APPLICATION OF EUCALYPTUS OIL AROMATHERAPY TO TREAT BREATHING DISORDERS IN TODDLERS WITH BRONCHOPNEUMONIA

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ABSTRACT

Ronchopneumonia is a lower respiratory tract infection that often causes breathing disorders in toddlers. This study aims to describe the application of eucalyptus oil aromatherapy in improving breathing patterns in toddlers with bronchopneumonia at Sidikalang Regional Hospital in 2025. The research design used was a descriptive case study with two children aged 4 and 5 years who met the inclusion criteria. The intervention was carried out for seven consecutive days by administering eucalyptus oil aromatherapy through indirect inhalation and application to the chest and back for 15–20 minutes, twice a day. Data were collected through observation and structured interviews and then analyzed descriptively. The results of the study showed an improvement in breathing patterns in both subjects, namely for the first sub (1) a decrease in breathing frequency from 48 to 30 times per minute Regular breathing, regular breathing rhythm, the use of accessory muscles is not visible and the sound of fine rhonchi breath, the subject appears more relaxed while in the second subject (2) a decrease in breathing frequency from 42 to 29 times per minute Regular breathing, regular breathing rhythm, the use of accessory muscles is not visible and the sound of fine rhonchi breath, the subject appears more relaxed. These findings indicate that eucalyptus oil aromatherapy can be used as a non-pharmacological complementary intervention to help reduce breathing pattern disorders in toddlers with bronchopneumonia. Further research with a larger sample size is needed to strengthen the results and their application in pediatric nursing practice.

Keywords : *bronchopneumonia; cajuput oil; aromatherapy; breathing pattern; pediatric nursing.*

INTRODUCTION

Bronchopneumonia is one of the most common lower respiratory tract infections experienced by children under five years of age (toddlers) and is the leading cause of respiratory disorders. According to a report by the World Health Organization (WHO, 2022), pneumonia, including bronchopneumonia, is still the cause of approximately 14% of deaths in children under five years of age worldwide, with an estimated 740,000 cases each year. In Indonesia, the Ministry of Health of the Republic of Indonesia (2023) noted that the prevalence of bronchopneumonia in toddlers reached 4.8% in 2019 and decreased to 4.3% in 2022. Data from the North Sumatra Provincial Health Office in 2023 shows a prevalence of 3.7%, while in Dairi Regency it is recorded at around 2.9%. These figures indicate that bronchopneumonia is still one of the child health problems that requires serious attention, particularly in the implementation of interventions that support the comprehensive recovery of children's respiratory health.

Physiologically, bronchopneumonia causes inflammation and infection in lung tissue, thereby disrupting gas exchange in the alveoli. Children with this condition often show symptoms such as shortness of breath, rapid breathing, use of accessory breathing muscles, and fatigue due to increased breathing effort. This condition carries a risk of hypoxemia and severe complications if not treated properly (Blasi & Mantero, 2019; Kuti & Nicolau, 2020). Conventional management generally focuses on pharmacological therapy in the form of antibiotics, nebulization, and oxygen administration. However, non-pharmacological supportive interventions that play a role in improving comfort and the effectiveness of medical therapy are often not optimally utilized in pediatric nursing practice.

One non-pharmacological approach that is gaining attention is eucalyptus oil aromatherapy (Melaleuca leucadendra). The main component in this oil, 1,8-cineole (eucalyptol), has anti-inflammatory, expectorant, and decongestant effects that help relieve the respiratory tract and normalize breathing patterns (Sukmasari et al., 2020; Juergens et al., 2020). Research shows that eucalyptus oil aromatherapy can reduce breathing frequency, improve breathing patterns, and increase comfort in patients with respiratory disorders (Nofiasari & Hartiti, 2022; Amelia, 2021). However, most studies conducted have focused on adult populations or been conducted in laboratories, while its application in the context of pediatric nursing care in hospitals, particularly at Sidikalang Regional General Hospital, has not been extensively researched.

These conditions indicate a scientific gap in pediatric nursing practice, particularly in the application of aromatherapy as a complementary therapy for breathing disorders caused by bronchopneumonia. Therefore, this study was conducted to explore the application of eucalyptus oil aromatherapy in toddlers with bronchopneumonia at Sidikalang Regional General Hospital in 2025. Through this study, it is hoped that empirical evidence will be obtained to support the use of aromatherapy as a complementary therapy in evidence-based nursing care, in order to improve the effectiveness of care and the comfort of children during the healing process.

RESEARCH METHODE

This research used a descriptive case study design, aiming to illustrate the application of eucalyptus oil aromatherapy to help manage respiratory disorders in toddlers with bronchopneumonia. This approach was chosen because it allowed the researcher to directly explore the nursing process being implemented and assess changes in the subjects' condition after the intervention and throughout the treatment period.

Results and Discussion

Research Results

This study was conducted in the Melur pediatric ward at Sidikalang Regional Hospital and involved two toddlers diagnosed with bronchopneumonia and respiratory disorders. Aromatherapy intervention using eucalyptus oil was administered for seven (7) consecutive days, with two sessions per day. The treatment was administered through indirect inhalation and application to the chest and back for 15–20 minutes per session.

Before the intervention, both subjects showed symptoms of rapid and shallow breathing, cough with phlegm, use of accessory respiratory muscles, coarse rhonchi breath sounds, restlessness and difficulty sleeping due to shortness of breath. The results of the observation showed that the respiratory frequency of the first subject (1) was 48 times per minute and the second subject (2) was 42 times per minute. After applying aromatherapy for seven days, there was a decrease in respiratory frequency in the first subject (1) the respiratory frequency became 30 x / minute, the second subject (2) the respiratory frequency became 29 x / minute, regular breathing rhythm, the use of accessory muscles was not seen and the rhonchi breath sounds were soft, the subjects appeared more relaxed, and no allergic reactions were found to eucalyptus oil.

Subject	Day	Respiratory Rate (breaths/min)	Clinical Condition	Notes
1	Before	48	Shortness of breath, restlessness, cough with phlegm Fast and shallow breathing, cough with phlegm, use of accessory muscles, coarse rhonchi, restlessness and difficulty sleeping	Ineffective breathing Pattern
1	After (Day 7)	30	Regular breathing, regular breathing rhythm, use of accessory muscles is not visible and the breath sounds are fine, the subject appears more relaxed.	Effective breathing
2	Before	42	Shortness of breath, restlessness, cough with phlegm Fast and shallow breathing, cough with phlegm, use of accessory muscles, coarse rhonchi, restlessness and difficulty sleeping	Ineffective Breathing Pattern
2	After (Day 7)	29	Regular breathing, regular breathing rhythm, use of accessory muscles is not visible and the breath sounds are fine, the subject appears more relaxed.	Effective breathing

The results show a marked improvement in the breathing patterns of both subjects after eucalyptus oil aromatherapy intervention. The children became calmer, their breathing frequency decreased, and the quality of their rest improved, indicating an increase in the effectiveness of air exchange in the lungs.

DISCUSSION

The results of this study show that eucalyptus oil aromatherapy is effective in helping to stabilize the breathing patterns of toddlers with bronchopneumonia. The decrease in

respiratory rate and increase in comfort indicate that the active compound 1,8-cineole (eucalyptol) in eucalyptus oil works physiologically to improve respiratory function. This compound has mucolytic, expectorant, and bronchodilator effects that can thin secretions, dilate the bronchi, and reduce air resistance in the respiratory tract (Juergens et al., 2020).

These findings support previous research by Nofiasari & Hartiti (2022), which stated that eucalyptus oil inhalation can reduce respiratory rate and improve lung ventilation efficiency in children. Meanwhile, Amelia's (2021) research adds that the aroma of eucalyptus oil can stimulate the parasympathetic nervous system, which plays a role in inducing relaxation and improving unstable breathing patterns. Thus, the physiological and psychological effects of aromatherapy work synergistically to improve children's breathing patterns.

From a nursing perspective, this intervention serves as a non-pharmacological complementary therapy that supports the effectiveness of primary medical therapies such as nebulization and antibiotic administration. These results are in line with the principles of holistic nursing care, in which nurses play a role not only in medical aspects but also in improving patients' emotional comfort. By applying aromatherapy, nurses can provide a more comprehensive approach to pediatric patients with respiratory disorders.

Mechanistically, eucalyptol has been shown to suppress the production of inflammatory mediators such as prostaglandins and cytokines, thereby reducing inflammation and edema in the airways (Sukmasari et al., 2020). This process helps facilitate airflow to the lungs and reduces the work of the respiratory muscles. On the other hand, the aroma stimulation of eucalyptus oil also affects the limbic system in the brain, which is related to emotion regulation, thereby reducing stress and inducing a sense of calm (Ragil, Murniati & Cahyaningrum, 2023).

These findings also reinforce Bangko's (2021) report stating that eucalyptus aromatherapy can improve patient comfort, improve lung ventilation, and is safe to use without significant side effects. Therefore, the application of eucalyptus oil aromatherapy can be used as an evidence-based intervention alternative in pediatric nursing care, especially for patients with breathing patterns due to bronchopneumonia.

CONCLUSION

The results of this study indicate that eucalyptus oil aromatherapy has a positive effect on improving breathing patterns in toddlers with bronchopneumonia. After three days of intervention, there was a significant decrease in respiratory rate and an increase in comfort in

both research subjects. This effect was obtained from the active compound 1,8-cineole (eucalyptol), which has expectorant, bronchodilator, and anti-inflammatory properties, thereby helping to facilitate air circulation in the respiratory tract and reduce symptoms of shortness of breath.

These results indicate that the use of eucalyptus oil aromatherapy can be used as a non-pharmacological complementary therapy in pediatric nursing practice, particularly for treating breathing disorders caused by bronchopneumonia. This intervention not only supports the physiological healing process, but also provides a relaxing effect that improves the comfort and calmness of children during treatment.

As a follow-up, further research with a larger number of respondents and an experimental research design is needed so that the effectiveness of eucalyptus oil aromatherapy can be proven more strongly and applied more widely in the context of pediatric nursing and other respiratory disorders.

ACKNOWLEDGEMENT

The author would like to express his deepest gratitude to the Director of Sidikalang Regional General Hospital and all nurses in the Melur children's ward for their permission, support, and cooperation during the research process. Appreciation is also extended to the Medan Ministry of Health Polytechnic, particularly the Nursing Department, for providing guidance, mentoring, and academic support in the preparation of this research.

Thanks are also extended to the Medan Ministry of Health Polytechnic Health Research Ethics Committee for providing ethical approval, as well as to the parents and families of patients who were willing to participate in and support the implementation of this research. The author also thanks all parties who have helped, either directly or indirectly, in the process of data collection, analysis, and preparation of this research report.

May all the assistance and support provided become a valuable contribution to the advancement of science, especially in the development of pediatric nursing practices in the future.

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