



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**

'A Bridge Between Laboratory and Reader'

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EFFICACY OF BHUTSHUDDHIKRIYA (BREATHING TECHNIQUE) ON PULMONARY FUNCTION IN HEALTHY VOLUNTEER-A CASE REPORT

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Received 13th Sept. 2024; Revised 25th Nov. 2024; Accepted 25th Jan. 2025; Available online 1st Feb. 2026

<https://doi.org/10.31032/IJBPAS/2026/15.1.9799>

ABSTRACT

This paper investigates the impact of Bhutshuddhikriya, an ancient breathing technique, on pulmonary function in a healthy volunteer. The study was conducted at Khemdas Ayurved Hospital, Parul Institute of Ayurved and Research, Parul University, under the supervision of Dr. Dinesh Pulmonary function was assessed using forced vital capacity (FVC), forced expiratory volume (FEV), FVC/FEV ratio, and peak expiratory flow rate (PEFR) over a 30-day period. Notable improvements in pulmonary metrics were observed, demonstrating the potential efficacy of Bhutshuddhikriya for respiratory health enhancement.

Keywords: Bhutshuddhikriya, Forced expiratory volume, Forced vital capacity, peak expiratory flow rate, Pulmonary function

INTRODUCTION

Complementary and alternative medicine (CAM) is described by the World Health Organization as a broad range of healthcare practices that are not part of a nation's

traditional medical system and are not fully integrated into its mainstream healthcare framework [1, 2]. Over time, CAM has grown in global popularity, with an

estimated 70%–80% of people in developed countries having used some form of CAM during their lifetime [3]. CAM therapies can generally be divided into two main categories: natural products, such as herbs, and mind-body practices. The latter involves techniques administered or taught by trained practitioners, and Yoga is one prominent example within this domain [4].

Pranayama and Breathing practices are spiritual and ascetic discipline with a 3,000-year history, has gained widespread recognition as a CAM practice in recent years. It aims to harmonize the physical, mental, emotional, and spiritual aspects of a person's well-being [5, 6].

Breathing techniques, known as Pranayama, are widely recognized for their benefits in improving respiratory function and mental well-being. Bhutshuddhikriya is process based on restive rhythmic breathing and practices of synchronized hand movements which helps in building our respiratory capacity, relives anxiety and improves our body immunity through balancing of five great element of our body [7-10].

Maharshi Gaj Arvind is the inventor of this wonderful breathing practice named *Bhutshuddhikriya*. Bhutshuddhikriya is a Sanskrit word that is formed by the union of 'Bhuta', 'Shuddhi' and 'Kriya'. *Bhuta* - means five great elements, *Shuddhi*- means purification and *Kriya* means process. Thus, Bhutshuddhikriya literally means process of

purification of five elements. There are some references in ancients *Granthas* denoting importance of *Bhutashudi*, In verse 1 of chapter8 of *Shrimat Bhagavata-Maharsh ivedvyasa* says

- "I am telling the process & type of five element purification for awakening hidden spiritual/ cosmic energy to achieve *ashtasiddhi*."

"In another reference in verse 42 of chapter 6 of *Rudrayamal Tantra* scripture it is explained There are infinite/latent powers inside the body which are generally in dormant stage, which do not activate without doing purification of cosmic elements."

The concept of five great elements is basic with regards to human origin and life. According to Ayurveda and Indian philosophy human body is constituted from five elements (Kunjalal, Kaviraj; Sharirsthana, n.d.) (Rudradev Tripathi, n.d.) The classical Ayurvedic therapy is based on *Tridosha Siddhanta* (*Tri* = three, *dosha* = cardinal humour, *siddhanta* = theory). Each of these three humours, as well as every other things found in the nature, are formed from the five universal elements collectively they known as *panchamahabhutas* (five great elements). These five elements are: *Prithvi* – earth, *Aap* – Water, *Tej* – Fire, *Vayu* - Air & *Akash* – Ether. A single living cell is a unique combination of these five elements- the earth element gives structure

to the cell. The water element is present in the cytoplasm or the liquid within the cell membrane. The metabolic processes being carried out in the cell symbolize the fire element. The gaseous exchange taking place symbolizes the air element. The space occupied by the cell symbolizes the Space or ether element. The equilibrium of these five great elements in the body denotes health while imbalance or disturbance denotes *rog*(disease) [9-12].

Shabda Pranayama

- ‘Shabda Pranayama’ is deep vibratory action through vocal cord, via exerting its lock mechanism on vocal cord making them tense hence this produce more respiratory sound effect which can be heard even through human ear. This specific breathing method is practiced during each step of Bhutshuddhi kriya
- Resistive rhythmic breathing technique is key of whole process i.e. breath produced sound from throat during respiration. This typical slow, steady and deep breathing process helps better oxygenation of lung and tissue by improving ventilation perfusion ratio, simultaneously it helps in excretion of carbon dioxide. This deep breathing also help in mental relaxation & sympathovagal balance through parasympathetic system activation [13].

This deep resistive breathing process help to energies our body.

- According to Ayurveda, there is vital role of Vayu tatva (Air Element) which is also called Vata in human body. This Vata is also called as PRANA. This Prana tatva [14] is responsible for every sort of movements in body. Ayurveda has explained some important concepts of Air element (Vayu/ Vata). Every system and every organ in the body is controlled by Vayu. And very important concept to notify is, our mind is governed by Vayu. Vayu is [15] responsible for expression of all other elements. Every breathing movement is controlled by Vayu Tatva. Ayurveda cannot imagine life without Vayu/ Prana. Vayu is responsible for strength, life vitality and for every essential activity in body, so, Vayu/Prana is master of human body.
- Multiple hand movement are complimented with deep breathing process. Hand movement facilitate the deep breathing process by activating respiratory accessory muscles, fixation of scalene muscles for action of intercostal bucket handle mechanism. Help to improve posture & anteroposterior diameter of chest. All action (Hand Movement) mentioned below should be accompanied with

resistive rhythmic breathing process [14].

There is change in observation focus during every step of Bhutshuddhi kriya. This is because of two basic concepts; first the nature of our mind is flying attention is known as mind wandering. When we try to focus on single entity for longer duration of time it starts creating internal stress. Being part of mind management, our focus of observation is keep rotated. This is one way to combat with mind wandering & increase our self-awareness. Second concept is that according to traditional Indian medical system & Sankhya Darshan Our human body is compose of five great element (*matter*) and energy (*consciousness*). Energy is what drives and control the five great elements. Our body although compose of five great elements but proportion of every element in different body our body part symbolically our legs represent & sacral represent earth, pelvis & bladder area represent water, our stomach and naval area represent of fire, chest and lung representing air & our head neck represent Ether. As our observation focus on some part of body there is channelization of Pranic energy to that part this leading to activation of particular body part and body element [15, 16].

CASE REPORT

Patient Information

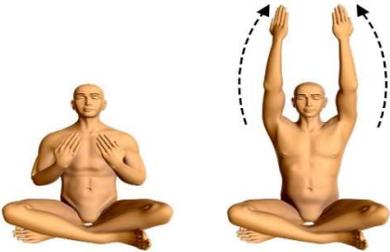
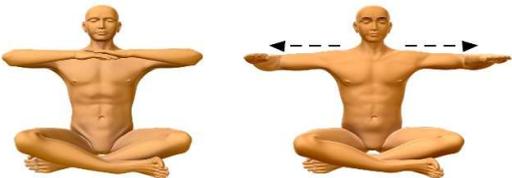
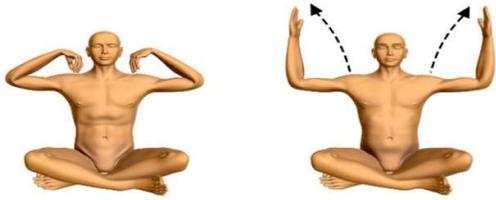
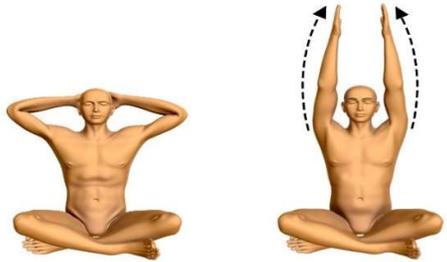
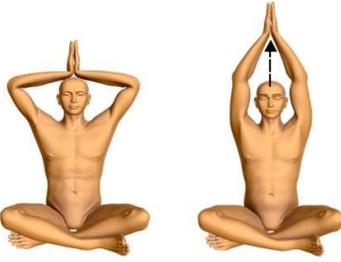
A 22-year-old male student, participated in this study to assess the impact of Bhutshuddhikriya on pulmonary function. He had no prior history of chronic illnesses, respiratory conditions, or smoking habits, and was not on any medication during the study. He was generally healthy and engaged in regular physical activities but had no prior experience with yoga or breathing techniques. The study was conducted under the supervision of Dr. Dinesh at Khemdas Ayurved Hospital, Parul Institute of Ayurved and Research, Parul University, starting on July 31, 2023.

Methodology

There are total of 10 steps in Bhutshuddhi kriya, each step has specific importance based on duration and breath counts the entire process has been divided into 3 categories – Short, Medium and Advanced for purpose of understanding medium level Bhutshuddhikriya is discussed here; Approximate time duration to complete medium level process is 30 minutes.

Four weeks of practice is required to see desired results in form of better work capacity, endurance, stress response and emotional wellbeing of an individual (**Table 1**).

Table 1: Detailed explanation of individual steps of Bhutshuddhikriya

Details Explanation of Individual Steps	
<p><u>Kavchay Hum:</u></p> <ul style="list-style-type: none"> • Observation focus on forehead between eyebrows. • Activation hypothalamus – pituitary gland. • Breathing rate - Slow, Med, Fast, 15 repetitions each • Works as initial boost to cardio – respiratory system, sudden fast breathing activates cardiac output and blood supply is shunted respiratory system. • Activation of pectoral, serratus & latissimus group of muscles. 	
<p><u>Kar-tal-kara:</u></p> <ul style="list-style-type: none"> • Observation on Coccygeal region, activation of gonadal glands. Help in balance of earth element. • Breathing rate – very slow, Repetitions- 10 times • This slow breathing help in better oxygen exchange by lung and as deep breathing help in minimising dead space ventilation more oxygen available for gaseous exchange. • This action help in pectoral strengthening. • Second time same process is repeated focus change to lung area – which help balance air element. 	
<p><u>Astraya Phat:</u></p> <ul style="list-style-type: none"> • Breathing rate –slow; Repetitions- 20 times • Observation on pelvic area, help in balancing of water element. • This action helps in activation scalene & shoulder muscles. • Same process is repeated second time focus change around neck area. 	
<p><u>Shikhay Vashat:</u></p> <ul style="list-style-type: none"> • Breathing rate –slow; Repetition – 30 times • Observation- around naval area • This action help in strengthening of upper back and neck muscles. • The same process is repeated focus change to forehead second time 	
<p><u>Shirse Swaha:</u></p> <ul style="list-style-type: none"> • Breathing rate –slow, medium, fast • Repetition 15 repetition each slow, medium & fast. • Observation focus is on crown area • This action help in scalene, intercostal & scapular muscle strengthening. 	

Observation stage: State of self-awareness, no imagination and stress. This stage help in relaxation of your mind & activate parasympathetic nervous system. This stage of Observation last for approximately five minutes.

Vocal Chanting stage: Take deep breath and chant sound of syllables A, U & M each sequentially for times while there is change in focus with focussing downward from crown to sacral point as mentioned and then upward sacrum to crown each time.

Bhutshuddhikriya was introduced as the primary intervention for the patient, with a structured routine for 30 days. The breathing

technique was practiced daily for 30 minutes in a seated, cross-legged posture. The patient was instructed to do proper *Shabda Pranayama during each step*. In this technique, practitioners engage in specific breathing patterns while chanting or listening to particular sounds, mantras, or words. The goal is to achieve a heightened state of mental clarity, relaxation, and spiritual awareness through the vibrational energy of sound.

Pulmonary function tests (PFTs) were performed on Day 1 and Day 30 to monitor changes in respiratory metrics (**Table 2**).

Table 2: Pulmonary Function Tests

Parameters	Day1	Day 30	Change
% Forced Vital Capacity (FVC)	110	132	+22%
% Forced Expiratory Volume (FEV1)	101	107	+6%
FEV1/FVC Ratio	92	81	-11%
%Peak Expiratory Flow Rate (PEFR)	48	48	No change

RESULTS

Forced Vital Capacity (FVC)

A marked improvement was observed, with FVC increasing from 110% on Day 1 to 132% on Day 30, reflecting a 22% enhancement. This indicates a significant increase in the patient's lung capacity and overall respiratory efficiency (**Figure 1**).

Forced Expiratory Volume (FEV)

The FEV showed a modest improvement from 101% on Day 1 to 107% on Day 30, with a 6% increase. This suggests better airflow during forced expiration, contributing to improved respiratory function (**Figure 1**).

FEV/FVC Ratio

Interestingly, the FEV/FVC ratio decreased from 92% on Day 1 to 81% on Day 30, which might indicate a relative increase in lung capacity compared to the rate of expiration. While this may not align with typical expectations, it could signify the body's adaptation to increased lung volumes (**Figure 1**).

Peak Expiratory Flow Rate (PEFR)

No significant change was noted in the PEFR, which remained constant at 48 L/min on both Day 1 and Day 30. This suggests that the technique did not influence the maximum speed of expiration (**Figure 1**).

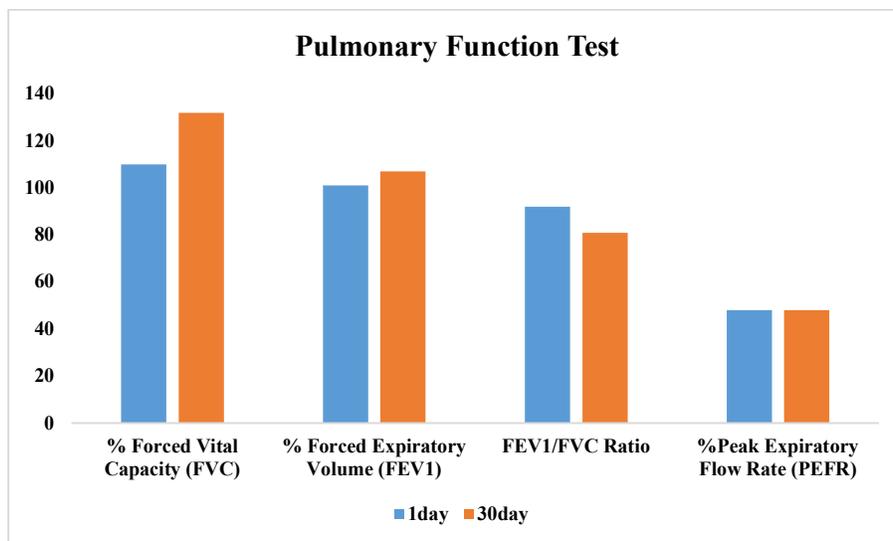


Figure 1: Pulmonary function test from day 1 to day 30

DISCUSSION

The study focused on assessing the impact of Bhutshuddhikriya, an ancient breathing technique, on pulmonary function in a healthy 22-year-old male over a 30-day period. The results of this study indicate that Bhutshuddhikriya has a positive effect on certain pulmonary parameters, particularly Forced Vital Capacity (FVC) and Forced Expiratory Volume (FEV), while others, such as the Peak Expiratory Flow Rate (PEFR), remained unaffected. This discussion will explore the significance of these findings, possible physiological mechanisms, and the broader implications for respiratory health.

One of the most significant findings in this study was the marked improvement in Forced Vital Capacity (FVC), which increased by 22% over the 30-day period. FVC measures the amount of air an individual can forcibly exhale after taking a

deep breath, making it a key indicator of lung capacity and overall respiratory health. The substantial increase in FVC suggests that Bhutshuddhikriya enhances lung capacity and efficiency, likely by improving the elasticity of lung tissues and strengthening respiratory muscles.

The breathing techniques incorporated in Bhutshuddhikriya, such as deep resistive breathing and Shabda Pranayama, likely contribute to this improvement. Deep breathing allows for better oxygenation of the lung tissues, improves ventilation-perfusion ratio, and enhances the exhalation of carbon dioxide. Additionally, the rhythmic hand movements and posture changes involved in the practice might activate accessory respiratory muscles like the intercostal and scalene muscles, facilitating greater expansion of the chest and lungs. This would lead to an increase in

lung capacity, as reflected in the FVC measurement.

The Forced Expiratory Volume (FEV1), which measures the amount of air exhaled in the first second of a forced breath, also showed a modest improvement of 6%. This increase indicates that Bhutshuddhikriya enhances airflow during the initial phase of forced expiration. Improved FEV suggests better airway resistance, which is often associated with improved bronchodilation and reduced airway obstruction.

The techniques within Bhutshuddhikriya may also have helped reduce parasympathetic dominance, which can cause bronchoconstriction. By enhancing sympathovagal balance and promoting parasympathetic activation through deep, slow breathing, Bhutshuddhikriya may have improved bronchodilation, facilitating better airflow during expiration. Moreover, improved lung compliance and elasticity from regular deep breathing could contribute to these improvements in FEV1.

One of the more surprising findings of the study was the 11% decrease in the FEV/FVC ratio. Conventionally, the FEV/FVC ratio is used to diagnose obstructive or restrictive lung diseases, with a lower ratio often indicating obstructive patterns (such as in asthma or chronic obstructive pulmonary disease). However, in the context of this study, the decrease in the ratio likely reflects the disproportionate

increase in lung capacity (FVC) compared to the rate of expiration (FEV1).

The body's adaptation to increased lung volumes without a proportional increase in expiratory speed could explain this change. While this reduction may seem counterintuitive, it may indicate that the lungs are adapting to a larger volume of air during breathing exercises, prioritizing greater capacity over the speed of exhalation. This observation warrants further investigation, particularly in understanding how Bhutshuddhikriya affects lung mechanics over longer periods. Interestingly, the study found no significant change in the Peak Expiratory Flow Rate (PEFR), which remained constant at 48 L/min. PEFR measures the maximum speed of exhalation, and is often used to monitor conditions like asthma, where airway obstruction is a concern. The lack of change in PEFR suggests that Bhutshuddhikriya does not significantly impact the speed of exhalation, at least in healthy individuals.

This result could be attributed to the fact that Bhutshuddhikriya focuses more on slow, resistive breathing rather than rapid exhalation. The practice emphasizes controlled, deep inhalation and exhalation, which may improve lung volume and air exchange but not necessarily affect the speed at which air is expelled from the lungs. It is also possible that the healthy state of the subject's lungs at the beginning of the

study left little room for improvement in PEFR.

The findings from this study suggest that Bhutshuddhikriya has the potential to be a valuable practice for improving pulmonary function, especially in healthy individuals. The observed improvements in FVC and FEV1 suggest that it can help enhance lung capacity and airflow, making it a useful adjunct to respiratory therapies or general well-being practices. While no changes were observed in PEFR, this may not detract from the overall benefit of the practice, which seems to prioritize lung volume over the speed of exhalation.

Future studies could explore the impact of Bhutshuddhikriya in individuals with respiratory disorders such as asthma or chronic obstructive pulmonary disease (COPD). Additionally, a longer duration of practice may reveal further improvements in other pulmonary metrics, including PEFR and FEV/FVC ratio. Incorporating larger sample sizes and control groups could also strengthen the evidence for Bhutshuddhikriya's effectiveness as a complementary respiratory therapy.

In summary, Bhutshuddhikriya demonstrates promising potential for improving pulmonary function, particularly in terms of lung capacity and airflow. The practice's emphasis on deep breathing, sound vibrations, and rhythmic movements likely contributes to these improvements by

strengthening respiratory muscles, enhancing lung compliance, and promoting relaxation. While the reduction in the FEV/FVC ratio may seem unconventional, it reflects the body's adaptation to increased lung volumes. Further research is needed to explore the long-term effects and potential applications of Bhutshuddhikriya in clinical settings.

CONCLUSION

This case study demonstrates that Bhutshuddhikriya may enhance pulmonary function in healthy individuals, particularly by increasing lung capacity and improving expiratory control. While further studies with larger cohorts are needed to generalize these findings, the results offer promising evidence of the efficacy of this breathing technique in promoting respiratory health.

FUTURE RECOMMENDATIONS

To build on these findings, further research should explore the impact of Bhutshuddhikriya across various populations, including individuals with respiratory conditions. Additionally, longitudinal studies with more detailed quality of life assessments could provide a broader understanding of the technique's holistic benefits.

ACKNOWLEDGEMENT

Authors are thankful to the Parul Institute of Ayurved and Research, Parul University for the conduction of the study.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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