

# IMPACT OF PRANAYAM ON RESPIRATORY PARAMETERS AMONG PATIENTS WITH BRONCHIAL ASTHMA :A PILOT STUDY

Ms. Jerusaben Gohil<sup>1\*</sup>, Dr. Ramachandra S Hooli<sup>2</sup>

<sup>1</sup>. Ph.D. scholar, Parul Institute of Nursing, Parul University, Waghodia, Vadodara, Gujarat.

<sup>2</sup>. Faculty of Nursing, Parul Institute of Nursing, Parul University, Waghodia, Vadodara, Gujarat.

\*Corresponding Authors: Ms. Jerusaben Gohil

## ABSTRACT

Pranayama is a controlled breathing technique rooted in ancient yogic practices aimed at regulating physical and mental well-being. Improving respiratory efficiency and maintaining autonomic nervous system balance require deliberate control over inhalation, exhalation, and retention. Wheezing, dyspnea, and hyperresponsiveness of the airways are the hallmarks of asthma, a chronic inflammatory disease of the airways.

**Aim of the study** was to assess the effectiveness of pranayama on respiratory parameters among patients with bronchial asthma

**Methodology-** A quantitative research approach was adopted for the study. The research design selected was a Quasi experimental Non—equivalent control group pre-test post-test design to determine the effect of pranayama intervention. The study was carried out in ESIC BAPUNAGAR Ahmedabad, Gujarat. The target population consisted of patients diagnosed with bronchial asthma who were attending the outpatient or inpatient departments of the selected hospital. A sample of patients meeting the inclusion criteria was selected using a non-probability purposive sampling technique. The collected data were organized and analyzed using descriptive and inferential statistics. Mean, standard deviation, and frequency distribution were used to describe the findings. The effectiveness of pranayama was determined by comparing pre-test and post-test scores using appropriate statistical tests.

**Result-** The study findings revealed that the experimental group who practiced pranayama showed significant improvement in respiratory parameters including FVC, FEV1, and FEV1/FVC ratio compared to the control group. The mean difference was higher in the experimental group, and the unpaired t-test indicated statistical significance at  $p < 0.05$ . The control group showed minimal or no improvement.

**Conclusion-** The study concludes that pranayama is an effective non-pharmacological intervention for improving respiratory parameters among patients with bronchial asthma. Regular practice of pranayama significantly enhances lung function and can be incorporated as a complementary therapy in asthma management.

**KEYWORDS-** Assess, Effectiveness, Pranayama, Respiratory parameters, Bronchial asthma

## INTRODUCTION

Asthma is a disorder of airflow obstruction in which the patient presents with symptoms of wheezing and dyspnea. Currently, the global prevalence of asthma is around 300 million, which includes 10–12% of adults and 15% of the pediatric population (**Global Initiative for Asthma 2023**). Global Bronchial Initiative for Asthma (GINA) program was initiated in 1989 to create awareness among the public and health care workers regarding the rising trend of asthma (**World Health Organization 2023**). The aim of the GINA program was to provide effective methods of management for asthma. With urbanization and the adoption of modern lifestyles, the rate of bronchial asthma has increased in recent decades, with a projected increase from 45% to 59% in the year 2025. (**World Health Organization 2023**) Bronchial asthma, in addition to deranged pulmonary functions, is also associated with autonomic imbalance (**Joshi, L. N., et al. 1992**). Studies have shown increased sympathetic and reduced parasympathetic functions in patients with uncontrolled bronchial asthma (**Sodhi, C., Singh, S., & Dandona, P. K. 2009**). Chronic obstructive pulmonary disease (COPD) is characterized by irreversible airflow obstruction, a gradual decline in lung function, loss of lung tissue, reduced quality of life, and high rates of mortality. Prolonged use of pharmacological agents can cause increased morbidity and financial burden for patients, especially in developing countries like India (**Singh, S., et al. 2012**). This can be overcome by non-pharmacological alternative modalities like yoga and pranayama techniques. Studies in the past have shown the beneficial effects of various asanas and breathing exercises on bronchial asthma. Recent evidence-based clinical practice guidelines and statements have shown that pulmonary rehabilitation is widely accepted as the most effective non-pharmacotherapy in the management of COPD (**Nagarathna, R., & Nagendra, H. R. 1985**). Despite the benefits of physical activity and the existence of national recommendations, the majority of patients remain insufficiently active. The well-known principles of yoga

are relaxation, exercise (asanas), pranayama (breathing control), a nourishing diet, and positive thinking and meditation. Pranayama, a yogic breathing practice, increases lung capacity. Life expectancy is likely to increase if breathing is slowed, deep, and relaxed. Airway resistance is also decreased in asthma subjects when the autonomic tone is manipulated by these techniques, probably due to an increase in parasympathetic tone. (Karpagam, K. K., et.al. 2025)

### NEED FOR THE STUDY

Bronchial asthma is a chronic inflammatory disorder of the airways characterized by recurrent episodes of wheezing, breathlessness, chest tightness, and cough. The global prevalence of asthma has been steadily increasing, leading to significant morbidity, reduced quality of life, and economic burden on individuals and healthcare systems. (Karpagam, K. et.al. 2025) Although pharmacological management, including bronchodilators and corticosteroids, plays a central role in controlling symptoms, long-term dependence on medications may result in side effects, financial strain, and inconsistent symptom control. Non-pharmacological interventions such as pranayama (yogic breathing techniques) have gained attention as complementary therapies in respiratory disorders. Pranayama focuses on controlled breathing, regulation of airflow, and improvement of lung capacity, which may positively influence respiratory parameters and reduce the severity of symptoms. While previous studies suggest beneficial effects of yogic practices in chronic diseases, evidence specifically assessing the structured use of pranayama among bronchial asthma patients in hospital settings remains limited. Considering the rising incidence of asthma and the need for cost-effective, supportive management strategies, it is essential to scientifically evaluate the effectiveness of pranayama. Therefore, this study aims to assess the impact of pranayama on respiratory parameters among patients with bronchial asthma.

### AIM OF THE STUDY

Aim of the study was to assess the effectiveness of pranayama on respiratory parameters among patients with bronchial asthma.

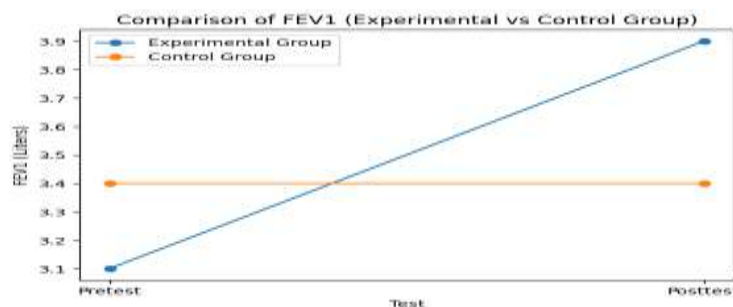
### RESEARCH METHODOLOGY

The present study was conducted to assess the respiratory parameters among patients with bronchial asthma and to evaluate the effectiveness of pranayama on selected respiratory parameters. A quantitative research approach was adopted for the study. The research design selected was a Quasi experimental Non equivalent control group pre-test and post-test design to determine the effect of pranayama intervention. The study was carried out IN ESIC BAPUNAGAR , Ahmedabad, Gujarat. The target population consisted of patients diagnosed with bronchial asthma who were attending the outpatient or inpatient departments of the selected hospital. A sample of patients meeting the inclusion criteria was selected using a non-probability purposive sampling technique. Patients who were medically stable, willing to participate, and able to perform breathing exercises were included in the study. Patients with severe complications or other chronic respiratory disorders were excluded. Data collection was done in two phases. In the first phase, baseline data regarding demographic variables and clinical characteristics were collected using a structured questionnaire. Respiratory parameters such as respiratory parameters including FVC, FEV1, and FEV1/FVC were assessed using standardized instruments. In the second phase, pranayama was administered as an intervention. The selected pranayama techniques included NADI SODHANA KAPALBHATI AND BHASTRIKA The intervention was conducted for a specified duration daily under supervision for a predetermined period. Participants were guided and monitored to ensure correct performance of techniques. After completion of the intervention period, post-test assessment of respiratory parameters was carried out using the same tools as in the pre-test. The collected data were organized and analyzed using descriptive and inferential statistics. Mean, standard deviation, and frequency distribution were used to describe the findings. The effectiveness of pranayama was determined by comparing pre-test and post-test scores using appropriate statistical tests. Ethical approval was obtained from the concerned authority, and informed consent was taken from all participants prior to data collection. Confidentiality and anonymity of the participants were strictly maintained throughout the study.

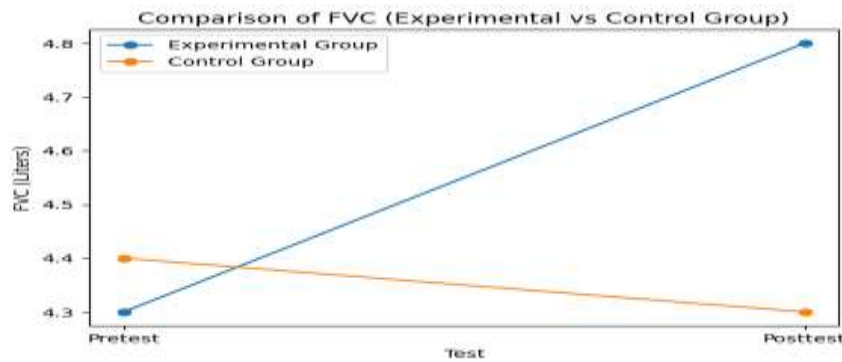
### RESULT

**SECTION 1:** To assess the respiratory parameters among patients with bronchial asthma

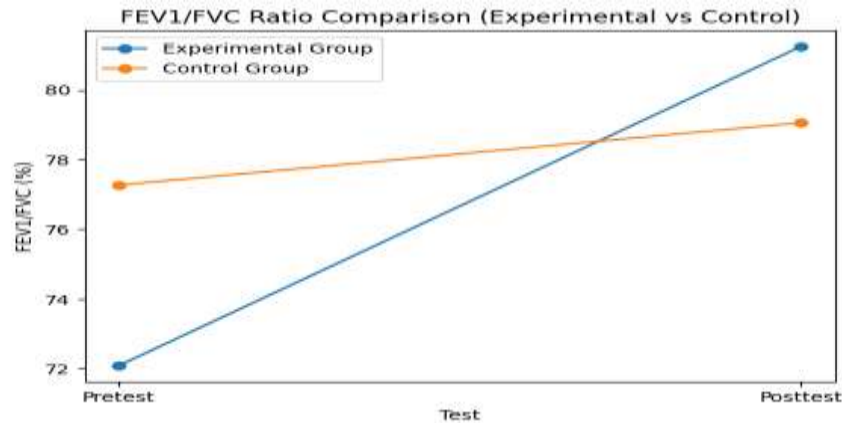
**FIGURE-1**



**FIGURE-2**



**FIGURE-3**



**TABLE NO-1**

GROUP	PARAMETER	MEAN PRETEST VALUE (L)	MEAN POSTTEST VALUE (L)	SD
	FVC	4.3	4.8	$\pm 0.75$
<b>EXPERIMENTAL GROUP (N = 10)</b>	FEV1	3.1	3.9	$\pm 0.63$
	FEV1/ FVC	72.09	81.25	$\pm 9.16$
	FVC	4.4	4.3	$\pm 0.1$
<b>CONTROL GROUP (N = 10)</b>	FEV1	3.4	3.4	$\pm 0.2$
	FEV1/FVC	77.27	79.06	$\pm 3.6$

The study findings in Table 2 revealed a noticeable improvement in respiratory parameters among patients in the experimental group who practiced pranayama, compared to the control group. In the experimental group (n = 10), the mean Forced Vital Capacity (FVC) increased from 4.3 L in the pre-test to 4.8 L in the post-test, with a standard deviation of  $\pm 0.75$ , indicating improvement in lung capacity. The mean Forced Expiratory Volume in one second (FEV1) improved from 3.1 L to 3.9 L, with a standard deviation of  $\pm 0.63$ , showing enhanced expiratory airflow. Additionally, the FEV1/FVC ratio increased from 72.09% to 81.25%, with a difference of  $\pm 9.16$ , reflecting significant improvement in airway function and reduced obstruction. In contrast, the control group (n = 10) showed minimal or no significant change. The mean FVC slightly decreased from 4.4 L to 4.3 L ( $\pm 0.1$ ). The mean FEV1 remained unchanged at 3.4 L ( $\pm 0.2$ ). The FEV1/FVC ratio showed only a slight increase from 77.27% to 79.06% ( $\pm 3.6$ ), which was comparatively less than the experimental group. The comparison of pre-test and post-test values between both groups indicates that pranayama had a positive effect on improving respiratory parameters among patients with bronchial asthma. The experimental group demonstrated greater improvement in lung function and airway efficiency compared to the control group, supporting the effectiveness of pranayama as a complementary therapy in asthma management.

**SECTION 2:** To evaluate the effectiveness of pranayama on respiratory parameters & symptoms among patients with bronchial asthma.

**Table 2: Effectiveness of Pranayama on Respiratory Parameters (Unpaired t-test)**

Variable	Group	N	Mean Difference	SD	t value	df	Significance (p < 0.05)
<b>FVC</b>	Experimental	10	0.80	0.75	0.94	8	Significant
	Control	10	0.12	0.10			
<b>FEV1</b>	Experimental	10	0.87	0.63	1.54	8	Significant
	Control	10	0.24	0.20			
<b>FEV1/FVC</b>	Experimental	10	10.57	9.16	0.72	8	Significant
	Control	10	4.31	3.60			

The above Table 2 shows the comparison of mean differences in respiratory parameters between the experimental and control groups using the unpaired t-test. For **FVC**, the experimental group showed a higher mean improvement (0.80 L) compared to the control group (0.12 L). For **FEV1**, the experimental group demonstrated greater improvement (0.87 L) than the control group (0.24 L). For **FEV1/FVC ratio**, the experimental group showed marked improvement (10.57%) compared to the control group (4.31%). The obtained t-values indicate statistical significance at the  $p < 0.05$  level. Hence, the findings reveal that pranayama was effective in improving respiratory parameters among patients with bronchial asthma.

## DISCUSSION

The present study showed that pranayama improved respiratory parameters among patients with bronchial asthma, as the experimental group demonstrated better post-test improvement in FVC, FEV1, and FEV1/FVC ratio than the control group. This finding is comparable with **Turan and Tan (2020)**, who reported that yoga positively improved respiratory functions, symptom control, and quality of life in asthma patients. It is also partly supported by **Yüce and Taşçı (2020)**, who found that pranayama improved asthma control and quality of life, although the change in pulmonary function tests was not statistically significant in their trial. This suggests that pranayama may consistently improve clinical outcomes, while the degree of spirometric improvement may vary across studies.

The present findings are further supported by more recent evidence. **Andreasson et al. (2022)**, in a multicenter randomized clinical trial, found that breathing exercises used in addition to usual asthma care improved asthma-related quality of life in patients receiving specialist care. Although that study was not limited to pranayama alone, it supports the role of structured breathing interventions as useful adjunctive therapy. In addition, **Singh et al. (2023)**, in a meta-analysis, concluded that yoga has a favorable effect on pulmonary function in patients with asthma and provides moderate evidence for its complementary benefit in mild-to-moderate disease. These findings strengthen the interpretation that the respiratory gains observed in the present study are scientifically consistent with current literature.

More recently, **Yadav et al. (2024)** reported in a randomized controlled trial that adjuvant yoga therapy reduced exacerbations and improved asthma control when combined with routine medical care. Likewise, the Cochrane review by **Santino et al. (2020)** concluded that breathing exercises may improve quality of life, hyperventilation symptoms, and lung function in adults with asthma<sup>14</sup>. Therefore, the present study supports current evidence that pranayama is a safe, low-cost, and effective complementary intervention for improving respiratory outcomes in bronchial asthma.

## CONCLUSION

The present study was undertaken to assess the effectiveness of pranayama on respiratory parameters among patients with bronchial asthma. The findings of the study clearly indicate that pranayama has a positive and statistically significant impact on pulmonary function. The experimental group demonstrated marked improvement in Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1), and FEV1/FVC ratio when compared to the control group. The mean difference values were considerably higher in the experimental group, indicating enhanced lung capacity, improved expiratory airflow, and reduced airway obstruction following the practice of pranayama. In contrast, the control group showed only minimal or negligible changes in respiratory parameters. The statistical analysis using the unpaired t-test confirmed that the improvements observed in the experimental group were significant at the  $p < 0.05$  level. These findings support the effectiveness of pranayama as a complementary, non-pharmacological intervention in the management of bronchial asthma. Pranayama, being simple, cost-effective, and easy to practice,

can be incorporated into routine asthma care to improve respiratory efficiency and overall quality of life. Therefore, it can be concluded that regular practice of pranayama significantly enhances respiratory parameters and serves as an effective supportive therapy for patients with bronchial asthma.

**Conflict of Interest:** The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

**Funding Source:** There is no funding Source for this study

## REFERENCES

1. Anshu, Singh, N., Deka, S., Saraswati, P., Sindhwani, G., Goel, A., et al. (2023). The effect of yoga on pulmonary function in patients with asthma: A meta-analysis. *Complementary Therapies in Clinical Practice*, 50, 101682.
2. Andreasson, K. H., Skou, S. T., Ulrik, C. S., Madsen, H., Sidenius, K., Assing, K. D., et al. (2022). Breathing exercises for patients with asthma in specialist care: A multicenter randomized clinical trial. *Annals of the American Thoracic Society*, 19(9), 1498–1506.
3. Asthana, S., Patel, V., & Gokhale, L. R. (2020). Effect of pranayama breathing technique on asthma control, pulmonary function, and quality of life: A randomized controlled trial. *Complementary Therapies in Clinical Practice*, 38, 101081. <https://doi.org/10.1016/j.ctcp.2019.10108>
4. Global Initiative for Asthma. (2023). *Global strategy for asthma management and prevention*. Retrieved January 30, 2026, from <https://ginasthma.org>
5. Joshi, L. N., Joshi, V. D., & Gokhale, L. V. (1992). Effect of short term “pranayama” practice on breathing rate and ventilatory functions of lung. *Indian Journal of Physiology and Pharmacology*, 36(2), 105–108.
6. Karpagam, K. K., Ramasamy, D., & Vijayaraghavan, D. (2025). Effect of Buteyko breathing technique and pranayama on bio-physiological and biochemical parameters in bronchial asthma. *International Journal of Life Science and Pharma Research*, 15(1), L10–L17. <https://doi.org/10.22376/ijlpr.2025.15.1.L10-L17>
7. Nagarathna, R., & Nagendra, H. R. (1985). Yoga for bronchial asthma: A controlled study. *British Medical Journal (Clinical Research Edition)*, 291, 1077. <https://doi.org/10.1136/bmj.291.6502.1077>
8. Santino, T. A., Chaves, G. S. S., Freitas, D. A., Fregonezi, G. A. F., & Mendonça, K. M. P. P. (2020). Breathing exercises for adults with asthma. *Cochrane Database of Systematic Reviews*, 3(3), CD001277.
9. Singh, S., Soni, R., Singh, K. P., & Tandon, O. P. (2012). Effect of yoga practices on pulmonary function tests including transfer factor of lung for carbon monoxide (TLCO) in asthma patients. *Indian Journal of Physiology and Pharmacology*, 56(1), 63–68.
10. Sodhi, C., Singh, S., & Dandona, P. K. (2009). A study of the effect of yoga training on pulmonary functions in patients with bronchial asthma. *International Journal of Yoga Physical Therapy*, 53(2), 169–174.
11. Turan, G. B., & Tan, M. (2020). The effect of yoga on respiratory functions, symptom control and life quality of asthma patients: A randomized controlled study. *Complementary Therapies in Clinical Practice*, 38, 101070.
12. World Health Organization. (2023). *Asthma fact sheet*. Retrieved January 30, 2026, from <https://www.who.int>
13. Yadav, A., Sindhwani, G., Kumari, R., Goel, A., & Bisht, K. (2024). Effect of adjuvant yoga therapy for asthma control: A randomized controlled trial. *Journal of Ayurveda and Integrative Medicine*, 15(1), 100847.
14. Yüce, G. E., & Taşçı, S. (2020). Effect of pranayama breathing technique on asthma control, pulmonary function, and quality of life: A single-blind, randomized, controlled trial. *Complementary Therapies in Clinical Practice*, 38, 101081.