



## NURSING CARE OF AIRWAY CLEARANCE INEFFECTIVE IN CHILDREN WITH PNEUMONIA: A CASE REPORT

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### Case Report

### ABSTRACT

**Introduction:** pneumonia is one of the acute lower respiratory tract infectious diseases with symptoms of cough and accompanied by shortness of breath caused by infectious agents such as viruses, bacteria, mycoplasma and aspiration of foreign substances, in the form of pneumonia accompanied by exudation and consultation. Airway clearance is not effective in many pneumonia patients. The aim of the study to get an overview and experience in providing pediatric nursing care with airway clearance is not effective in pneumonia. **Methods:** this research uses qualitative method type case study with nursing process approach. The subjects in this study amounted to 3 patients diagnosed with pneumonia with nursing problems of ineffective airway clearance in the Orchid Room of RSUD Ibnu Sina Gresik in research data collection techniques, namely interviews, observations and documentation studies. **Results:** based on the main assessment of the three patients, it was found that the patient had a cough and shortness of breath. The nursing diagnosis that emerged was that airway clearance was ineffective associated with retained secretions. The focus intervention carried out is teaching effective cough and doing chest physiotherapy. After 3 days of nursing action by the researcher each obtained an evaluation on the third day of cases 1, 2 and 3 the problem was partially resolved. **Conclusions:** The selection of intervention is an important factor when conducting airway clearance nursing care is not effective to prevent contraindications so as to speed up the patient's recovery.

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### INTRODUCTION

Pneumonia is still listed as a major health problem in children in developing countries. Among the five deaths of toddlers, one was caused by pneumonia, but there is not much attention to this disease so pneumonia is also called the forgotten killer of children (Bulechek, G.M., Butcher, H.K., Dochtmen, J.M & Wagner, 2015). Because the toddler's immune system is low and easily attacked by bacteria, viruses and fungi, if bacteria enter the respiratory tract it will cause inflammation in the lung parenchyma which is characterized by symptoms of heat, coughing, to shortness of breath, sputum production Excess (Ngastiyah, 2014). Children under 5 years of age are unable to expel phlegm or mucus independently and children swallow sputum more often. In children with pneumonia there is often a problem of ineffectiveness of airway clearance caused by accumulation of sputum or mucus. As a result, if the airway clearance is not resolved, it will cause the body to lack oxygen. ineffectiveness of airway clearance is a major problem, because the impact of sputum discharge that is not smooth can

cause sufferers to experience difficulty breathing and impaired gas exchange in the lungs resulting in cyanosis, fatigue, apathy and feeling weak, in the next stage will experience narrowing of the airway which can cause airway obstruction (Nugroho, 2011).

According to the World Health Organization (WHO), 15% of death of children under 5 years of age were caused by pneumonia in 2017 more than 800,000 children. More than 2 million children die each year from pneumonia (WHO, 2019). The number of realization of pneumonia cases in Indonesia from 2019 to early 2020 was 466,524 cases or 52.7% of the estimated number of cases in 2019. Based on the East Java Health Profile in 2018 there is at there were 100,528 cases, 6,824 cases in 2019 and 77,203 in 2020. Based on the Health Profile of Gresik Regency in 2018 there were 6,842 cases, in 2019 there were 6,424 cases, in 2020 there were 5,081 cases. At Ibnu Sina Gresik Hospital in 2021 in January - June, data on 25 cases of pneumonia were obtained.

Children with pneumonia will experience respiratory problems caused by inflammation in the alveoli of the lungs. This infection will cause an increase in sputum production which will cause disruption of airway clearance, nasal lobe breathing, and dyspnea. Ineffective airway clearance which means the inability to clear secretions or airway obstruction has limitations characteristic of coughing, dyspnea, additional breathing sounds and changes in breath frequency (Popovsky & Florin, 2021). If the success of this airway is disrupted, it inhibits the fulfillment of oxygen supply to the brain and cells throughout the body, if left for a long time this situation will cause hyposechemia then continue to develop severe hypoxia, and decreased consciousness and death from clinical signs that appear in patients with pneumonia (Mediarti & Rehana & Abunyamin, 2018).

To solve the nursing problem of ineffective airway clearance can be given nursing measures, namely by airway management and chest physiotherapy. According to (Mediarti & Rehana & Abunyamin, 2018) doing chest physiotherapy is one of the physiotherapies that uses postural drainage, vibration and percussion

techniques. Chest physiotherapy is very effective in removing secretions and improving ventilation in patients with impaired lung function

## MATERIALS AND METHODS

Case studies are a series of scientific activities carried out intensively, in detail and in depth about a program, event, and activity, both at the level of individuals, groups of people, institutions, and organizations to obtain in-depth knowledge about the event (Lee, 2017). The participants used in this study were two patients who developed pneumonia. Data assessment includes subjective data and objective data, then analyzed, determined nursing diagnosis, intervention, implementation, and evaluation. In discussing the data obtained, they are compared with each other by adhering to holistic and contextual principles. Five stages of the nursing process starting from the assessment of participants to evaluation were carried out in the Orchid room of RSUD Ibnu Sina Gresik for three days of treatment. Furthermore, it is presented in a narrative of facts in the field and relevant theories, so that research is carried out for nursing care in children with pneumonia.

## RESULTS

Based on the assessment of the two participants, the following results were obtained

**Table 1.** Nursing Care Assessment

Participants Data	Participants I	Participants II
Subjective data	The patient's mother said the patient was short of breath, persistent cough and runny nose	The patient's family said the patient experienced tightness, coughing, runny nose and nausea.
Objective Data	<ol style="list-style-type: none"> <li>1. Rapid and shallow breathing</li> <li>2. Attached O2 Nasal 2 lpm</li> <li>3. The presence of additional ronchi breathing sounds</li> <li>4. There is nasal lobe breathing</li> <li>5. There are breathing muscles</li> <li>6. There are secretions on the nose of viscous white color</li> <li>7. Dry lip mucosa</li> <li>8. Observasion vital signs:</li> <li>9. pulse: 124x/meant</li> <li>10. temperature: 37.7°C</li> <li>11. Respiratory: 44x/min (normal Respiratory toddlers 22-34x/min)</li> </ol>	<ol style="list-style-type: none"> <li>1. Rapid and shallow breathing</li> <li>2. Attached O2 Nasal 2 lpm</li> <li>3. The presence of additional ronchi breathing sounds</li> <li>4. There is nasal lobe breathing</li> <li>5. There are breathing muscles</li> <li>6. There are secretions on the nose of viscous white color</li> <li>7. Dry lip mucosa</li> <li>8. Observation vital signs:</li> <li>9. pulse: 124 /m</li> <li>10. temperature: 37,7°C</li> <li>11. Respiratory: 44x/min (normal Respiratory for toddlers 22-34x/min)</li> </ol>

The results of data analysis found that the nursing problem of airway clearance is not effective related to restrained secretion and the presence of additional breathing sounds (ronchi) (D.0001). Nursing intervention and implementation is carried out by doing: A.Observation : 1. monitor breath patterns (frequency, depth of breath effort), 2. monitor additional breath sounds, 3. monitor sputum (amount, color, aroma), B. Therapeutic: 1. Position semi-Fowler or Fowler, 2. do physiotherapy: clapping and vibration, 3, give warm drink, 4. Give oxygen: ncanul origin 2 lpm, C. Collaboration: 1. administration of bronchodilators, expectorants, mucolytics, if necessary, 2. ventolin nebulizer 1cc.3. Gentamicin injection 2x30 mg. Evaluation after nursing for 3x24 hours airway clearance of both participants increased with signs of good general condition, no sputum, no use of breathing muscles, no additional breathing sounds, improved breathing patterns, improved breathing frequency, vital signs :temperature: 36.5°C, pulse: 98x/min, Respiratory:28x/min.

## DISCUSSION

Pneumonia is a set of symptoms caused by various organisms. Pneumonia or lung parenchymal infection is caused by inflammation of the lungs resulting in histopathological abnormalities and clinical symptoms present in pneumonia (Popovsky & Florin, 2021) Air exposure, cigarette smoke contains particles such as polycyclic hydrocarbons, carbon monoxide, nicotine, nitrogen oxides and acrolein that can cause damage to ciliated epithelium, decrease mucociliary clearance function suppress phagocyte activity and bacterioside effects on the pulmonary defense system (Martner et al., 2009).

In patients with pneumonia, typical symptoms such as fever, chills, sweating, coughing (either non-productive or productive or producing slimy, purulent, or blood spots), chest pain due to pleurisy and tightness. Another common symptom is that patients prefer to lie on the affected side with knees bent due to chest pain (Rodrigues & Groves, 2018).

According to the SDKI DPP PPNI Working Group Team (DPP PPNI, 2018a), signs and symptoms of pneumonia patients with airway clearance are not effective in accordance with Indonesian nursing diagnosis standards there are major signs and symptoms and minor symptom signs which are described as follows: a. Major data 1) Subjective: not available. 2) Objective: Ineffective cough, inability to cough, excess sputum, wheezing, wheezing and/or dry ronkhi. b. Minor data 1)

Subjective : Dyspnea, difficulty speaking, orthopnea. 2) Objective: Restlessness, cyanosis, decreased breathing sounds, variable breath frequency, altered breathing patterns. Ineffective airway clearance is the inability to clear airway secretions or obstructions to maintain a patent airway. The signs and symptoms caused such as, ineffective coughing, excessive sputum, wheezing breathing sounds, wheezing and ronkhi (DPP PPNI, 2018c).

The nursing diagnosis established on pneumonia problems is ineffective airway clearance (D. 0001). Airway clearance is the inability to clear airway secretions or obstructions to maintain the passage nafas remains patent (DPP PPNI, 2018a) Nursing intervention according to (DPP PPNI, 2018b) nursing for the diagnosis of naf as road cleaning is not effectively related to naf as road spasm(D.0001), namely naf as road management increase (I.01011).

## CONCLUSIONS

Based on the results of research and discussion and research objectives of case studies of nursing care in children with ineffective airway clearance, there is a compatibility between theory and facts in the field, namely airway management is improved by using independent intervention by doing physiotherapy: clapping and vibration, semi-fowler positioning, collaborative administration of bronchodilator drugs, intravenous fluid administration, education so that nursing problems have been resolved in accordance with the predetermined plan.

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