International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Effect of Pranayama on Asthma

Aloke Sen Barman

Assistant Professor, Department of Physical Education, Seva Bharati Mahavidyalaya, Kapgari, Jhargram, West Bengal, India
Email: *dralokesenborman[at]gmail.com*

Abstract: ***It is already established that pranayama for patients with chronic obstructive pulmonary disease are to change the activation of respiratory muscles, enhance their function, and lessen dyspnoea. While pranayama has been shown to have favourable short-term physiological effects in individuals with chronic obstructive pulmonary disease such as Asthma is unknown. The researcher reviewed the published papers in PubMed from 1980 to 2025 and tried to elicited mechanism behind effect of pranayama on Asthma. Pranayama may be an option for people with Asthma due to its increased VO2 Max, Lung Capacity, Tidal Volume and Pulmonary Ventilation***.

Keywords: Pranayama, Asthma, Yoga, Effect

1. Introduction

Asthma is increased airflow obstruction and lung hyperinflation brought on by air trapping and a loss of elastic rebound. These physiological alterations are linked to a modified ventilatory muscle recruitment pattern. The auxiliary muscles of ventilation are more active, and the rib cage's musculature contributes more to the movement of the chest wall (Levine 1988; Martinez 1990). Asynchrony between rib cage and abdominal movement, with paradoxical abdominal indrawing during inspiration, may occur when inspiratory muscle exhaustion occurs (Gilmartin 1984). In order to minimize hyperinflation, increase respiratory muscle function, minimize dyspnoea, and maximize thoraco-abdominal motion, breathing exercises try to change the activation of respiratory muscles (Gosselink 2003). Active expiration; pranayama yoga, which consists of timed breathing techniques with an emphasis on expiration; diaphragmatic breathing, also referred to as breathing control or abdominal breathing; pursed lip breathing; and ventilation feedback training, in which participants use computerized feedback to reach personalized goals for respiratory rate and pattern. These methods could lead to immediate increases in ventilation and gas exchange (Breslin 1992; Vitacca 1998). The underlying physiology, the method used, and the training environment can all affect how breathing exercises affect individuals with asthma. While some writers have discovered no physiological markers of response, others have claimed that breathing exercises alleviate dyspnoea in patients who are highly blocked and hyperinflated (Bianchi 2007). pursed lip breathing, which emphasizes passive, extended expiration, may have different benefits than diaphragmatic breathing, which requires vigorous abdominal muscle recruitment. The clinical benefits of breathing exercises during activity may differ from those of training only at rest (Mueller 1970). The best kind of breathing exercises and the patients who benefit from them have not yet been determined. Therefore, the researcher intends to elicited the mechanism behind the effect of pranayama on asthma.

2. Methods

The researcher reviewed the published papers in PubMed from 1980 to 2025 and tried to elicited mechanism behind effect of pranayama on Asthma.

3. Discussion

After removing duplicates, the search yielded 1067 references. 38 entries from 63 papers were obtained for full-text review after records were eliminated based on title and abstract. Following full-text examination, 14 studies were eliminated because they did not satisfy the review criteria. A total of 22 records were suitable for the review. During abdominal breathing, the HbO concentration in the DLPFC of long-term yoga practitioners was noticeably higher than that of short-term practitioners. The higher HbO concentration might result from long-term yoga practitioners improved slow breath control, which improved oxygenation and perfusion. This could be the mechanism behind the benefits of long-term yoga practice in controlling deep abdominal breathing. Improved respiratory regulation has been linked to both emotional and physical well-being in day-to-day living (Stutz and Schreiber, 2017). The effects of mouth breathing at the same respiratory rate and slow nasal breathing were compared by Zaccaro et al. (2022). They examined the effects of mouth breathing at the same respiratory rate versus slow nose breathing. (Zaccaro et al., 2022) demonstrated that slow breathing alters brain activity and, consequently, subjective experience to the extent of causing an unusual state of consciousness. It's also possible that prolonged yoga breathing has a positive effect on DLPFC function due to the elevated HbO concentration in the DLPFC. Planning, organizing, and regulating are the responsibilities of the DLPFC, a region of cognition that is intimately linked to processes including memory, attention, and emotional regulation (Hertrich et al., 2021; Wischnewski et al., 2021) Regular yogic breathing has been shown to improve cognition in numerous studies. Verbal and spatial cognition, memory, sustained attention, and emotional regulation have all been demonstrated to benefit with yogic breathing (Marshall et al., 2014; Ma et al., 2017). The present study offers further neurological proof of the advantages of yogic breathing for cognition.

4. Conclusion

It may be concluded that strengthening respiratory muscles, lowering stress levels, and enhancing oxygen flow, pranayama, or regulated breathing practices, may aid in the management of asthma. Bhastrika (Bellows Breathing) to improve oxygen intake, Kapalbhati to expand lung capacity

and revitalize the body, and Anulom Vilom (Alternate Nostril Breathing) to balance breath and clear airways are all beneficial pranayama techniques for asthma.

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