ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1879

# Integrating Yogic Practices in Asthma Management: A Physiological and Theoretical Perspective

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Publication Date: 2025/06/04

**Abstract: Asthma is a chronic inflammatory disorder of the airways which poses significant challenges in management due to its multifactorial aetiology and complex pathophysiology. Conventional treatments primarily focus on symptom control and inflammation suppression through pharmacological interventions, having many adverse drug reactions. However, complementary approaches such as yogic practices have gained attention for their potential in enhancing respiratory function, reducing stress-related exacerbations, and improving autonomic regulation. This review consolidates existing scientific literature and traditional yogic principles to explore the effects of yogic practices in the management of asthma. By examining the physiological mechanisms of yogic practices, the study aims to provide an insight into the holistic benefits of yoga in asthma management, offering a potential adjunctive and non-pharmacological pathway for improving respiratory health.**

**How to Cite:** Yudhishthir Sharma; Dr. Asim Kulshreshtha (2025) Integrating Yogic Practices in Asthma Management: A Physiological and Theoretical Perspective. *International Journal of Innovative Science and Research Technology*, 10(5), 3151-3155. https://doi.org/10.38124/ijisrt/25may1879

## I. INTRODUCTION

Breathing is a fundamental physiological process which is essential for the living organism to sustain life. It is also termed as respiration, derived from the root word ‘respirare’, meaning ‘breath again’ or ‘breath in and breath out’. Respiration incorporates inspiration, which means ‘to breathe in’, and expiration, which means ‘to breathe out’. Every breath includes breathing air from the atmosphere, using the oxygen part from the air for cellular metabolism and breathing out the carbon dioxide as a metabolic waste. This process ceaselessly keeps functioning optimally until the maladies originate in the form of respiratory diseases like asthma, COPD, bronchitis, pneumonia, etc. Respiratory disorders are primary contributors to mortality and morbidity globally. Respiratory diseases can be chronic or acute and may range from mild to severe symptoms. As per the Global Burden of Diseases 2019, chronic respiratory diseases (CRDs) were ranked as the third largest cause of mortality, accounting for 4.0 million deaths (95% uncertainty interval 3.6–4.3) and a global prevalence of 454.6 million cases (Momtazmanesh et al., 2023).

Asthma is one of the most common chronic non-communicable respiratory diseases, affecting over 262 million individuals and causing more than 455,000 fatalities in 2019 worldwide (Lancet, 2024), the majority of which can be prevented with timely medication and awareness towards the disease. Shortness of breath, coughing, wheezing, and limited expiratory airflow, caused by airway inflammation, are the most common symptoms of asthma (Kaminsky, 2011).

Early diagnosis and treatment, along with avoiding smoking and air pollution, are key to managing and preventing respiratory diseases (Lancet, 2024). Conventional treatment includes the inhaled medicines (bronchodilators), corticosteroids and beta-agonists that can open the airways and relieve the symptoms. Although these medications reduce the symptoms temporarily, adverse drug reactions are common. For

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example, systemic corticosteroids, which are frequently used during exacerbations, can cause weight gain, hypertension, and osteoporosis if administered for an extended period of time (Aagaard & Hansen, 2014). Inhaled corticosteroids are often used to treat airway inflammation; however, if adequate inhaler technique is not followed, they might cause possibly local adverse effects such as hoarseness and oral candida (Aagaard & Hansen, 2014). Similarly, beta-agonists, which are used to achieve fast bronchodilation, can cause tremors, tachycardia, and even cardiac arrhythmias, which are dangerous for individuals with underlying heart issues (Aagaard & Hansen, 2014). Some patients may also develop tolerance to certain medications, reducing their efficacy over time, which indicates pharmacological interventions may not address the underlying causes of asthma, and patients may still experience symptoms despite adherence to treatment. Hence, alternative solutions are indispensable.

Dissatisfied with conventional treatments and side effects, people are seeking more holistic and natural approaches to health. Complementary and alternative medicine (CAM) is offering a comprehensive approach to wellness, focusing on prevention and treating in a holistic way. Yoga is a popular complementary and alternative therapy which combines physical postures, breathing techniques, and meditation to promote overall well-being. It reduces stress, enhances relaxation, improves flexibility and develops mind-body connection by fostering self-awareness.

The purpose of this study is to explore the theoretical basis and potential mechanisms through which yogic practices impact asthma management.

## II. ASTHMA: DEFINITION, TYPES, ETIOLOGY, PATHOPHYSIOLOGY AND PSYCHOSOMATIC DIMENSIONS

### *A. Definition*

Asthma is a heterogeneous condition due to its multiple aetiologies (genetic and environmental). It is a chronic airway inflammation accompanied with respiratory symptoms like coughing, wheezing, discomfort in the chest, restricted breathing and shortness of breath, varying in symptoms and intensity over time. The airflow obstruction is often caused by bronchospasm (muscle contraction in the airway walls) or airway inflammation, which can be triggered by allergens, irritants, exercise or other stimuli. The sudden onset of asthma symptoms (chest tightness, shortness of breath, coughing and wheezing) is known as exacerbations or flare-ups or asthma attacks. It is a reversible condition, which means symptoms can be partially or fully improved on their own with the passage of time or with the intervention of the right medication.

### *B. Types of Asthma –*

- **Atopic (Allergic) –** It is also known as extrinsic asthma. The exacerbation or flare-ups are triggered by the external allergens present in the environment and mediated by the Type I hypersensitivity reaction (Pekkanen et al., 2012).

- **Non-Atopic (Non-Allergic) -** Non-atopic, also known as intrinsic asthma. It is not linked to allergens but triggered by factors like viral infections, aspirin, cold air, and psychological stress (Pekkanen et al., 2012).

- **Mixed –** It is a combination of both extrinsic and intrinsic.

### *C. Etiology of Asthma –*

Although the exact cause of asthma is not fully known, the available literature indicates the following contributing factors:

- **Genetic Predisposition** – A family history of asthma increases the likelihood of developing the condition of asthma at an early age in childhood (Subbarao et al., 2009).
- **Environmental triggers** – Exposure to allergens like pollen, dust mites, mould, pet dander and irritants like smoke, chemical fumes, Strong odours like perfumes can also trigger asthma symptoms (Vernon et al., 2012).
- **Respiratory infections** – Viral infections, especially in early childhood, can influence lung development and contribute to asthma (Subbarao et al., 2009).
- **Obesity** – Being overweight has been associated with a higher risk of asthma and worsened symptoms (Quinto et al., 2011).
- **Prenatal influences** – Factors such as maternal smoking during pregnancy and low birth weight have been linked to asthma (Zacharasiewicz, 2016).

### *D. Pathophysiology of Asthma –*

Pathophysiology denotes the functional modification in the physiology during the development of the disease causing symptoms and complications. In asthma it involves the complex interplay of environmental triggers, airway remodelling and immune system dysregulation. In asthma, normal physiology is altered due to three main features:

- **Inflammation of the airway** : The airways in asthma become chronically inflamed due to inflammatory cells such as eosinophils, mast cells, and T-helper 2 (Th2) lymphocytes infiltrating the airway wall. These cells release cytokines (e.g., IL-4, IL-5, IL-13), leukotrienes, and histamines that promote further inflammation, mucus production, and sensitisation of the airways to various stimuli (Barnes, 2017).
- **Bronchial Hyperresponsiveness leading Bronchospasm** : Asthmatic airways are hyperreactive, meaning they respond excessively to triggers such as allergens, cold air, exercise, or pollutants. This causes exaggerated bronchoconstriction due to the smooth muscle in the airway walls contracting too much and too easily. This hyperresponsiveness is a hallmark

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of asthma and contributes to the variable nature of airflow obstruction (Barnes, 2017).

- **Reversible Airflow Obstruction**: The combination of bronchoconstriction, airway wall edema, mucus plugging (due to hypersecretion by goblet cells), and inflammatory cell infiltration narrows the airway lumen, leading to reduced airflow, particularly during exhalation. This obstruction is typically reversible, either spontaneously or with bronchodilator medications like β2-agonists (Bush, 2019).

*E. Psychosomatic Aspect*

Psychological factors such as stress, anxiety and emotional disturbance can trigger asthma symptoms, which indicates the intricate relationship between the mind and the respiratory health of the body. Emotional stress can lead to airway inflammation and bronchoconstriction, worsening asthma symptoms (Wójtowicz et al., 2011). Asthma patients often experience heightened anxiety, which can lead to hyperventilation and increased airway sensitivity (Baiardini et al., 2015).

## III. YOGIC PRACTICES: COMPONENTS AND PHYSIOLOGICAL EFFECTS ON RESPIRATORY HEALTH

**Yoga** is an ancient Indian discipline that integrates physical, mental, and spiritual practices to promote harmony between body, mind, and soul. Studies indicate that yogic practices improve the symptoms related to respiratory distress. Practices—such as **pranayama** (breath control), **asanas** (physical postures), and **meditation**—can enhance lung function, reduce airway reactivity, and promote relaxation. Yogic practices, if practised daily with the conventional medical treatments, can be a valuable adjunct therapy for managing symptoms and improving quality of life in patients with respiratory distress (Yadav et al., 2021).

*A. Components of Yoga:*

The components of yoga are traditionally described by sage *Patanjali* in the *Yoga Sutras* in the form of *Ashtanga Yoga* (the "Eight Limbs of Yoga"). These components guide the individuals toward physical health, mental clarity, and spiritual enlightenment step by step. The *Ashtanga yoga* comprises *yama, niyama, asana, pranayama, pratyahara, dharana, dhyana and samadhi.* Gheranda Rishi, in Gheranda Samhita, a Hatha Yoga book, has classified the Hatha Yoga sadhana in seven stages: shatkarma, asana, mudra, pratyahara, pranayama, dhyana and samadhi (Saraswati, 2012). Every component of yoga either directly or indirectly influences the respiratory health of the individual if practised with adherence and faith.

*B. Physiological Effect of Yogic Practices:*

➢ *Shatkarma:*

Shatkarma are the six yogic cleansing practices which are done to purify the body and the mind. Dhauti, one of the shatkarma, is found to be very effective in establishing normal pulmonary function in asthma. Dhauti is categorised into four types according to Gheranda Samhita. Among all four, the most popular cleansing techniques are vamana dhauti, which is also known as kunjal kriya, vastra dhauti, and shankhprakshalana. These techniques have been found to be effective in improving pulmonary function and increasing vagal toning. Kunjal kriya and vastra dhauti induce the expulsion of excessive mucus and hence clear the airway and decrease the airway resistance, which allows better emptying of the lungs (Balakrishnan et al., 2018).

➢ *Asana:*

Asana refers to the physical posture practised to promote strength, flexibility, balance, and inner awareness. It is the third component of yoga given by the sage Patanjali. Asanas such as Ushtrasana, Ekpada Uttanasana, Tarasana, Simhasana, Sarvangasana, Matsyasana, Uttanasana, Dhanurasana, Setu Bandhasana, and Shavasana improve flexibility, strengthen chest muscles, open the chest wall, promote better posture and facilitate better breathing. Backward bending postures such as bhujangasana and setubandhasana expand the thoracic cavity and improve diaphragmatic movement, thereby aiding in deeper, more controlled breathing (Nivrutti et al., 2017).

Asana also helps in the modulation of neuroendocrine response. Asanas (yogic postures) are more than physical exercises—they act as neurophysiological tools that influence the neuroendocrine system, which includes the interactions between the nervous system and hormone-secreting glands (Eda et al., 2020). Studies show that regular practice of yoga asana can lower cortisol levels, thereby countering the adverse effects of stress (Lim & Cheong, 2015).

➢ *Pranayama:*

Pranayama is the regulation of the ‘prana’. The word ‘pranayama’ comes from Sanskrit. *"Prana"* means vital force or life energy; *"Ayama"* means control, expansion, or extension. Thus, pranayama means the control or expansion of life force through breathing techniques. It is the fourth limb of Ashtanga yoga. Studies show that pranayama plays a vital role in managing asthma symptoms by improving respiratory efficiency. Bhastrika pranayama strengthens respiratory muscles and improves lung function. Kapalbhati helps to clear mucus buildup. Bhramari pranayama reduces stress, soothes the airway and improves oxygen exchange. Anulom-vilom calms the mind, enhances breathing patterns and regulates the autonomic nervous system.

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The above pranayama techniques improve pulmonary parameters like forced vital capacity (FVC), forced expiratory volume in one sec (FEV1) and peak expiratory flow rate (PEFR), leading to enhanced respiratory function (Yüce & Taşcı, 2020). The controlled breathing techniques reduce inflammation in the bronchial tubes, thus reducing asthma exacerbations (Parmar & Nagarwala, 2014). Deep and rapid breathing techniques like bhastrika and kapalbhati improve the tonicity and strengthen the respiratory muscles (intercostal muscles and diaphragm) (Bagade et al., 2018) (Arulmozhi et al., 2018). Pranayama also balances the parasympathetic and sympathetic nervous systems, reducing bronchial hyperresponsiveness (Yüce & Taşcı, 2020).

- *Meditation:*

The word "meditation" in yoga is "Dhyana", the seventh limb of Patanjali's Ashtanga Yoga. It focuses attention and encourages awareness and aims to bring mental processes under greater voluntary control by producing a sense of relaxation and inner peace. This can be very helpful in managing asthma because it can lower the psychological conditions that trigger or contribute to asthma attacks, such as stress, anxiety, and panic (Cheryl et al., 2017). Meditation acts as a supportive therapy that enhances overall well-being and can reduce the frequency and severity of symptoms (Paudyal et al., 2018).

Meditation, particularly mindfulness and focused breath approaches, helps to relax the autonomic nervous system by lowering sympathetic (fight-or-flight) reactions and increasing parasympathetic activity. This modulation improves airway muscular relaxation, better breathing patterns, and a sensation of control during episodes of asthma attacks (Paudyal et al., 2018).

## IV. CONCLUSION

Yoga is an ancient Indian discipline that integrates physical, mental, and spiritual practices to promote harmony between body, mind, and soul. Various studies show that regular practice of asana, pranayama and meditation enhances respiratory function and improves relaxation, thus reducing asthma attacks, which decreases the use of rescue medication. Yoga complements and supports standard conventional treatment, thus reducing triggers and improving overall quality of life. Thus, yoga justifies and can be a non-pharmacological and adjuvant therapy in the management of asthma.

## REFERENCES

[1]. Aagaard, L., & Hansen, E. H. (2014, feb 23). Adverse drug reactions associated with asthma medications in children: systematic review of clinical trials. *International Journal of Clinical Pharmacy*, *36*, 243-252. https://doi.org/10.1007/s11096-014-9924-y

[2]. Arulmozhi, S., Joice, S., & Maruthy, K. N. (2018). Effect of pranayama on respiratory muscle strength in chronic asthmatics. *National Journal of Physiology, Pharmacy and Pharmacology*, *8*(12).

[3]. Bagade, A. H., Bhonde, M. S., & Dhokane, N. B. (2018). Effect of pranayama on respiratory endurance in young adults. *National Journal of Physiology, Pharmacy and Pharmacology*, *8*(8).

[4]. Baiardini, I., Sicuro, F., Balbi, F., & Canonica, G. W. (2015, August 5). Psychological aspects in asthma: do psychological factors affect asthma management? *Asthma Research and Practice*, *1*(7). https://doi.org/10.1186/s40733-015-0007-1

[5]. Balakrishnan, R., Nanjundaiah, R. M., & Manjunath, N. K. (2018). Voluntarily induced vomiting – A yoga technique to enhance pulmonary functions in healthy humans. *Journal of Ayurveda and Integrative Medicine*, *9*(3). https://doi.org/10.1016/j.jaim.2017.07.001

[6]. Barnes, P. J. (2017). Cellular and molecular mechanisms of asthma and COPD. *Clinical Science*, *131*. 10.1042/CS20160487

[7]. Bush, A. (2019, march 19). Pathophysiological Mechanisms of Asthma. *Frontiers in Pediatrics*, *7*. https://doi.org/10.3389/fped.2019.00068

[8]. Cheryl, M., Karen, L., & Nilani, L. (2017). Mindful Meditation for Individuals with Asthma and Anxiety: Promising Results from a Multiple Baseline Study. *Journal of Yoga & Physical Therapy*, *7*(1). 10.4172/2157-7595.1000262

[9]. Eda, N., Ito, H., & Akama, T. (2020, November 19). Beneficial Effects of Yoga Stretching on Salivary Stress Hormones and Parasympathetic Nerve Activity. *Journal of sports science and medicine*, *19*(4). https://pmc.ncbi.nlm.nih.gov/articles/PMC7675619/

[10]. Kaminsky, D. A. (2011). *The Netter Collection of Medical Illustrations - Respiratory System* (second ed., Vol. 3). Elsevier saunders.

[11]. Lancet. (2024, May 6). *Asthma*. World Health Organization (WHO). Retrieved May 13, 2025, from https://www.who.int/news-room/fact-sheets/detail/asthma

[12]. Lim, S. A., & Cheong, K. J. (2015, September 3). Regular Yoga Practice Improves Antioxidant Status, Immune Function, and Stress Hormone Releases in Young Healthy People: A Randomized, Double-Blind, Controlled Pilot Study. *The Journal of Alternative and Complementary Medicine*, *21*(9). https://doi.org/10.1089/acm.2014.0044

[13]. Momtazmanesh, S., Moghaddam, S. S., & Ghamari, S. H. (2023). Global burden of chronic respiratory diseases and risk factors, 1990–2019: an update from the Global Burden of Disease Study 2019. *the lancet*, *59*. https://www.thelancet.com/action/showPdf?pii=S2589-5370%2823%2900113-X

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may1879

[14]. Nivrutti, B. A., Madhukar, L. S., & Bhatngar, V. (2017, June). CRITICAL EVALUATION ON METICULOUSNESS OF YOGA ASANA IN THE MANAGEMENT OF TAMAK SHWASA (BRONCHIAL ASTHMA). *European Journal of Pharmaceutical and Medical Research*, *4*(6).
[15]. Parmar, J., & Nagarwala, R. (2014, Jan-June). Effects of Pranayama on Bronchial Asthma. *International Journal of Physiology*, *2*(1), 96-101. https://www.researchgate.net/profile/Jayesh-Parmar-8/publication/269745680_Effects_of_Pranayama_on_Bronchial_Asthma/links/615187c5522ef665fb61ff12/Effects-of-Pranayama-on-Bronchial-Asthma.pdf#page=102
[16]. Paudyal, P., Jones, C., & Grindey, C. (2018). Meditation for asthma: Systematic review and meta-analysis. *Journal of Asthma*, *55*(7). https://doi.org/10.1080/02770903.2017.1365887
[17]. Pekkanen, J., Lampi, J., & Genuneit, J. (2012, February). Analyzing atopic and non-atopic asthma. *RESPIRATORY EPIDEMIOLOGY*, *27*. https://doi.org/10.1007/s10654-012-9649-y
[18]. Quinto, K. B., Zuraw, B. L., Poon, K.-Y. T., & Chen, W. (2011, November). The association of obesity and asthma severity and control in children. *Journal of Allergy and Clinical Immunology*, *128*(5). https://doi.org/10.1016/j.jaci.2011.06.031
[19]. Saraswati, S. N. (2012). *Gheranda Samhita: commentary on the yoga teachings of maharshi Gheranda*. Yoga Publications trust.
[20]. Subbarao, P., Mandhane, P. J., & Sears, M. R. (2009, oct 27). Asthma: epidemiology, etiology and risk factors. *CMAJ*, *181*(9). https://doi.org/10.1503/cmaj.080612
[21]. Vernon, M. K., Wiklund, I., & Bell, J. A. (2012). What Do We Know about Asthma Triggers? A Review of the Literature. *Journal of Asthma*, *49*(10). https://doi.org/10.3109/02770903.2012.738268
[22]. Wójtowicz, A. M., Wójtowicz, P., & Postek, M. (2011, Dec 21). Asthma as a Psychosomatic Disorder: The Causes, Scale of the Problem, and the Association with Alexithymia and Disease Control. *Advance Respiratory Medicine*, *80*. https://doi.org/10.5603/ARM.27612
[23]. Yadav, P., Jain, P. K., & Sharma, B. S. (2021, Feb 24). Yoga Therapy as an Adjuvant in Management of Asthma. *Indian J Pediatr*, *88*. https://doi.org/10.1007/s12098-021-03675-y
[24]. Yüce, G. E., & Taşcı, S. (2020, February). Effect of pranayama breathing technique on asthma control, pulmonary function, and quality of life: A single-blind, randomised, controlled trial. *Complementary Therapies in Clinical Practice*, *38*. https://doi.org/10.1016/j.ctcp.2019.101081
[25]. Zacharasiewicz, A. (2016). Maternal smoking in pregnancy and its influence on childhood asthma. *European respiratory society*. 10.1183/23120541.00042-2016