Original Research

IJNHS

A Case Study of Pursued Lip Breathing to Prevent Asthma Relapse

Ikna Cahyadi Kurniawan[1], Henri Setiawan[1]

[12]STIKes Muhammadiyah Ciamis, Jawa Barat

Article info

Article history:
Received: June 21st, 2022
Revised: July 23rd, 2022
Accepted: July 23rd, 2022

Correspondent author:
Name: Henri Setiawan
Address: Ciamis, West Java
E-Mail:
henrisetiawan1989@gmail.com / gemaltc@yahoo.co.id

International Journal of Nursing and Health Services (IJNHS)
Volume 5, Issue 6, December 20th, 2022
DOI: 10.35654/ijnhs.v5i6.621
E-ISSN: 2654-6310

Abstract

Introduction: Asthma is a disease that affects the human respiratory system, so this disease can be categorized as a group of immune diseases that attack the respiratory system. One of the non-pharmacological therapies for asthma can be pursued through lip breathing (PLB) exercise. **Objective**: This case study was conducted to describe the pursed lip breathing intervention in reducing shortness of breath in asthmatic clients. **Method**: This study used a case study design with an evidence-based practice implementation approach focusing on nursing interventions. The research was conducted at the BLUD of Banjar City General Hospital on 27-31 May 2022. The participant in this study was Mrs. S, 65 years old female with the main problem of shortness of breath. The process of assessing and establishing a diagnosis is focused on the main problem. Objective and subjective data become a reference for periodic evaluation of nursing implementation. **Result**: According to the client's admission, asthma usually recurs every 1-2 weeks because of strenuous and tiring activities. However, when confirmed on June 20th, 2022, the client admitted that he had not relapsed. **Conclusion**: The pursed-lip breathing intervention is supposed to effectively reduce shortness of breath in asthmatic clients, as evidenced by the client's subjective acknowledgment, although it has not been supported by normal breathing frequency as an indicator of physical health. **Recommendation**: Theoretically, this research does not conflict with previous research, so it can be a reference in future research. Clinically, pursued lip breathing intervention can be an alternative to reduce shortness of breath in clients with chronic diseases such as asthma in hospitals and health centers.

Keywords: asthma, dyspnea, pursued lip breathing

INTRODUCTION

Asthma is a disease that affects the human respiratory system, so this disease can be categorized as a group of immune diseases that attack the respiratory system. Respiratory tract disease is the second most common cause of death after vascular disorders (1). According to data from the World Health Organization (WHO), the number of people living with asthma globally reaches 300 million. This figure is estimated to increase to 400 million people by 2025. Asthma is one of the top 5 causes of death worldwide. It is estimated that 250,000 people die each year due to asthma (2). The prevalence of asthma worldwide varies widely, and epidemiological studies show an increasing incidence of asthma, especially in developed countries (3).

One of the non-pharmacological therapies for asthma can be pursued through lip breathing (PLB) exercise (4). The primary purpose of PLB exercise in people with asthma is to do proper breathing. In people with asthma, breathing exercises aim not only to improve the function of the respiratory system but also to train the function of the respiratory system if it feels like an attack is coming or during an asthma attack. Each asthma exercise movement is specifically aimed at improving the flexibility of the chest cavity so that it can expand and contract optimally and improve the flexibility and strength of the body cavity insulation so that abdominal breathing is optimal (5).

In asthma management, we should be sure that the disease has a cure and an antidote, as described in the Qur'an in Surah Yunus verse 57:

> *"Meaning: O people! Indeed, there has come to you a lesson (Qur'an) from your Lord, a cure for the disease that is in the chest and guidance and mercy for those who believe"(Q.S Yunus: 57).*

As explained in the Qur'an Surah Yunus Verse 57 above, every disease that Allah Subhanahu Wa Ta'ala has sent down is a cure. The Qur'an is the antidote for doubts that attack the heart. The Qur'an is a guide to the right path and the Qur'an contains mercy for those who believe because they are the ones who use it.

The definition of asthma, according to the Global Initiative for Asthma (GINA), is a chronic inflammation of the airways accompanied by the role of mast cells, eosinophils, and T lymphocytes. Susceptible individuals show symptoms of recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing, especially at night or early morning. These symptoms are associated with extensive and variable airway obstruction partially reversible spontaneously or with treatment (6). These symptoms can lead to nursing diagnoses of ineffective breathing patterns.

An ineffective breathing pattern is an inspiration or expiration that does not provide adequate ventilation. Incidence of inefficient breathing patterns can be found in adult and pediatric patients. The state of the pulmonary health system strongly influences the effectiveness of the airway. An ineffective breathing pattern is a condition in which inspiration or expiration does not provide adequate ventilation (7). So that it causes shortness of breath in the patient, to reduce the shortness of breath, Pursed Lip Breathing intervention can be carried out.

Pursed Lip Breathing is breathing through the lips that can help train or strengthen the respiratory muscles, slow expiration, prevent small airways from collapsing, and control the rate and depth of breathing. Pursed lip breathing exercises help improve ventilation and increase the work of respiratory muscles (8). Previous research shows that pursed lip breathing exercises increase oxygen saturation in asthma patients, where the oxygen saturation of asthma patients increases from 89.7% before treatment to 97.8% after pursed lip breathing exercises (9).

Pursed Lip Breathing is essential as a combination of non-pharmacological therapies that can strengthen the respiratory muscles to reduce the potential for relapse.

So, when the immune response narrows the airway, the client can perform the Pursed Lip Breathing exercise to avoid a more severe condition. In nursing theory, PLB exercise is a form of self-care and resilience to clients initiated by Orem (10).

OBJECTIVE

This case study was conducted to describe the effect of pursed lip breathing intervention in preventing asthma relapse.

METHODS

This study uses a case study design with an evidence-based practice implementation approach that focuses on nursing interventions (14,15). The research was conducted at the BLUD RSU Banjar City on 27-31 May 2022. The participants in this study were Mrs. S, age 65, female, who complained of shortness of breath. The process of assessing and establishing a diagnosis is focused on the main problem. Objective and subjective data become a reference for periodic evaluation of nursing implementation. Data analysis was carried out by exploring accurate data and personal data before and after the intervention was given.

In giving the pursed lip breathing intervention, the client performs this technique by sitting in an upright and relaxed position, taking a deep breath for 3 seconds, then holding it for 2 seconds. After regular breathing, exhale, relax until the urge to breathe, and return to living normally for 10 seconds. This breathing is carried out for 5 minutes. The intervention is given for one day.

CASE PRESENTATION

Nursing Assessment

The client is Mrs. S, 65 years old, from Batularang village, Banjar Patroman, who came to the emergency room on May 27th, 2022, with complaints of asthma characterized by shortness of breath and anxiety. Previously, the client had no comorbidities and the family did not have a history of the same disease. The client is assisted by his family to the hospital with a person in charge of Mrs. A as his son.

At the time of examination of vital signs, the results were 23 breaths per minute, blood pressure 130/90 mmHg, temperature 36.5^0C, and pulse rate 90. The client had dyspnea and capillary refill time (CRT>2 seconds). The client's psychosocial status shows the anxiety obtained through the client's answers when interviewed by saying that he is worried that he will not recover and is experiencing severity. Spiritual data does not show a severe problem because the client says he is patient and trusting in his illness. The pattern of activity is disturbed when sick due to infusion, so the client needs help changing clothes. The sleep pattern is disturbed because the client complains that it is challenging to rest. The therapy given to the client is Omz, 3x50 paracetamol, ambroxol, and 1500 drops of RL infusion fluid. Complete blood counts were performed with normal results.

Nursing Diagnosis

The study found that psychologically emerging nursing problems were ineffective breathing patterns related to respiratory effort obstruction with the diagnosis number D. 0005 (16).

Nursing Intervention, Implementation, and Evaluation

Nursing interventions and activities need to be established to reduce, eliminate and prevent client nursing problems with ineffective breathing patterns (17) related to SDKI respiratory effort barriers, namely as follows:

Table 1. Nursing Intervention and Outcome

Nursing Outcome	Nursing Intervention
After 3x24 hours of nursing action, the problem of ineffective breathing patterns in the patient improved with the following indicators: a) Decreased dyspnea	Observation: a) Monitor breathing pattern b) Monitor breath sounds

b) Decreased use of accessory muscles for breathing c) Decreased expiratory phase lengthening d) Improved respiratory rate e) Breath depth improves	Therapeutic: a) Maintain a patent airway with the head tilt and chin lift b) Position semi fowler or fowler c) Give a warm drink d) Do chest physiotherapy e) Perform mucus suction in less than 15 seconds f) Perform the pursed lip breathing technique

In the implementation, some procedures are carried out for clients with ineffective breathing patterns related to respiratory effort barriers, maintaining a patent airway in a semi-Fowler's or Fowler's position, then giving a warm drink. After that, do the pursed lip breathing technique. According to the client's admission, asthma usually recurs every 1-2 weeks because of strenuous and tiring activities. However, when confirmed on June 20th, 2020, the client admitted that he had not relapsed.

According to what has been done on the client, an evaluation is obtained:

S: The client says that the shortness of breath is a little less

O: the client seems to use the accessory muscles of respiration with respiration 15x/minute

A: Ineffective breathing pattern related to respiratory effort obstruction

Q: Advise pursed lip breathing

I: Do the pursed lip breathing technique

E: The client understands the pursed lip breathing technique

R: Intervention stopped

DISCUSSION

Nursing care for clients with asthma respiratory disorders at the BLUD RSU Banjar City has been carried out by researchers comprehensively based on theories found in various sources. Nursing care procedures are carried out in 5 stages, including assessment, determination of diagnosis, intervention, implementation, and evaluation of nursing.

When conducting an assessment on Mrs. S on May 28th, 2022, the initial step is to check vital signs with a blood pressure of 130/90 mmHg (pre-hypertension), respiratory rate of 23 times per minute (tachypnea), temperature and pulse rate are within normal limits. According to research findings, on physical examination, a client with asthma appears to have several problems, especially vital signs and other examinations related to impaired oxygenation function, such as shortness of breath, tachycardia, hypertension, pallor, cold sweats, capillary refill time (CRT) > 2 seconds, and difficulty speaking (18,19). However, not all client complaints were found, such as tachycardia and difficulty saying.

Tachypnea and CRT are sufficient indicators to be considered in determining nursing diagnoses in the form of ineffective breathing patterns (20). Tachypnea is the body's compensation due to spastic contractions of the smooth muscles of the bronchioles, which causes difficulty breathing due to asthma (21). CRT is the time body tissues require to restore their color after the pressure is released, which is 2 seconds (22). In asthmatic clients, the CRT value can be more than 2 seconds because the intake of peripheral blood vessels is not maximal. Therefore, the diagnosis based on the assessment results is an ineffective breathing pattern. In theory, a weak breathing pattern is a condition in which inspiration and expiration do not provide adequate ventilation (23). The study found that nursing problems that appeared physiologically were ineffective breathing patterns related to respiratory effort barriers with the diagnosis number D.0005 on page 26 (16).

To overcome this problem, researchers conducted nursing interventions and implementations in accordance with Indonesian nursing intervention standards number I. 01011, page 187, including monitoring breathing patterns and additional breath sounds. We maintained a patent airway with a semi-Fowler's position, gave warm drinks, and maintained

oxygenation that was installed according to the doctor's recommendation of a 2-liter nasal cannula. However, researchers need to add non-pharmacological interventions in the form of pursed lip breathing techniques.

Pursed Lip Breathing is a breathing technique through the lips that can help train or strengthen the respiratory muscles, slow expiration, prevent small airways from collapsing, and control the rate and depth of breathing. Breathing pursed lip breathing promotes the activity of the parasympathetic nervous system, strengthening the respiratory muscles (24). Based on the literature, it was found that pursed lip breathing proved to be effective in supporting the respiratory muscles to prevent a recurrence. Research conducted by previous researchers states that pursed lip breathing can reduce dyspnea in clients with asthma and chronic obstructive pulmonary diseases. Hence, it is necessary to disseminate information to clients and families so they can do it independently (25).

According to the client's admission, asthma usually recurs every 1-2 weeks because of strenuous and tiring activities. However, when confirmed on June 20th, 2020, the client admitted that he had not relapsed. This shows that the pursed lip breathing intervention positively affected treating tachypnea, which is also suspected to prevent a recurrence. These results agree that pursed lip breathing effectively precludes the risk of asthma recurrence. This fact is supported by a theory explaining that hyperventilation is responsible for increased bronchospasm. It results from the body's efforts to hold carbon dioxide using a breathing technique whose basic principle is nasal breathing. The effect of turbulence in breathing caused by the narrowing of the airway will be reduced. So that ventilation-perfusion in the lungs will increase, and the conditions that cause the body to store excess carbon dioxide the body can be reduced (26).

CONCLUSION

The pursed-lip breathing intervention is supposed to effectively prevent asthma relapse based on the client's subjective acknowledgment. In addition, the researcher did not find a significant gap between theory and facts that hindered the results of the study, so this research does not conflict with research carried out by previous researchers. Theoretically, this research is evidence supporting previous research, so it is helpful for developing future research using higher methods such as experimental research. Clinically, pursued lip breathing intervention can be an alternative intervention to prevent asthma recurrence in hospitals and health centers.

REFERENCES

1. Santacroce L, Charitos IA, Ballini A, Inchingolo F, Luperto P, De Nitto E, et al. The human respiratory system and its microbiome at a glimpse. Biology (Basel). 2020;9(10):318.
2. Canguven O, El Ansari W, Yassin A. Vitamin D supplementation as a potential therapeutic mediator in asthma: does dose really matter? a critical review of the literature. Aging Male. 2018;
3. Sulistiyawati A, Pendet NMDP. Respiratory Rate Difference Before and After Pursed Lip Breathing Exercise on Asthma Patient in Pulmonary Polyclinic, TNI AU DR. M. Salamun Bandung Hospital. Basic Appl Nurs Res J. 2020;1(1):12–5.
4. Permatasari VD. Pengaruh Senam Asma Terhadap Fungsi Paru (KVP & FEV1) Pada Wanita Asma Di Balai Kesehatan Paru Masyarakat (BKPM) Semarang. J Kesehat Masy. 2015;10(2):65–80.
5. Sukmasari NPA, Wahyudi AB, Sabardilah A. The Meaning of Nouns in the Translation of the Quran Surah Yunus and Its Use as Learning Materials. In: International Conference of Learning on Advance Education (ICOLAE 2021). Atlantis Press; 2022. p. 604–8.
6. Berhe G, Shah D, Ahmad S, Shahid M. Clinical Use of Biologics and Biosimilars for Asthma. In: Biologics and Biosimilars. CRC Press; 2022. p.

281–300.
7. Rahmah AZ, Pratiwi JN. Potensi Tanaman Cermai dalam Mengatasi Asma. J Penelit Perawat Prof. 2020;2(2):147–54.
8. Chaves DBR, Pascoal LM, Beltrão BA, Leandro TA, Nunes MM, da Silva VM, et al. Classification tree for identifying ineffective breathing pattern in children with acute respiratory infection.
9. Avena MJ, Pedreira M da LG, Bassolli de Oliveira Alves L, Herdman TH, de Gutiérrez MGR. Frequency of respiratory nursing diagnoses and accuracy of clinical indicators in preterm infants. Int J Nurs Knowl. 2019;30(2):73–80.
10. Hill CJ, Lazzeri M, D'Abrosca F. Breathing exercises and mucus clearance techniques in pulmonary rehabilitation. In: Textbook of pulmonary rehabilitation. Springer; 2018. p. 205–16.
11. Khasanah S, Maryoto M. Efektifitas Posisi Condong Ke Depan (Ckd) Dan Pursed Lips Breathing (Plb) Terhadap Peningkatan Saturasi Oksigen Pasien Penyakit Paru Obstruktif Kronik (PPOK). Pros Semin Nas Int. 2014;VII(2012):25–36.
12. Amira Permata Sari Tarigan, Juliandi. Pernafasan Pursed Lip Breathing Meningkatkan Saturasi Oksigen Penderita Penyakit Paru Obstruktif Kronis (Ppok) Derajat Ii. J Keperawatan Indones. 2018;1(2):39–46.
13. Junaidin J, Syam Y, Irwan AM. Pengaruh Pursed Lip Breathing Dan Meniup Balon Terhadap Kekuatan Otot Pernapasan, Saturasi Oksigen Dan Respiratory Rate Pada Pasien Ppok. J Ilm Keperawatan (Scientific J Nursing). 2019;5(1):31–9.
14. Firmansyah A, Setiawan H, Ariyanto H. Studi Kasus Implementasi Evidence-Based Nursing: Water Tepid Sponge Bath Untuk Menurunkan Demam Pasien Tifoid. Viva Med J Kesehatan, Kebidanan dan Keperawatan. 2021;14(2):174–81.
15. Ariyanto H, Setiawan H, Oktavia W. A Case Study: Murotal Distraction to Reduce Pain Level among Post-Mastectomy Patients. Int J Nurs Heal Serv. 2021;4(3):325–31.
16. PPNI. Stadar Diagnosis Keperawatan Indonesia: Definisi dan Indikator Diagnostik. In: Edisi 1 Cetakan 3 Jakarta: DPP PPNI. 2016.
17. Suhanda, Setiawan H, Ariyanto H, Oktavia W. A Case Study: Murotal Distraction to Reduce Pain Level among Post-Mastectomy Patients Suhanda1,. Int J Nurs Heal Serv. 2021;4(3):325–31.
18. Kartikasari D. Asuhan Keperawatan Pada Klien Gagal Ginjal Kronik Dengan Masalah Gangguan Pertukaran Gas Di Ruang Hemodialisa Rsud Bangil Pasuruan. STIKes Insan Cendekia Medika Jombang; 2018.
19. Moore T, Cunningham S. Nursing skills in cardiorespiratory assessment and monitoring. Routledge; 2021.
20. James PT, Ali Z, Armitage AE, Bonell A, Cerami C, Drakesmith H, et al. The Role of Nutrition in COVID-19 Susceptibility and Severity of Disease: A Systematic Review. J Nutr. 2021;
21. Nakamura Y, Tamaoki J, Nagase H, Yamaguchi M, Horiguchi T, Hozawa S, et al. Japanese guidelines for adult asthma 2020. Allergol Int. 2020;69(4):519–48.
22. Ballaji HK, Correia R, Liu C, Korposh S, Hayes-Gill BR, Musgrove A, et al. Optical fibre sensor for capillary refill time and contact pressure measurements under the foot. Sensors. 2021;21(18).
23. Jevon P, Ramkumar K, Jenkinson E. Medical Student Survival Skills: The Acutely Ill Patient. John Wiley & Sons; 2019.
24. Chen X, Gong D, Huang H, Wang K, Zhang W, Li S. Expert consensus and operational guidelines on exercise rehabilitation of chronic obstructive pulmonary disease with integrating

traditional Chinese medicine and Western medicine. J Thorac Dis. 2021;13(6):3323.

25. Maharem TAS, Mohamed Mohamed AAER, Almanzlawi HAI. Acupressure versus Pursed Lip Breathing Techniques on Physiological Parameter and Dyspnea Grade among Patients with Chronic Obstructive Pulmonary Disease. Assiut Sci Nurs J. 2021;9(26.):15–20.

26. Lumb AB, Horncastle E. Pulmonary physiology. In: Pharmacology and Physiology for Anesthesia. Elsevier; 2019. p. 586–612.