

THE IMPLEMENTATION OF EFFECTIVE COUGH TECHNIQUES AND DEEP BREATHING RELAXATION TECHNIQUES IN PATIENT WITH BRONCHIAL ASTHMA: A CASE STUDY

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Background. Asthma is a heterogeneous disease characterized by chronic inflammation of the airways that causes bronchial hyperactivity. Children with respiratory tract disorders often experience an increase in excessive mucus production in their lungs, mucus/phlegm often accumulates and becomes thick making it difficult to be expelled. Management of asthma in children can be carried out pharmacologically and non-pharmacologically. Non-pharmacological therapy can be done in various ways, including effective coughing exercises and deep breathing relaxation techniques. **Methods.** Case study research on one participant (An. A). This research was conducted for three consecutive days in general hospital in banyumas with a duration of five minutes for each intervention. Both interventions were carried out once a day after being given nebulizer pharmacological therapy. **Results.** Intervention of effective cough techniques and deep breathing relaxation techniques has an impact on expelling sputum (phlegm) and can improve respiratory frequency in children. **Conclusion.** Practicing effective coughing can reduce symptoms of coughing up phlegm thereby helping to expel sputum while deep breathing relaxation techniques can increase oxygen saturation and decrease respiratory frequency. Both of these non-pharmacological therapies can be carried out well independently.

KEYWORDS

Bronchial asthma, effective cough techniques, deep breathing relaxation techniques

INTRODUCTION

Asthma is a heterogeneous disease characterized by chronic inflammation of the airways which causes bronchial hyperactivity to external stimuli such as; house dust, animal dander, smoke and other materials that can cause allergies (Octaviani et al. 2023). Asthma is the eighth cause of death from existing data in Indonesia with a prevalence of asthma symptoms from initially 4.2% to 5.4 (Harsismanto et al. 2020). Children who experience respiratory tract disorders often experience an increase in excessive mucus production in their lungs, mucus/phlegm often accumulates and becomes thick making it difficult to be expelled, disruption of the transportation of phlegm can cause sufferers to find it increasingly difficult to expelled phlegm (Aryayuni & Siregar 2019).

Parents' knowledge about asthma can determine how much effort is made to prevent

recurrence in children. Nurses have an important role to carry out early prevention of recurrence of asthma by providing health education about asthma. Health education is a process of change that leads to the attainment of health goals for both individuals and society. Health education can increase the knowledge of parents who have children with asthma and prevent asthma recurrences. Health education is the application of concepts in education in the health sector, one of the improvements can be influenced by information factors. Better knowledge from parents who have children with asthma can prevent recurrence of asthma which continues to increase (Widyasari & Irdawati 2023). Asthma management in children can be done pharmacologically and non-pharmacologically. Non-pharmacological therapy can be done in various ways, including: effective coughing exercises and deep breathing relaxation techniques. Effective coughing exercises can

overcome tightness and help expel phlegm in the respiratory tract due to the influence of necrosis and help clear the airways (Suprayitna, Asrianti & Arifin 2022) . Meanwhile, deep breathing relaxation can increase cough efficiency, improve alveoli, maintain gas exchange, prevent atelectasis, relax tense muscles and increase breathing (Octaviani et al. 2023) .

The use of effective cough therapy and deep breathing relaxation techniques is still rarely applied by nurses in hospitals and only pharmacological treatment of bronchial asthma, therefore, based on the description above, the authors are interested into analyze the effect of effective cough technique intervention & deep breathing relaxation techniques on patient An. A with bronchial asthma.

METHODS

This research is a case study research on one sample (An. A) . This research was conducted for three consecutive days at a public hospital in Banyumas district with a duration of five minutes for each intervention. Both of these interventions were carried out once a day after being given nebulizer pharmacological therapy.

Before and after the intervention, the researchers assessed the patient's respiratory rate and sputum production. Intervention by providing effective coughing techniques and deep breathing relaxation techniques helps in removing secretions and breathing frequency becomes normal. This research is an adaptation of research (Nugroho et al. 2023) and (Octaviani et al. 2023) .

RESULTS AND DISCUSSION

Nursing interventions were carried out for 3 days at a public hospital in Banyumas on 11-13 November 2022. The implementation was carried out namely effective cough techniques and deep breathing relaxation therapy. Implementation is carried out pharmacologically and non-pharmacologically, pharmacological therapy is given via intravenous ceftriaxone 2x1gr, ranitidine 2x25mg, dexametasone 3x5mg, paracetamol (if fever > 39) 280mg, oral administration, namely cetirizine syrup 2x1/2ct and salbutamol 2mg/8hours. Apart from that, nebulization was given with Ventolin.

After being given pharmacological therapy followed by giving non-pharmacological therapy by practicing effective coughing and deep breathing relaxation techniques. The results of the research on Effective Cough Technique & Deep Breathing Relaxation Technique Case Studies in Patient An. A with Asthma obtained the following data:

Table 1. Evaluation Results During the Implementation of Effective Cough Techniques and Deep Breathing Relaxation

Date	Evaluation	Before	After
11/11/2022	Breathing frequency	32x/minute	30x/minute
	Additional breath sounds	+ Wheezing	+ Wheezing
	oxygen saturation	93%	94%
	Sputum discharge	-	1 cc
12/11/2022	Breathing frequency	26x/ minute	24x/minute
	Additional breath sounds	+ Wheezing	+ Wheezing
	oxygen saturation	94%	94%
	Sputum discharge	1cc	1.5cc
13/11/2022	Breathing frequency	22x/minute	22x/minute
	Additional breath sounds	-	-
	oxygen saturation	95%	95%
	Sputum discharge	0.5cc	0.5cc

In carrying out this implementation the

researcher first approached An. A and the parents, then continued by applying nurse communication techniques in order to build a trusting relationship.

This is in line with the research of A. Pulungan et al (2017) which states that an approach with children who are being treated in hospital can be said to have special techniques to adapt to children and make children feel comfortable with nurses because children who experience hospitalization pain responds to protest, despair, and rejection due to separation.

The feelings that often appear are anxiety, anger, sadness, fear, and guilt. These forms of anxiety are shown in the desire to continue to be with their parents, crying, and moaning. Efforts made in adapting to children, namely, approaching parents so that children feel comfortable.

After the nurse applies therapeutic communication techniques, it will make the child understand and the child calm down, and is also supported by the appearance of medical personnel who are neat or good, making the child cooperative when nursing actions are carried out, so that nursing actions can be carried out optimally (Fuadah, Diana & Sulis 2021) .

Based on the implementation results, effective coughing techniques and deep breathing relaxation techniques have made changes to make the patient's airway better.

Someone who has asthma is prone to narrowing the airways. A narrow airway coupled with a pile of uncontrolled secretions will increase the severity of asthma sufferers. Therefore, effective

coughing techniques need to be taught to patients who experience accumulation of secretions so that they are able to remove secretions independently. This can support the patient's healing process (Nugroho et al. 2023)

Effective coughing exercises can help loosen and relieve the respiratory tract and overcome shortness of breath due to mucus filling the respiratory tract. Effective coughing techniques aim to overcome tightness and help expel phlegm in the respiratory tract due to the influence of necrosis and help clear the airways (Suprayitna, Asrianti & Arifin 2022) .

The implementation of effective coughing exercises was successfully carried out with indications of decreased respiratory rate, increased oxygen saturation level, decreased additional breath sounds, no chest wall retraction and normal body temperature. This is because effective coughing exercises are a method of coughing properly, where patients can save energy so they don't get tired easily and can expel phlegm to the fullest (Wartini, Immawati & Dewi 2021) .

This is also in line with research (Nugroho et al. 2023) where there is an effect of the treatment given to the patient's condition. Provision of effective cough therapy can encourage secretions to come out of the airways so that they are easier to expel. The patient's airway is free from blockages so that air entering during inspiration is more optimal and improves the function of the alveoli in gas exchange.

Deep breathing relaxation can train the diaphragm muscles which are used to compensate

for lack of oxygen and increase respiratory efficiency so as to reduce shortness of breath. Breathing exercises that are done repeatedly on a regular basis can train the respiratory muscles, reduce the severity of respiratory disorders, reduce symptoms of *dyspnea*. If there is an increase in perfusion and repair of the alveoli which can increase oxygen levels in the lungs which can cause an increase in oxygen saturation (Astriani et al., 2021).

Deep breathing techniques are effective in increasing oxygen saturation and reducing respiratory frequency. This can be used as an initial action to prevent problems that will arise and if someone suddenly experiences shortness of breath, deep breathing techniques can be carried out independently because there is no need to use special tools (Octaviani et al. 2023).

This theoretically can be explained that the presence of deep breathing relaxation techniques can provide a form of professional support and social support that can have both a physical and psychological effect so that patients feel calmer and ultimately respiratory symptoms can decrease (Fithriana, Atmaja & Marvia 2017).

In line with research (Octaviani et al. 2023) that there is an effect of deep breathing relaxation techniques on changes in oxygen saturation values and respiratory frequency of bronchial asthma patients at the Emergency Room of Embung Fatimah Hospital, Batam City in 2022, it was found that there was a significant difference in oxygen saturation values and respiratory frequency of asthmatic patients bronchial, where the increase in oxygen

saturation increases more rapidly by administering deep breathing relaxation techniques, as well as the respiratory rate dropping faster to normal by administering deep breathing techniques. It is proven that giving deep breathing techniques makes the recovery of bronchial asthma patients faster.

Based on the results of the research that has been done, it can be diagnosed that the diagnosis of an ineffective airway is partially resolved, and the ineffective breathing pattern is resolved with the following outcome criteria:

Table 2 Diagnostic output Ineffective airway clearance and ineffective breathing pattern pre and implementation

Diagnosis	Indicator	Beginning	Objective	End
Ineffective airway clearance	Effective cough	2	4	3
	Sputum production	2	4	3
Ineffective breathing pattern	dyspnea	2	4	4
	Breathing frequency	2	4	4

Based on table 2 it can be concluded that the provision of effective cough technique interventions and deep breathing relaxation techniques has an impact on expelling phlegm and can make the child's normal respiratory frequency improve.

These two non-pharmacological therapies can be applied by nurses to patients with bronchial asthma, considering that most nurses in hospitals have not implemented non-pharmacological therapies and still prioritize giving pharmacological therapy.

LIMITATIONS

The limitations in this study were that the implementation was only carried out by one participant and did not use health education media, only that it was explained orally for 3 days

CONCLUSIONS AND RECOMENDATIONS

An. A with a diagnosis of ineffective airway clearance bd retained secretions and ineffective breathing patterns bd obstructed respiratory effort after non-pharmacological implementation, the implementation results show that effective cough training can reduce symptoms of coughing up phlegm thereby helping to expel sputum while deep breathing relaxation techniques can improve oxygen saturation and decreased respiratory rate. These two non-pharmacological therapies can be carried out well independently.

Based on the implementation results in this scientific research article, it is hoped that effective cough techniques and deep breathing relaxation therapy can be carried out in hospitals and nurses can teach effective coughing and deep breathing relaxation techniques for bronchial asthma patients in accordance with established standard operating procedures

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