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The Application of Warm Steam Therapy Using Eucalyptus Oil Aromatherapy in Treating Respiratory Tract Infection in Children with Bronchopneumonia

Devi Nurul Qur'aeni[1], Dwiyanti Purbasari[1], Nonok Karlina[1]

[1] *Program Studi Profesi Ners, Institut Teknologi Dan Kesehatan Mahardika, Cirebon, Indonesia*

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Corresponding Author :
Devi Nurul Qur'aeni
E-mail :
deviquraeni@gmail.com

ABSTRACT

Background & Objective: Bronchopneumonia is an inflammation of the lung parenchyma caused by bacteria, viruses, fungi, or foreign objects. Simple inhalation therapy involves administering medication in the form of vapor into the respiratory tract using simple materials and methods. **Method:** This study is a case study with a qualitative descriptive approach, conducted in the Wijaya Kusuma Atas ward of Kardinah Tegal General Hospital. Data were obtained through nursing care assessment and documentation of patients with bronchopneumonia who were hospitalized and experienced airway clearance disorders. The intervention involved administering warm steam therapy using eucalyptus essential oil aromatherapy for 10–15 minutes over three days. **Result:** The case study results showed an improvement in airway clearance effectiveness in patients receiving eucalyptus essential oil steam therapy. **Conclusion:** Warm steam therapy using eucalyptus essential oil aromatherapy is effective as an additional intervention to address airway clearance issues in patients with bronchopneumonia.

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Introduction

Bronchopneumonia is a medical term used to describe inflammation that occurs in the walls of the bronchioles and the surrounding lung tissue. Bronchopneumonia is sometimes referred to as lobular pneumonia because the inflammation originates from localized lung parenchyma involving the bronchioles and adjacent alveoli (Muhlisin, 2017). In 2015, the incidence of bronchopneumonia in developing countries,

including Indonesia, was nearly 30%, whereas in 2019, the incidence decreased to 20%. This condition occurs in children under five years of age and carries a high risk of mortality (Ministry of Health of the Republic of Indonesia, 2019).

Inflammation of the lung parenchyma causes bronchopneumonia, also known as lobular pneumonia, which can be caused by various types of bacteria, viruses, fungi, and foreign bodies localized in the bronchioles and surrounding alveoli. This disease process leads to clinical manifestations, one of which is ineffective airway clearance (Nofitri, 2019).

Bronchopneumonia in children is a type of pneumonia that should be considered serious because it can lead to complications and even death. The symptoms are similar to those of the common flu, including fever, cough, and shortness of breath. Children are vulnerable to various illnesses, one of which is bronchopneumonia. In children, bronchopneumonia often presents with symptoms similar to other respiratory illnesses, such as cough, runny nose, fever, and shortness of breath. However, in bronchopneumonia, these symptoms can become more severe and localized to specific areas of the lungs. Patients may experience mucus vomiting, difficulty breathing, and adventitious breath sounds due to ineffective airway clearance. More serious problems may occur if the airway is not properly maintained, such as severe breathing difficulty and the possibility of death (R. M. Sari & Lintang, 2022).

According to a World Health Organization (WHO) report, around 800,000 to 2 million children die each year due to bronchopneumonia. The United Nations Children's Fund (UNICEF) and WHO have identified bronchopneumonia as the leading cause of death among children under five years old, surpassing other diseases such as measles, malaria, and Acquired Immunodeficiency Syndrome (AIDS). In 2017, bronchopneumonia claimed the lives of at least 808,694 children under the age of five (WHO, 2019).

Health services for infants, toddlers, and preschool children aim to reduce child and infant mortality rates. Improving children's health quality through healthcare services can prevent diseases that can be fatal to infants and young children. Prompt and appropriate handling can be carried out by identifying various symptoms that may arise when airway clearance problems occur (Haile G, 2023).

According to WHO reports, around 800,000 to 2 million children die each year due to bronchopneumonia. UNICEF and WHO also state that bronchopneumonia is the leading cause of death in children under five years old, surpassing measles, malaria, and AIDS. In 2017, it killed at least 808,694 children under the age of five (WHO, 2019).

In 2021, bronchopneumonia became the third most common cause of death in Indonesia, after cardiovascular disease and tuberculosis. The incidence of bronchopneumonia in young children increased from 94.12% to 97.30%. Data on the number of children under five suffering from bronchopneumonia by gender in 2022 in Central Java Province, particularly in the Semarang region, showed that there were

863 male cases (24.04%) out of 35,899 male children, with 3,590 total patients (Nuzulia, 2022).

The inflammatory process in bronchopneumonia leads to clinical manifestations that give rise to several problems, one of which is ineffective airway clearance. Ineffective airway clearance is the inability to clear secretions or obstructions from the airway to maintain a patent airway. If this issue is not addressed promptly, it can lead to more severe problems, such as severe respiratory distress and even death (Padila, 2015).

Inhaling warm steam combined with warming aromatherapy (e.g., eucalyptus oil or telon oil) is one simple treatment. Steam inhalation therapy is easy to perform at home and can help relieve the airways by thinning secretions, making them easier to expel. It has been reported that inhaling aromatherapy steam from telon oil or eucalyptus oil can help reduce colds and nasal congestion (Hasanah et al., 2024).

A study conducted by Monicha Sari & Lintang (2022), titled Nursing Care for a Child with Ineffective Airway Clearance in Bronchopneumonia through the Application of Combined Hot Water Steam Therapy and Eucalyptus Oil in the Wijaya Kusuma Ward at RSUD Kardinah, Tegal City, reported that after simple steam inhalation therapy using eucalyptus oil, respiratory rate decreased, cough frequency decreased, and the ability to cough effectively improved. This is supported by a study by Oktiawati & Nisa (2021) titled Steam Therapy with Eucalyptus Oil Reduces Respiratory Rate in Children with Bronchopneumonia, which stated that it was effective in reducing respiratory rate, alleviating shortness of breath, improving the ability to expel secretions, and decreasing adventitious breath sounds such as rhonchi.

Based on the above description, the researcher is interested in preparing a final report entitled: "Application of Warm Steam Therapy Using Eucalyptus Oil Aromatherapy in Managing Airway Clearance in Patients with Bronchopneumonia."

Objective

Based on this, the researcher was interested in conducting this study with the aim of determining the application of warm steam therapy using eucalyptus oil aromatherapy in clearing the airways of patients with bronchopneumonia.

Method

The method used in this study is a case study design. The case study was conducted by collecting data according to the nursing process flow, namely assessment, determining nursing diagnoses, developing intervention plans, implementing nursing actions, and evaluation. The population in this case study was pediatric bronchopneumonia patients who were hospitalized in the Wijaya Kusuma Atas ward. This study was conducted in December 2024 over three days in the Wijaya Kusuma Atas ward of Kardinah Tegal Regional General Hospital. Data collection was carried out through three methods: interviews, observations, and documentation. Data analysis was conducted descriptively from the beginning of the assessment

process, with documentation conducted daily over three days to monitor the patient's progress.

Results

The client, a 4-year-7-month-old female diagnosed with bronchopneumonia, presented with ineffective airway clearance related to airway hypersecretion. Physical examination revealed pale appearance, restlessness, compos mentis but weak condition, body temperature of 38.5°C, respiratory rate of 25 breaths/minute, pulse rate of 90 beats/minute, and oxygen saturation of 97%. Chest auscultation detected coarse and fine wet crackles in the lower right hemithorax.

The main nursing intervention implemented was airway management, which included monitoring respiratory patterns, adventitious breath sounds, and sputum characteristics; positioning in semi-Fowler's; providing warm fluids; oxygen administration as needed; educating on effective coughing techniques; and collaborating for bronchodilator, expectorant, or mucolytic administration when necessary. The supportive intervention applied was warm steam inhalation with eucalyptus oil, performed 1–2 times daily for 10–15 minutes.

After 3 × 24 hours of implementation, the client demonstrated improvement, including decreased cough frequency, reduced adventitious breath sounds, improved ability to expectorate sputum, and overall better airway clearance.

Discussion

The application of warm steam therapy using eucalyptus essential oil aromatherapy was conducted by the researcher for three consecutive days, each session lasting 10–15 minutes, with repetition for each subject. The results showed that clients and their families were cooperative in performing warm steam therapy using eucalyptus essential oil aromatherapy daily. The clients and their families understood the technique and method of administering warm steam therapy using eucalyptus essential oil aromatherapy to reduce secretions in the respiratory tract. There was a decrease, and the client's mother reported that her child's coughing with phlegm and coughing frequency had significantly decreased. The client's mother stated that her child always consumed warm milk and took medication on time, and the child appeared to be sitting in a semi-Fowler position, with a respiratory rate of 20 breaths per minute and SPO2 at 99%, and crackles were heard in the lungs. The client was able to inhale warm steam and had become less frequent in coughing, with secretions gradually decreasing.

In line with the study by Anisa Oktiawati and Ariani Fitriana Nisa (2021) titled "Eucalyptus Oil Steam Therapy Reduces Respiratory Rate in Children with Bronchopneumonia," which used a case study approach on two toddlers with bronchopneumonia exhibiting symptoms of shortness of breath and impaired airway clearance. The intervention involved administering warm steam therapy mixed with two drops of eucalyptus oil for 10 minutes, four times a day over three days. The

results showed a decrease in respiratory rate and an improvement in the children's ability to expel secretions, as well as a reduction in symptoms such as rales and chest wall retractions. The similarity between that study and this study is in the same intervention method, namely the use of warm steam therapy with the addition of eucalyptus oil to address respiratory disorders in children with bronchopneumonia.

Conclusion

Based on the results of the case study of An.A with bronchopneumonia in the administration of warm steam therapy using eucalyptus oil aromatherapy in the Wijaya Kusuma ward of Kardinah Tega Regional General Hospital, the author can draw the following conclusions: the evaluation conducted over three days on the initial diagnosis of ineffective airway clearance, where nursing intervention involved administering warm steam with eucalyptus oil, resulted in the client's mother reporting that coughing and rales had decreased.

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