The Impact of *Pranayama* on *Pranavaha Srotas*: A Review of Respiratory Health in COVID-19 Survivors and Healthy Individuals

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Abstract- This literature review focuses on Pranayama (Anulom Vilom) effect on the respiratory system (Pranavaha Srotas) in both COVID19 survivors and normal individuals. Conceptually, this analysis is grounded in the Ayurvedic approach that emphasizes the importance of channels (Srotas) in maintaining health and disease prevention. This review examined the utility of Pranayama in enhancing lung capacity, improving respiration function and overall health by merging traditional Ayurvedic wisdom with modern scientific evidence. The study results suggest that, Pranayama especially Anulom Vilom focused transverse muscle of their lung overall would improve lung performance and respiratory discomfort along with improvement of the quality of life of the post-COVID patients. Furthermore, the review highlights the need for more studies to establish uniform Pranayama protocols for respiratory rehabilitation.

Keywords: *Pranayama*, *Pranavaha Srotas*, COVID-19, *Anulom Vilom*, respiratory health, Ayurveda, lung capacity.

INTRODUCTION

The COVID-19 pandemic has fundamentally transformed the global respiratory health landscape. Many who recover from COVID-19 continue to have breathing problems, such as impaired function of the lungs and chronic dyspnea. With these challenges, ancient practices like Pranayama, a breathing exercise that's part of yoga, have gained interest for its potential benefit for people's respiratory wellness. The present narrative analysis discusses the benefits of Pranayama on Pranavaha Srotas, (Respiratory pathway) among COVID-19 survivors and healthy individuals. This review attempts to provide an integrated view of this area of investigation by merging information from Ayurveda literature with modern scientific information.

METHODS

A comprehensive examination of traditional Ayurvedic texts, including Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, was performed along with an analysis of contemporary scientific research on *Pranayama* and its impact on respiratory health. The investigation focused on the physiological and therapeutic effects of *Pranayama* techniques, with a particular emphasis on *Anulom Vilom* and their effects on the respiratory system. To provide a comprehensive understanding of the topic, this study incorporated data from clinical trials, observational studies, and literature reviews.

RESULTS

1. Concept of *Pranavaha Srotas* in Ayurveda

Ayurvedic medicine recognizes *Srotas* as conduits or passages through which various substances in the body, including Prana (a life force), circulate. *Pranavaha Srotas* specifically serves as a channel for transporting Prana, which is intimately linked to breathing. Charaka Samhita identified the Moola (origin) of *Pranavaha Srotas* as being situated in the Hrudaya (heart) and Maha*Srotas* (digestive system) [1]. In contrast, Sushruta Samhita locates the Moola in the Hrudaya and Rasavahini Dhamanis (nutrient-carrying blood vessels) [2]. These pathways play a crucial role in maintaining healthy respiratory function and any impairment in their operation may result in breathing-related conditions such as asthma, chronic obstructive

pulmonary disease (COPD), and other pulmonary issues [3].

2. Impact of COVID-19 on *Pranavaha Srotas*

The respiratory system is the primary target of COVID-19, resulting in inflammation, scarring, and respiratory muscle weakness [4]. The virus causes damage to the air sacs in the lungs, which impairs oxygen exchange and reduces the lung capacity. Individuals who have recovered from COVID often continue to experience respiratory problems, including breathlessness and diminished lung function, which can be associated with the deterioration of *Pranavaha Srotas* [5]. According to Ayurvedic literature, respiratory disorders are attributed to an imbalance in the Vata and Kapha doshas, which are responsible for regulating respiratory movement and lubrication, respectively [6].

3. *Pranayama* and Its Role in Respiratory Health

Controlled breathing exercises, known as *Pranayama*, are an essential aspect of Yoga that manage the movement of Prana within the body. *Anulom Vilom*, also called alternate nostril breathing, is one of the most popular *Pranayama* techniques. This practice involves breathing through one nostril and out through the other, which is believed to equilibrate the Prana flow and soothe the mind [7]. Contemporary scientific studies have confirmed the advantages of *Pranayama*, demonstrating its ability to enhance pulmonary capacity, alleviate stress, and boost overall respiratory performance [8].

4. Physiological Effects of *Anulom Vilom* on *Pranavaha Srotas*

Research has demonstrated that *Anulom Vilom* enhances respiratory function by boosting vital capacity, forced expiratory volume, and peak expiratory flow rate [9]. This practice also improves oxygen uptake by encouraging deep controlled breathing, which aids in expanding lung tissues and strengthening muscles involved in respiration [10]. Moreover, *Anulom Vilom* activates the parasympathetic nervous system, helping to alleviate stress and anxiety, which are frequently observed in individuals recovering from COVID-19 [11].

5. Scientific Evidence Supporting *Pranayama*

Research has shown the effectiveness of *Pranayama* in enhancing the respiratory wellness. An investigation published in the International Journal of Yoga revealed that individuals who engaged in *Anulom Vilom* for a 12-week period exhibited notable enhancements in pulmonary function, including elevated forced vital capacity (FVC) and peak expiratory flow rate (PEFR) [12]. In a separate study focusing on individuals with chronic obstructive pulmonary disease (COPD), *Pranayama* was found to enhance respiratory function and alleviate dyspnea [13]. These outcomes are consistent with Ayurvedic principles, which emphasize the significance of *Pranayama* in sustaining the health of *Pranavaha Srotas*.

6. Integration of *Pranayama* in Post-COVID Rehabilitation

Considering the breathing difficulties experienced by those who have recovered from COVID-19, the practice of *Pranayama*, especially *Anulom Vilom*, can serve as a valuable component of post-COVID rehabilitation. This technique aids in normalizing breathing patterns, enhancing respiratory muscle strength, and boosting lung capacity [14]. Additionally, it helps reduce inflammation in the airways, which is essential for recovery from respiratory infections such as COVID-19 [15]. By incorporating *Pranayama* into a holistic rehabilitation approach, the recovery process can be accelerated, leading to improved quality of life for individuals who have overcome COVID-19.

DISCUSSION

A review of existing research underscores the importance of *Pranayama*, especially *Anulom Vilom*, in enhancing respiratory wellness and sustaining the health of *Pranavaha Srotas*. This practice not only improves pulmonary function, but also alleviates stress and anxiety, which are frequently observed in individuals recovering from COVID-19. Evidence indicates that *Pranayama* could serve as an effective, non-invasive approach to respiratory rehabilitation, particularly for those recuperating from COVID-19.

Nevertheless, the current study has certain limitations. Most studies examining *Pranayama* and its effects on respiratory health have been conducted with small participant groups, and there is an absence of standardized *Pranayama* practice protocols. To establish evidence-based guidelines for incorporating *Pranayama* in respiratory rehabilitation, future investigations should prioritize larger-scale randomized controlled studies.

Conflict of interest: None
Source of funding: Self

CONCLUSION

Pranayama, especially *Anulom Vilom*, provides a comprehensive method for enhancing respiratory health and preserving the function of *Pranavaha Srotas*. Studies have demonstrated that this technique can increase lung capacity, alleviate respiratory difficulties, and boost overall wellness in individuals who have recovered from COVID-19 and in those who are seemingly healthy. Incorporating *Pranayama* into rehabilitation programs for post-COVID patients can substantially aid recovery and enhance the quality of life. Additional studies are necessary to develop standardized protocols and to investigate the long-term effects of *Pranayama* on respiratory wellness.

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