Asian Journal of Community Services (AJCS)
Vol. 5, No. 6 2026: 285-300

The Effect of the Application of the Edurebusu Technique on Respiratory Function Parameters in Bronchial Asthma Patients: A Literature Review Study

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A R T I C L E I N F O

Keywords: Breathing Techniques, Bronchial Asthma, Respiratory Function Parameters

Received : 16, February
Revised : 18, April
Accepted: 20, June

A B S T R A C T

The advantages of the Buteyko breathing technique can reduce the frequency of asthma attacks (relapses), prevent severity, and reduce the dose of inhaled corticosteroids and improve PEFR to determine the effect of applying the EDUREBUSU technique on respiratory function parameters in bronchial asthma patients: Literature Review Study. The abstract includes the main components; however, the results are presented inconsistently. The manuscript states that 11 articles were analyzed, while the results mention findings from 10 articles. This inconsistency should be corrected. The findings from 10 articles indicate that there is an effect between the provision of Buteyko breathing techniques on increasing Respiratory Function Parameters (SpO2, respiratory rate and breath sounds) plus EDUREBUSU which stands for Education, Relaxation, Buteyko and Suas.

INTRODUCTION

Asthma is defined by the Global Initiative for Asthma as a complex and diverse condition. Its main characteristic is the presence of chronic inflammation of the respiratory tract. This condition is characterized by various clinical manifestations such as wheezing, difficulty breathing, shortness of breath, coughing, and variations in airflow restrictions (Patak & Jung, 2024). Asthma is a global health issue that not only affects developed countries, but also developing countries. According to data from WHO (2017), the global prevalence of asthma is still relatively high, estimated to reach 235 million sufferers worldwide. Asthma-related deaths, which account for about 250,000 deaths each year, occur most in poor and developing countries. The increase in the number of asthma sufferers is suspected to be closely related to deteriorating air quality and changes in people's lifestyles.

In Indonesia, the prevalence of asthma has increased, jumping from 4.2% to 5.4%, with the incidence rate in Aceh recorded at 2.3%. Based on data from the Health Office of the Republic of Indonesia in 2020, asthma is classified as one of the most common diseases suffered by the Indonesian population. This condition certainly affects the quality of life and productivity of the sufferer, for example by disrupting work performance or other daily activities (Ministry of Health, 2022). There are various factors that contribute to the increased likelihood of asthma symptoms recurring. These factors include genetic factors (heredity), exposure to allergens in the environment, interactions with internal microorganisms, respiratory infections, exposure to secondhand smoke, air pollution, active smoking habits, hazards in the work environment, overweight conditions, and psychological or emotional stress (Dwi et al., 2025).

Asthma management can be done through two main strategies: an approach that involves the use of drugs (pharmacological) and an approach that does not involve drugs (non-pharmacological) (Kronik et al., 2020). Non-pharmacological treatment includes several components, namely counseling, avoidance of triggering factors, physiotherapy, and deep breathing relaxation techniques (Husain et al., 2020). One of the interventions carried out in asthma patients to optimize lung ventilation is diaphragmatic breathing exercises. This exercise is done with maximum inspiration through the nose while reducing the activity of the respiratory muscles, so that it is able to increase perfusion and improve the performance of the alveoli. This aims to make oxygen diffusion effective, which will ultimately increase oxygen levels in the lungs and increase oxygen saturation (Yulia et al., 2019). Meanwhile, deep breathing relaxation is a nursing act in which nurses educate patients on how to take deep breaths, breathe slowly (maintain maximum inspiration), and exhale slowly (Dwi et al., 2025)

The aim of this review literature was to assess the effectiveness of respiratory relaxation techniques in reducing the rate of shortness of breath in asthma patients and to explain changes in patients' conditions before and after the application of the intervention. In addition, the study aimed to analyze the patient's reactions, identify the physiological mechanisms underlying the advantages of deep breathing relaxation techniques, as well as examine the factors that influence the successful implementation of them. This literature review aims to evaluate the alignment of previous research results, identify possible obstacles in the implementation of interventions, and formulate evidence-based practice recommendations to support the use of respiratory relaxation techniques as an effective nonpharmacological intervention for asthma patients.

Complications from asthma treatment can be prevented by providing therapy renewal, namely by providing companion therapy (non-medical therapy). Non-medical therapy aims to achieve a normal lifestyle, avoid attacks, and restore optimal lung function (Bruurs, Van Der Giessen & Moed, 2023). The non-pharmacological therapy given as pharmacological companion therapy is the buteyko breathing technique. According to Cooper et al, (2023) the buteyko breathing technique is a breathing technique developed specifically for bronchial asthma patients.

The advantages of buteyko breathing techniques can reduce the frequency of asthma attacks (recurrences), prevent severity, and lower the dose of inhaled corticosteroids as well as improve PEFR. In addition, buteyko breathing techniques can stop coughing, nasal congestion, shortness of breath, wheezing, and improve quality of life. Buteyko's breathing technique has no side effects (Hassan, Riad & Ahmed, 2022). Research conducted by Prem, Sahoo & Adhikari (2023) showed that the group given the buteyko breathing technique showed an improvement in quality of life with 4 subdomains, namely symptoms, activity, emotions, environment and control against asthma attacks.

According to Cowie, Conley, Underwood & Reader (2022) buteyko breathing technique therapy can improve asthma control, reducing the use of inhaled corticosteroid therapy. No side effects were reported in the group given the buteyko breathing technique intervention. Based on the above background, it is important to conduct research on the effect of buteyko breathing techniques on ACT (asthma control test). Meanwhile, the purpose of the study was to determine the effect of buteyko breathing technique on ACT (asthma control test).

IMPLEMENTATION AND METHODS

This study uses a literature review research design to answer questions about the influence of the role of preceptorship guidance on the role of nurses in the work environment. The databases used include ScienceDirect, Mendeley, Google Scholar and ProQuest, with inclusion criteria for articles relevant to the topic of respiratory relaxation in broncial asthma patients, available in full text, using clear research methods, and in Indonesian or English and published in the range of 2020-2025. The keywords used for the Indonesian search are Respiratory Techniques, Bronchial Asthma, Respiratory Function Parameters

The results of the article search were obtained as a total of 85 articles, then the first stage was selected with the elimination of articles that were not in accordance with the topic as many as 30 articles. Furthermore, the second selection was carried out based on the relevance of the title and abstract totaling 25 and the remaining articles from the results of the title and abstract screening totaled 30. The articles reviewed totaled 30. After a full review of the content of the article, 10 journals were obtained that were used as the main reference in this study. The search results are presented in the PRISMA flowchart to describe the article selection process systematically (Page, M. 2021).

The literature review method is generally described. Nevertheless, the methodology lacks sufficient detail regarding search strategy, database keywords, article quality assessment, and inclusion/exclusion procedures. The article selection process is presented through a PRISMA flowchart. However, inconsistencies exist in the reported number of articles screened, reviewed, and included. These figures should be rechecked for accuracy.

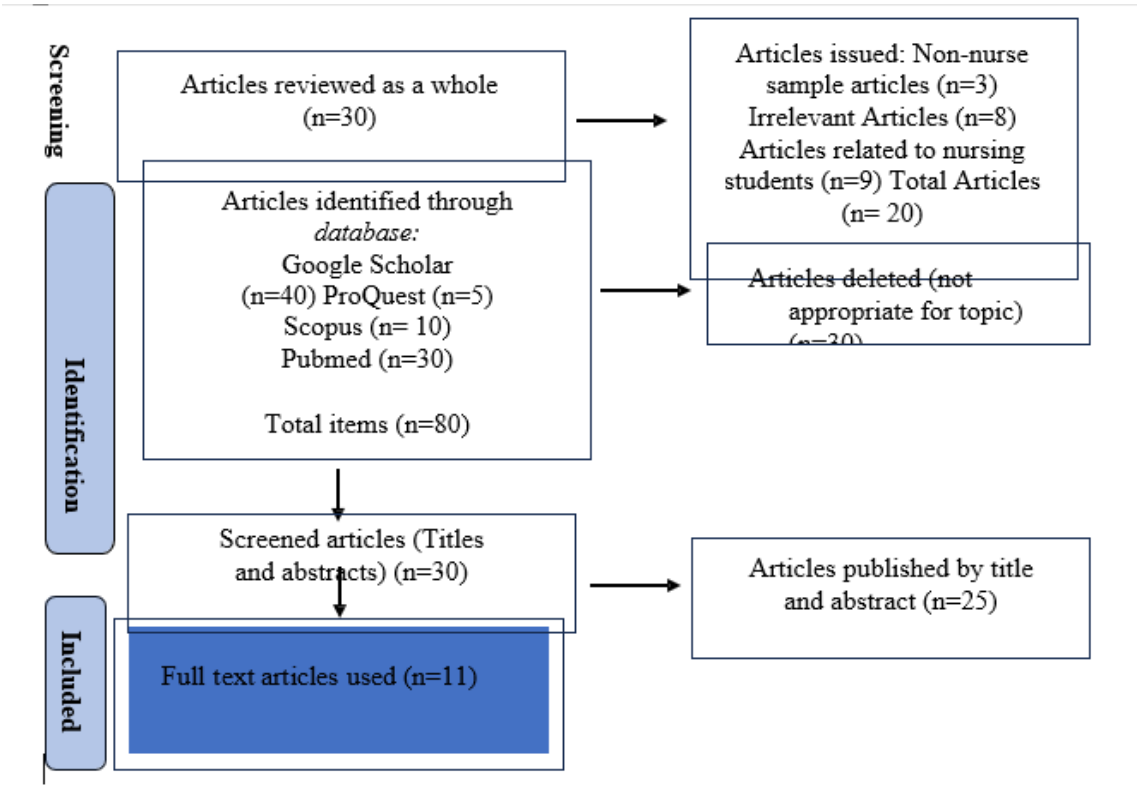

Figure 1. Flowchart

RESULTS AND DISCUSSION

Based on the search that has been carried out through several online databases and studied as a whole, it resulted in 30 journals, but only 11 journals were analyzed further because they had a special discussion topic regarding the effect of the application of edurebusu technique on respiratory function parameters in bronchial asthma patients. The journals that are further analyzed can be seen in table 1 below:

Table 1. Related Journals

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
1.	L'uboš Grznár 1,*, Dávid Suchá˘n 1, Jana Labudová 1, Lukáš Odráška 2 and Ivan Matúš (2024)	MDPI Applicead Science	Influences of Breathing Exercises and Breathing Exercise Combined with Aerobic Exercise on Changes in Basic Spirometry Parameters in Patients with Bronchial Asthma	Significant differences between EX1 and EX2 were observed at PEF ($p < 0.05$). Conclusion: It appears that the combination of breathing exercises with aerobic activity is a more beneficial option for patients with bronchial asthma.
2.	Elsa Devina Seftiani1, Agisni Fatihaturrohmah2, Nadia Mawaddah3, Septiyani Ayusita Aprilia4, Faiza Zahra Amelia5, Popi Sopiah (2025)	Indonesian Journal of Medical and Health Sciences	The Effectiveness of Deep Breathing Relaxation Techniques on Reducing Shortness of Breath in Asthma Patients: Narrative Literature	The results of this study show that deep breathing techniques can increase oxygen saturation, reduce breathing frequency, and improve lung ventilation. This approach also contributes to reducing symptoms and improving asthma control, so that it can be used as an additional therapy that is safe and easy to apply. However, variations in the study design, number of respondents, and duration of interventions are

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
				challenges that need to be addressed. Further research with stronger methods and standardized guidelines is needed so that these techniques can be properly integrated in asthma management.
3.	Dian Fitri Febriana1, Sri Hartutik2, Panggah Widodo (2024)	Journal of Imliah Health Sciences	Application of Diaphragmatic Breathing Exercise Technique to Changes in Respiratory Rate in Asthma Patients in Jebres Village	Using a descriptive method, the number of respondents was 2 people who had asthma, and the implementation was using the diaphragmatic breathing exercise technique. RR in both respondents before being given the application included the fast category, RR in both respondents after being given the application included in the normal category. The development of RR in both respondents before being given application was included in the category of rapid breathing and after being given application was included in the category of normal breathing.

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
4.	Theresia Isma Yovita1*, Yuliani Pitang (2025)	OVUM : Journal of Midwifery and Health Sciences	Intervention on the Application of Buteyko Technique to Stabilize Respiratory Rate in Mr. Ay Patient with Diagnosis of Bronchial Asthma Severe Degree of Excesses in the ICU Room of Dr.Tc.Hillers Maumere Hospital	The author's writing method uses a descriptive method with a case study approach. The case study was carried out on 07 – 09 January 2025 The buteyko technique was carried out for 3 days for 10 – 15 minutes. Study results: Buteyko therapy performed on Mr. A.Y has an effect on reducing the frequency of breathing. The conclusion of the implementation results carried out on Mr. A.Y obtained results that buteyko therapy can affect the frequency of breathing in asthma patients
5.	Iftitah Rahmawati Syafriningrum1*, Nanang Heru Sumarsono (2022)	FhisioaHs	Effectiveness of Active Cycle of Breathing Technique (ACBT) Exercise Therapy in Bronchial Asthma: A Case Study	Nonpharmacological management in asthma patients is the administration of Active Cycle of Breathing Technique (ACBT) consisting of Breathing Control (BC), Thoracic Expansion Exercise (TEE), and Forced Expiration Technique (FET). After being given 3 times of therapy, ACBT exercise therapy was effective in reducing symptoms in

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
				bronchial asthma patients.
6.	Veni Laily Dwi Fauziah (2024)	An-Najat : Journal of Pharmaceutical and Health Sciences	The Effect of Nebulizer Therapy and Buteyko Breathing Techniques on Dyspnea in Asthma Patients in the Emergency Room of PKU Muhammadiyah Yogyakarta	Respiration rate measurements were carried out after nebulizer therapy and buteyko breathing techniques. The previous breathing rate was 24x/minute, to 21x/min after nebulizer therapy, and 19x/min after the patient performed the buteyko breathing technique. Oxygen saturation was initially 95% to 98% after nebulizer therapy, then oxygen saturation became 100% after performing the buteyko breathing technique. The wheezing sound is still there but not as clear as when the patient was first admitted. Decreased respiratory rate, increased oxygen saturation and decreased wheezing sound when the patient was given nebulizer therapy and buteyko breathing techniques. Keywords: Asthma, Nebulizer Therapy, Te

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
7.	Yuvita Dwi Rahmasari1), By Wayan D. (2024)	Journal of Applied Nursing,	The Effect of Diaphragmatic Breathing Exercise on Changes in Respiratory Rate in Asthma Patients in the Internal Room II of Dr. R. Soedarsono Hospital, Pasuruan City	This study used an analysis of differences in the Paired T-Test test which showed a decrease in respiratory rate, as evidenced by the treatment group's p value of 0.00 < 0.05. Furthermore, the results of the Independent T-Test showed that there was no difference between the treatment and control groups, but clinically there was an effect of diaphragmatic breathing exercise on the reduction of respiratory rate in the treatment group of 3.571 x/minute greater than the control group of 2.714 x/min. Diaphragmatic Breathing Exercise therapy is expected to be an alternative therapy to reduce tightness in asthma patients.
8.	Indra Prana Jaya (2024)	Indonesian Journal Of Health Service	Effect of Diaphragmatic Breathing Exercise on Respiratory Rate and Oxygen Saturation in patients with Bronchial Asthma	This study showed that the Resporatory rate showed an average pretest of 24.95 (SD= 1,649), posttest of 17.54 (SD=1,789), and there was a significant difference in the Resporatory rate after

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
				being given Diaphragmatic Breathing Exercise therapy intervention (p=0.000). Oxygen saturation showed an average pretest of 98.62 (SD= 0.681), posttest of 96.16 (SD=1.068), and there was a significant difference in oxygen saturation after being given Diaphragmatic Breathing Exercise therapy intervention (p=0.000). Conclusion: The application of Diaphragmatic Breathing Exercise therapy can significantly reduce respiratory rate and increase oxygen saturation and can improve the efficiency of internal oxygen ventilation in post patients with bronchial asthma. Advice for nurses in providing care to patients with bronchial asthma by educating Diaphragmatic Breathing Exercise therapy to lower respiratory rate and increase oxygen saturation and also as a holistic approach in meeting basic needs

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
				for patients
9.	Feris Saraswati (2024)	Jurnal Opened	Nursing Care for Bronchial Asthma Patients with Buteyko Respiratory Engineering Innovation Intervention to Improve Ineffective Breathing Patterns in the Emergency Installation of Dr. Soebandi Jember Hospital	In patients before the buteyko breathing technique was performed, the results were obtained that the frequency of breathing increased, dyspnea increased, the use of auxiliary muscles increased. After performing the buteyko breathing technique, the results were obtained that the frequency of breathing decreased quite a bit dyspnea was quite decreasing, the use of auxiliary muscles was quite decreasing
10.	ARIYANTI (2023)	Jurnal Opened	The Application of Buteyko Breathing Techniques to Improve Breathing Patterns in Family Members Who Have Breathing Problems Is Ineffective with the Diagnosis of Bronchial Asthma in the Working Area of the Islamic Boarding School	The results of the study showed that there was a difference in the frequency of the respondents' breathing patterns between before and after buteyko breathing technique therapy, this buteyko breathing technique can improve ineffective breathing patterns in bronchial asthma patients. Recommendations need consistency in the application of

No.	Researcher, Year of Publication	Journal Name	Research Title	Research Results
			Health Center 1 (Case Study)	buteyko breathing techniques to reduce ineffective breathing patterns in people with bronchial asthma
11.	Marlin Sutrisna1, Emmy H Pranggono2, Titis Kurniawan (2025)	Silampari Nursing Journal	The Effect of Buteyko's Breathing Technique on the Act (Asthma Control Test)	The collected data were analyzed descriptively and inferentially with a significance scale of $p<0.05$. The results showed a significantly higher average difference between ACT scores after being given buteyko breathing techniques (19.79±1.47) and ACT scores at week III (17.50±1.78), week II (12.64±1.82), week I (9.57±1.95), and pretest (7.64±1.82). Post hoc analysis found that the post test scores of week four (19.79±1.47) were significantly better than post test weeks III (17.50±1.78), week II (12.64±1.82), week I (9.57±1.95), and pre-test (7.64±1.82) in improving asthma control. In conclusion, there is an effect of buteyko breathing technique on ACT (asthma control test).

Based on the analysis of the ten articles that have been reviewed, the authors found that the variables related to the application of breathing techniques with EDUREBUSU to the parameters of respiratory function in bronchial asthma patients. EDUREBUSU means Education, Relaxation, Buteyco and Suas. The advantages of buteyko breathing techniques can reduce the frequency of asthma attacks (recurrences), prevent severity, and lower the dose of inhaled corticosteroids as well as improve PEFR. In addition, buteyko breathing techniques can stop coughing, nasal congestion, shortness of breath, wheezing, and improve quality of life. Buteyko's breathing technique has no side effects (Hassan, Riad & Ahmed, 2022). Research conducted by Prem, Sahoo & Adhikari (2023) showed that the group given the buteyko breathing technique showed an improvement in quality of life with 4 subdomains, namely symptoms, activity, emotions, environment and control against asthma attacks.

The patient's breathing pattern before the intervention was obtained, the patient's breathing rate was 24x/minute, oxygen saturation was 95%, there was an additional breath sound in the form of wheezing, sputum could not come out. The inflammation that occurs in asthma sufferers is caused by excessive narrowing of the airway so that there will be wheezing, shortness of breath, chest pain and intensive coughing (Afgani, A. Q., & Hendriani, R., 2020). Nasal congestion, difficulty sleeping is also among the most common asthma symptoms that occur frequently, followed by wheezing and shortness of breath mixed with various symptoms e.g., wheezing, shortness of breath, chest tightness, cough (He, Z., Feng, J., Xia, J., Wu & Yang, H., Ma, 2020).

Asthma is divided into several types depending on the cause of its appearance. Allergic/extrinsic asthma is a type of asthma caused by allergens such as pet dander, dust, pollen, and food. This allergic reaction often occurs in certain conditions and seasons. This type of asthma usually begins in childhood. Environmental factors that are not directly related to idiopathic or non-allergic/spontaneous asthma, such as colds/flu, upper respiratory tract infections, activity, mood/stress, can also cause exacerbations. The attacks can become more severe and develop into emphysema. This type of asthma begins in adulthood (over 35 years old). The most common cause of asthma is mixed asthma. This type of asthma is a combination of allergic asthma and idiopathic asthma (Konstatia, R., 2023).

Buteyko's breathing technique has more benefits by improving pause control, which can reduce hyperventilation in people with asthma, thereby lowering the frequency of breathing. Studies show that buteyko breathing techniques can improve quality of life by reducing asthma, hyperventilation, and anxiety symptoms (Santino et al., 2020). A study (Kusuma et al., 2019) found that buteyko breathing techniques were effective in reducing the breathing frequency of asthma patients in the emergency room; The breathing rate before therapy is 28-36 times per minute, and after therapy it becomes 24-29 times per minute.

Firmansyah, A., Nurwahidah, S., Hamdani, D., Fitriani, A., Gunawan (2023) explained that other management of asthma can be given non-pharmacological treatments, including avoiding asthma triggers, health education, chest exercises, drinking warm water and coughing effectively. In addition, deep breathing techniques, positioning adjustment, stretching of the respiratory muscles, buteyko breathing techniques, and guided imagery therapy can be given to relieve shortness of breath (Husain, F., Purnamasari et al., 2020). The results of this study are in accordance with research carried out at the emergency room of dr. Soeradji Tirtonegoro Hospital with a sample of 10 patients where there was a decrease in the respiratory frequency of asthma patients (Putri, D. K. A., Beti, K., Tofik, 2019).

The patient's breathing rate ranged from 28-36 x/min to 24-29 x/min. The study stated that buteyko breathing techniques are useful for improving abdominal breathing, reducing asthma symptoms and improving the quality of life of asthma sufferers. Buteyko's breathing technique is effective in asthma sufferers because of the increase in the patient's respiratory condition. The goal of Buteyko's breathing technique is to slowly realign or rehabit the respiratory center with higher CO2 values and a reduction in minute ventilation (David, J. J., Harshada, 2022). Putri (2019) research found that 60 buteyko breathing techniques resulted in a significant increase in the patient's breathing frequency. Research by Baroroh (2019) found that buteyko breathing exercises reduced the frequency of asthma recurrences in patients. In addition, the study of Yuniartanti (2019), who performed nursing measures with buteyko breathing exercises during one meeting three times with a time gap of 60 minutes, found that there was an increase in pause control from 5 seconds to 10 seconds. The reviewed articles consistently report positive effects on respiratory rate, oxygen saturation, and asthma control. However, the manuscript does not provide a critical comparison of findings or discuss variations among studies.

CONCLUSIONS AND RECOMMENDATIONS

Based on the discussion that has been presented, it is recommended that health service institutions further optimize the implementation of the EDUREBUSU technique through increasing training for nurses, preparing systematic guidance guidelines, making SOPs and providing continuous organizational support. In addition, it is important for hospital management to conduct a routine evaluation of the effectiveness of the implementation of the EDUREBUSU technique in hospitals applied to Broncial Asthma patients

The researcher is further expected to delve deeper into the factors that affect the successful implementation of the EDUREBUSU technique, the creation of clear Standard Operating Procedures and applied by all nurses. Thus, the implementation of the EDUREBUSU technique application program in hospitals can be more effective in improving the quality of nursing practices and overall patient safety.

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