



Efficacy of Relaxation Therapy on the Breathing Pattern among Bronchial Asthma Patients

Roshani P. Dhanvijay^{1*} and Savita Pohekar¹

¹Department of Medical Surgical Nursing, Shrimati Radhikabai Meghe Memorial College of Nursing, Datta Meghe Institute of Medical Sciences, Sawangi (M), Wardha, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i42B32424

Editor(s):

(1) Dr. Takashi Ikeno, National Center of Neurology and Psychiatry, Japan.

Reviewers:

(1) Mario Ribeiro Alves, Federal University of Mato Grosso, Brazil.

(2) Semih Yaşar, Van Yuzuncu Yil University, Turkey.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/72352>

Study Protocol

Received 01 June 2021

Accepted 04 August 2021

Published 31 August 2021

ABSTRACT

Background: Bronchial asthma (BA) is a chronic disease characterized by inflammation of the airway that triggers frequent cough, wheezing, dyspnea, and chest tightness. Bronchial asthma may be caused by exposure to multiple irritants and pollutants which include: pollen, dust mites, mold spores, pet dander, smoke, respiratory allergens. Treatment for bronchial asthma patients along with the medication for relieving the symptoms of asthma. Various alternative therapies alleviating the rate of wheezing, aiming to minimize asthma triggers.

Aim: The study aim is to assess the effectiveness of selected relaxation technique on the breathing outcome among patients diagnosed with bronchial asthma.

Methodology: It is an interventional evaluatory approach; time-series design will be used to conduct the bronchial asthma patients. A Non-Probability purposive sampling technique will be used to select the samples. This research study included 40 patients of AVBRH Rural hospital Sawangi (M) Wardha. Patients must select according to requirements for inclusion and exclusion criteria. The pretest-posttest will be taken with the assessment of peak expiratory flow rate, breath-holding time, and frequency of using the inhaler. After that, statistical and inferential analysis will be done.

Expected Results: Outcome includes the selected relaxation technique on the bronchial asthma patients that are effective for relieving the symptoms and frequency of medication. Both relaxation

*Corresponding author: E-mail: roshnidhanvijay19@gmail.com;

method which is most effective for the bronchial asthma patients that are going to assess with the sample.

Conclusion: The conclusion will be drawn from the statistical analysis.

Keywords: Effectiveness; relaxation technique; bronchial asthma; breathing outcome; buteyko breathing exercise; pursed-lip breathing exercise.

1. INTRODUCTION

Bronchial asthma is a common chronic inflammatory disease that causing the bronchi to enlarge and narrow the airways, triggering respiratory problems from mild to life-threatening [1].

“Asthma is a chronic airway condition that brings air from and to the lungs. There is no complete cure, but a person with asthma can live a healthy and productive life through management techniques [2]. Asthma strengthens and narrows the airways. This is a (chronic) long-term challenge for bronchial asthma patients. The airways may be too tiny to present chronic inflammatory symptoms such as cough, dyspnea, and whistling noises, especially while breathing out, tiredness or a lack of energy. In some cases, the chronically mild inflammation of airways will contribute to permanent (continuous) scar tissue and lung damage [3].

Treatments used for asthma care can be divided into two main categories: normal long-term treatment drugs and fast-relief medications used to alleviate broncho-constriction immediately if needed. Quick-relief short-acting beta2 agonists, anticholinergics, and systemic corticosteroids are among the medications. People suffering from severe asthma require long-term and faster drug therapy [4].

Together with treatment the other alimentary treatment i.e. the Buteyko breathing and pursed-lip breathing. The Buteyko breathing exercise approach focuses on the rate and rhythm of respiration, helping to decrease and control the respiration rate [5].

The Buteyko method is neither a medical intervention nor an operation. It would not require any medicine, homeopathic remedies, or herbs. A number of seminars on breathing techniques that helping participants to know the idea of natural respiration' or breathing in keeping with physiological standards [6]. It includes simple breathing techniques and logical guidelines. It also provides the means

to evaluate breathing conditions without technical equipment. Buteyko Methodology allows the behavioral and physiological parameters of the body to the norm. It can quickly be adopted into some kind of contemporary person's everyday life. It should not need to pause your regular tasks to execute sophisticated processes similar to the 'asana' of yoga. In any case, the method can be used at any time [7].

Pursed lip breathing is also a simple technique to slow the breathing down and bring more oxygen into the lung. It will help the lungs improve and increase their performance through daily practice. The procedure requires breathing through the nose and breathing through the mouth gradually. Repeated pursed-lip breathing should slow down and drain the lung. Pursed lip breathing can be part of a rehabilitation program for the pulmonary system. It may help individuals with the pulmonary conditions, particularly chronic obstructive lung disease (COPD). Effective breathing pattern has many advantages for the individual. A sufficient amount of oxygen in the body can be used for normal schedule or daily activities including exercising, running, or walking the stairs. It can encourage a person to do more exercises or relieve stress, which can cause shortness of breath [8].

2. NEED OF THE STUDY

“Asthma is a chronic airway condition that transfers air to and from the lungs. There is no complete cure, but intervention mechanisms will help individuals with asthma live an active and healthy life” [9].

Historically, the incidence of asthma in India was already registered at around 3% (30 million patients), with an incidence of 2.4% in adults above 15 years of age [10].

Asthma is a debilitating illness with frequently attacks of shortness of breath and wheezing attacks. During an asthmatic episode, the lining of the bronchial airways tubes swells and restricts air flow in and out of the respiratory

system and hence the airways becomes narrow. In this way the airway becomes more susceptible to irritants in the atmosphere. The origins of asthma are not well understood [11]. The asthma clinical course is unpredictable, from adequate control to aggravation and inadequate symptom control [12].

India has an approximately 15-20 million asthmatics. The incidence is on the rise. It is estimated that the prevalence in 5-11 year old children is between 10% and 15%. Deaths from asthma account for 1.87% of total deaths in the country [13]. The aim of the exercises is to correcting the breathing pattern; improve the flexibility and/or endurance of the respiratory muscles; and increasing the flexibility of the thoracic cavity and improving posture. The majority of the study focuses on breathing retraining strategies, which presently have the greatest and most persuasive evidence base for efficacy in asthma and are the most extensively used [14]. Breathing training works to "normalize" respiratory patterns, often by adopting a slower respiratory rate with longer expiration and a decrease in overall ventilation [15].

Due to asthma people more likely to have complications from the flu, like pneumonia, and because of that the people become hospitalized. People may suffer various complications to managing asthma attacks [16]. Once the person gets diagnose the asthma, the health care provider will recommend the medication which includes the asthma inhalers and types of pills, and some modifying lifestyle changes to treat and prevents asthma attacks [17].

Optimal self-care is highly recommended in the prevention and management of asthma, with a combination of client education, self-monitoring, daily physician consultation, and self-management using a prescription treatment plan. Pulmonary rehabilitation therapy in asthmatics produces significant improvement in exercise capacity and improves asthma symptoms and quality of life [18].

3. OBJECTIVES

1. To assess the respiratory status of bronchial asthma patients.
2. To assess the effectiveness of buteyko breathing exercise on the breathing outcome among patients diagnosed with bronchial asthma.
3. To assess the effectiveness of pursed-lip breathing exercise on the breathing

outcome among patients diagnosed with bronchial asthma.

4. To compare the effectiveness of buteyko breathing exercise and pursed-lip breathing exercise on breathing outcome among bronchial asthma patients.
5. To associate the effectiveness of buteyko breathing exercise on the breathing outcome among bronchial asthma patients with selected demographic variables.
6. To associate the effectiveness of pursed-lip breathing exercise on the breathing outcome among bronchial asthma patients with selected demographic variables.

Methodology: It is an academic hospital based study. It will be conducted AVBRH Sawangi respectively.

4. SELECTION CRITERIA FOR SAMPLE

4.1 Inclusion Criteria

4.1.1 Inclusion Criteria

Bronchial asthma –

1. Patients in selected area who are willing to participate in the study.
2. Patients who are available at the time of data collection.
3. Patients who are able to understand and follow the instruction of exercise.
4. Patients receiving some medication for bronchial asthma.

4.1.2 Exclusion criteria

Bronchial asthma-

1. Patients who are terminally ill.
2. Patients who are impaired cognitive functions.
3. Patients who were suffering from severe exacerbation of asthma.
4. Patients those who were already doing buteyko breathing exercise and pursed lip breathing exercise.

4.1.3 Sample size

$$N = \frac{2\alpha/2^2 \cdot P(1-p)}{d^2}$$

$2\alpha/2^2$ – It is the level of significant at 5% i.e. 95% confidence interval = 1.96

P- Prevalence of patient bronchial asthma = 2.78% = 0.0278

D- Derived error of margin = 5% = 0.05

$$N = \frac{1.962 \times 0.0278 \times (1 - 0.0278)}{0.052}$$

N = 41.53

N = 40

4.2 Outcome Measures

Primary outcome: It includes the relaxation technique i.e. alternative therapy are effective for bronchial asthma patients.

Secondary outcome: It consists of the relaxation technique i.e. Buteyko breathing exercise as well as pursed-lip breathing exercise for bronchial asthma patients are more effective and minimizes the symptoms and reduces the frequency of medication.

4.3 Data Management and Monitoring

Data collection will be conducted for a single month span from November 2020 to December 2020. This research will be carried out after receiving authorization from the authorities concerned.

4.4 Tool for Data Collection

Section A – Demographic Variable: A piece of demographic information which gives baseline information obtained from patients such as age, gender, occupation, education, income, duration of illness with bronchial asthma, types of allergy, use of regular medication for bronchial asthma.

Section B – the pretest and posttest assessment of respiratory status with the variables like peak flow expiratory rate, breath-holding time, and frequency of using an inhaler.

4.5 Statistical Analysis

Descriptive method: Data have been evaluated using version 17.0 of the Statistical Program Social Science (SPSS). A student-paired t-test was used to analyze the statistical significance, with a $p < 0.05$ being approved.

5. RESULTS

In this present study, the output includes buteyko breathing exercise and pursed-lip breathing

exercise are using to bronchial asthma patients and more effective and minimizes the symptoms and reduces the frequency of medication.

6. DISCUSSION

The study was conducted to assess the effectiveness of relaxation technique on the breathing outcome among patients diagnosed with bronchial asthma it was aimed to improve the breathing outcome of patients with bronchial asthma.

The similar study was conducted by Honesty Diana Morika, et al. to figure out the effect of pursed-lip breathing exercise from May 1 to July 20, 2019, at the West Sumatra Lung Hospital. This research was performed in persons with obstructive pulmonary disease (COPD) with an experimental group of 16 and a control group of 16 respondents. The findings revealed the average reduction in breathlessness in the treatment group with the intervention of pursed lip breathing i.e. pretest 3.19 and posttest 1.69 [19].

A study conducted in Shri Guru Ram Rai Institute of Medical & Health Sciences, Patel Nagar, Dehradun, Uttarakhand 248001, India for to Compare the Effect of Buteyko Breathing Technique and Pursed Lip Breathing in COPD. The aim of the study is to compare the better Effectiveness of Buteyko Breathing Technique and Pursed Lip Breathing in Chronic Obstructive Pulmonary Disease. There are fifty (50) subjects clinically diagnosed of chronic obstructive pulmonary disease (COPD) are selected for this study. They were divided into two groups by simple random sampling. Group A performed Buteyko Breathing Exercise and Group B performed Pursed Lip Breathing Exercise. There pulmonary function test and dyspnoea grade were recorded before and after the exercises. The exercise protocol followed every day for 4 weeks.

Buteyko Berthing Technique (BBT) and Group B received Pursed Lip Breathing (PLB) and done for 4and exercise done 3 times in a day. Data was analyzed and the results concluded that the exercise assigned to both the groups was effective in showing significant reduction in both FEV1 and showing sign FVC and in the grade of dyspnoea [20].

Some other studies conducted on bronchial asthma patients to check the effectiveness

among exercises. G. shine was conducted a research among 30 bronchial asthma patients, both men, and women aged between 20 to 40 years, were assigned into two groups. Diaphragmatic breathing exercises were performed for patients included in group 1 and pursed-lip exercises were performed for patients included in Group 2. For six weeks, five days a week, twice a day for 20 minutes a session has been conducted, both the group's participants have obtained selected intervention. Pre and post-test samples were recorded by a peak expiratory flow meter and chest extension by an inch tape. Data from this study have been analyzed by using the software SPSS version 17.0. The analysis was conducted by using a student paired t-test. The findings of this analysis indicate that the diaphragmatic breathing group has significant improvement to the pursed-lip breathing group. In Group 1 the value of chest expansion improved by 2.04% and in Group 2 i.e. 1.01 %, whereas the peak expiratory flow rate (PFER) improved by 16.9% and in Group 2 by 2.27 %. The study found that diaphragm breathing practice plays an important role in asthmatic rehabilitation to improve and enhance the independence of patients [21].

7. CONCLUSION

This study conclude that the breathing exercises was cost effective, non invasive and highly feasible. It is one of the effective intervention on improving breathing pattern among bronchial asthma disease patients.

CONSENT AND ETHICAL APPROVAL

This study will approve by the Institutional Ethics Committee of DMIMS. All participants will be asked to read and sign the informed consent. Proper explanation about the purpose of the study and the nature of the adjustment scale involved in the study will be given to the samples. Information about the samples will handle properly so that confidentiality and anonymity will maintain. Information will not use or release outside the terms of the agreement.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Laza-Stanca V, Mallia P, Parker HL, Zhu J, Kebabdz T, Contoli M, et al. Rhinovirus-induced lower respiratory illness is increased in asthma and related to virus load and Th1/2 cytokine and IL-10 production. *Proceedings of the National Academy of Sciences*. 2008;105(36): 13562-13567.
2. Shakshuki A, Agu RU. Improving the efficiency of respiratory drug delivery: a review of current treatment trends and future strategies for asthma and chronic obstructive pulmonary disease. *Pulmonary Therapy*. 2017;3(2):267-281.
3. Fireman P. Symposium: Understanding Asthma Pathophysiology. In *Allergy & Asthma Proceedings* 2003;24(2).
4. Gross KM, Ponte CD. New strategies in the medical management of asthma. *American family physician*. 1998;58(1):89.
5. McHugh P, Aitcheson F, Duncan B, Houghton F. Buteyko Breathing Technique for asthma: an effective intervention. *Journal of the New zealand medical association*. 2003;116(1187).
6. Navarra T. *The Encyclopedia of Complementary and Alternative Medicine*. Tova Navarra; 2004.
7. Kenner A. *Breathtaking: Asthma care in a time of climate change*. U of Minnesota Press; 2018.
8. Garrod R, Mathieson T. Pursed lips breathing: Are we closer to understanding who might benefit; 2013.
9. Shakshuki A, Agu RU. Improving the efficiency of respiratory drug delivery: a review of current treatment trends and future strategies for asthma and chronic obstructive pulmonary disease. *Pulmonary Therapy*. 2017;3(2):267-281.
10. Gupta PR, Mangal DK. Prevalence and risk factors for bronchial asthma in adults in Jaipur district of Rajasthan (India). *Lung India*. 2006;23(2):53.
11. Abdurrasyid S, Ft M, Wismanto SF, Effectiveness of Buteyko Breathing Technique and Pursed Lip Breathing Technique in Improving Peak Expiratory Flow Rate in Patients With Asthma; 2006.
12. Blake K, Raissy H. Asthma Guidelines from the National Asthma Education and Prevention Program: Where Are We Now? *Pediatric Allergy, Immunology, and Pulmonology*. 2018; 31(1):37-39.
13. Zhang W, Chen X, Ma L, Wu J, Zhao L, Kuang H, et al. Epidemiology of bronchial asthma and asthma control assessment in

- Henan Province, China. Translational respiratory medicine. 2014;2(1):1-7.
14. Thomas M, Bruton A. Breathing exercises for asthma. *Breathe*. 2014;10(4): 312-322.
 15. Tehrani R, DeVos R, Bruton A. Breathing pattern recordings using respiratory inductive plethysmography, before and after a physiotherapy breathing retraining program for asthma: A Case Report. *Physiotherapy theory and practice*. 2018;34(4):329-335.
 16. Holtz C. ed, *Global health care: Issues and policies*. Jones & Bartlett Publishers; 2013.
 17. Bateman ED, Hurd SS, Barnes PJ, Bousquet J, Drazen JM, FitzGerald M, Gibson P, Ohta K, et al. Global strategy for asthma management and prevention: GINA executive summary. *European Respiratory Journal*. 2008;31(1):143-178.
 18. Agarwal R, Dhooria S, Aggarwal AN, Maturu VN, Sehgal IS, Muthu V, et al. Guidelines for diagnosis and management of bronchial asthma: Joint ICS/NCCP (I) recommendations. *Lung India: official organ of Indian Chest Society*. 2013; 32(Suppl 1):S3.
 19. Morika HD, Sari IK, Sandra R, Arman E, The effect of pursed lip breathing exercise against decrease of breathing levels in chronic obstruction pulmonary disease; 2019.
 20. Sakhaei S, Sadagheyani HE, Zinalpoor S, Markani AK, Motaarefi H. The impact of pursed-lips breathing maneuver on cardiac, respiratory, and oxygenation parameters in COPD patients. *Open access Macedonian journal of medical sciences*. 2018;6(10):1851.
 21. Shine G, Saad S, Nusaibat S, Shaik AR, Padmakumar S. Comparison of effectiveness of diaphragmatic breathing and pursedlip expiration exercises in improving the forced expiratory flow rate and chest expansion in patients with bronchial asthma. *Int J Physiother*. 2016;154-8.

© 2021 Dhanvijay and Pohekar; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<https://www.sdiarticle4.com/review-history/72352>