath and coughing. The reason the researcher raised the diagnosis of ineffective airway clearance is that it is supported by data, such as theoretical concepts.

From inside the book buku (TIM POKJA SDKI DPP PPNI 2017) There are four nursing diagnoses in asthma patients, namely: 1) Ineffective Airway Clearance; 2) Ineffective Breathing Pattern; 3) Impaired Gas Exchange; 4) Activity Intolerance. In real cases experienced by patients with Asthma, three nursing diagnoses were found, one of which is ineffective airway clearance related to airway hypersecretion characterized by ineffective cough, excessive sputum, wheezing, dyspnea, and changes in breathing frequency, which are the main diagnoses in the case experienced by the patient. Namely, the patient experiences shortness of breath, coughing up phlegm, difficulty expelling phlegm, and the presence of additional breath sounds. Ineffective airway clearance is the inability to clear secretions or airway obstruction to maintain a patent airway. The signs and symptoms that arise include ineffective coughing, excessive sputum, wheezing or wheezing breath sounds, and ronchi (SDKI DPP PPNI 2017 POKJA TEAM). The nursing diagnosis raised by the researcher in client An. N and An. L is ineffective airway clearance according to theory. *(TIM POKJA SDKI DPP PPNI 2017)*

Intervention

The researcher conducted interventions (nursing plans) on clients. N and An. L as follows: Identify coughing ability, monitor sputum retention, monitor signs and symptoms of respiratory tract infection, monitor fluid input and output (eg, amount and characteristics), adjust the semi-Fowler or Fowler position, put a sheet and a sling on the patient's lap, remove secretions in the sputum container, explain the purpose and procedure for effective coughing, encourage deep breaths through the nose for 4 seconds, hold for 2 seconds, then exhale through the mouth with pursed lips (rounded) for 8 seconds, encourage repeating deep breaths up to 3 times, encourage coughing strongly immediately after the 3rd deep breath and collaborate on giving mucolytics or expectorants.

From inside the book buku (TIM POKJA SDKI DPP PPNI 2017)ineffective airway clearance intervention is to adjust the semi-Fowler and Fowler positions, put a

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sheet and a bend on the patient's lap, and remove secretions in the sputum container. Educational actions, namely explaining the purpose and procedure for effective coughing, encouraging deep breathing through the nose for 4 seconds, holding it for 2 seconds then releasing it through the mouth with pursed lips for 8 seconds, encouraging deep breathing for up to 3 seconds, encouraging coughing strongly immediately after the 3rd deep breath.

Interventions in the diagnosis of ineffective airway clearance between facts and theory did not find any gaps because they had been adjusted to the needs and conditions of the client. Handling of clients. N and An. L with ineffective airway clearance, namely: effective coughing exercises, from the interventions carried out by researchers, by the theory in the book (TIM POKJA SDKI DPP PPNI 2017).

Implementation

The implementation of effective cough training in nursing was carried out on An. N and An. L is as follows: identifying coughing ability, monitoring sputum retention, monitoring signs and symptoms of respiratory tract infection, monitoring fluid input and output (eg amount and characteristics), adjusting the semi-Fowler or Fowler position, placing a sheet and bandage on the patient's lap, removing secretions in the sputum container, explaining the purpose and procedure of effective coughing, encouraging deep breaths through the nose for 4 seconds, holding for 2 seconds then releasing through the mouth with pursed lips (rounded) for 8 seconds, encouraging repeating deep breaths up to 3 times, encouraging coughing strongly immediately after the 3rd deep breath and collaboration in administering mucolytics or expectorants. In carrying out nursing actions, all are carried out based on nursing theory that focuses on established interventions.

Effective coughing exercises are training clients who do not have the ability to cough effectively to clear the larynx, trachea, and bronchioles of secretions or foreign objects in the airways. nafas (TIM POKJA SDKI DPP PPNI 2017)

Implementation of effective coughing exercises carried out on patients consists of: identifying coughing ability, monitoring sputum retention, monitoring signs and symptoms of respiratory tract infection, monitoring fluid input and output (eg, amount and characteristics), adjusting the semi-Fowler or Fowler position, placing a pad and a sling on the patient's lap, removing secretions in the sputum container, explaining the purpose and procedure of effective coughing, encouraging deep breaths through the nose for 4 seconds, holding for 2 seconds then releasing through the mouth with pursed lips (rounded) for 8 seconds, encouraging repeating deep breaths up to 3 times, encouraging coughing strongly immediately after the 3rd deep breath and collaboration in administering mucolytics or expectorants, if necessary.

In carrying out nursing actions, all are carried out based on nursing theory that focuses on established interventions.

Evaluation

Based on the nursing actions that have been carried out on An. N and An. L, the researcher evaluated each action and obtained the following data: on the first day, patient An. N complained of shortness of breath, coughing and difficulty in expelling phlegm, wheezing breath sounds were heard, pulse: 88x/minute, temperature: 36^{0}c, RR: 30 x/minute, SpO: 99%. On the first day, patient Ny. L said shortness of breath and coughing, wheezing breath sounds were

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heard, pulse: 110x/minute, temperature: 36.8⁰c, RR: 32 x/minute, SpO: 90%.

After effective coughing exercises were carried out for 3 days on both patients which aimed to reduce shortness of breath by widening the airways and thinning phlegm. The results obtained in patient An. N said that he was no longer short of breath and phlegm could be removed, pulse: 82x / minute, temperature: 36.4⁰c, RR: 28x / minute, SpO: 99%. Inpatient An.L said that shortness of breath had decreased and phlegm could be removed little by little, wheezing and ronchi breath sounds were heard, pulse: 82x / minute, temperature: 36.2⁰c, RR: 27x / minute, SpO: 100%. From the nursing care that has been carried out, this is in line with the intervention that has been made, where the objectives and criteria for the results to be achieved are increased effective cough, decreased sputum production, decreased wheezing, and improved breathing frequency. (TIM POKJA SDKI DPP PPNI 2017) According to also said that in asthma patients who were given effective coughing exercises, there were changes, namely reduced shortness of breath and improved breathing frequency.

So it was found that the results of the evaluation of ineffective airway clearance nursing problems based on the data of the two clients above were obtained in Mr. L and An. L, the problem was resolved, in the implementation of nursing actions, no obstacles were found because the client and family were cooperative with the nurse. Both clients were able to perform the correct, effective coughing technique independently.

4. CONCLUSION

The results of the study that has been conducted on the application of effective coughing in improving airway clearance in asthma patients it can be concluded that the procedure of effective coughing exercises in asthma cases can improve airway clearance. This is evidenced by an increase in the amount of daily sputum output, which indicates an increase in the patient's airway cleanliness, also evidenced by increased effective coughing exercises, decreased sputum production, decreased wheezing breath sounds, and improved respiratory frequency.

5. ACKNOWLEDGMENTS

As the author, I would like to express my deepest gratitude to all parties who have supported the preparation of this journal.

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