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Experiment

The Effect of Nadi Shodhan Yoga on Sinus Symptoms Associated with Hay Fever

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A B S T R A C T

Hay fever, or allergic rhinitis, poses significant challenges globally, impacting individuals with symptoms like sinus issues, sneezing, and nasal congestion. Traditional medical approaches often focus on symptom relief, prompting exploration into holistic alternatives such as Nadi Sodhan (alternate nostril breathing). Grounded in ancient yogic practices, Nadi Sodhan involves rhythmic breathing to harmonize life-force energy. Recognizing a lack of dedicated studies in this area, our research aimed to investigate Nadi Sodhan Yoga’s potential impact on sinus symptoms associated with hay fever. Involving 22 participants, randomly assigned to Nadi Sodhan Yoga or control groups, the study spanned an eight-week intervention using the Rhinoconjunctivitis Quality of Life Questionnaire to assess sinus symptoms. Results revealed a significant reduction in troublesome symptoms, indicating the potential of Nadi Sodhan Yoga in managing hay fever-related sinus issues. The study emphasizes the holistic benefits of intentional breath regulation, offering insights into innovative interventions for allergic rhinitis. Further exploration could deepen our understanding of the intricate link between intentional breath regulation and respiratory health, fostering holistic approaches to related conditions.

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Introduction

The rhythmic dance of breath transcends its role as a physiological necessity; it becomes a foundational pillar for overall health and well-being (Heck et al., 2017). As explored by Noble and Hochman (2019), deliberate, mindful breathing emerges as a powerful tool with profound effects on both the body and the mind. This intentional practice activates the parasympathetic nervous system, initiating a relaxation response that alleviates immediate stress effects and cultivates long-term resilience against its adverse impacts on mental and physical health (Gerritsen & Band, 2018). Moreover, intentional breathing, as highlighted by Zaccaro et al. (2018), optimizes oxygenation throughout the body, supporting optimal cellular function. The interconnectedness of the respiratory and immune systems becomes evident, with intentional breathing aiding in efficiently eliminating toxins and waste products, thereby supporting the body’s natural detoxification processes (Hsia et al., 2013).

Additionally, intentional breathing positively influences circulation, facilitating the transport of
nutrients and the elimination of metabolic by-products (Pittman, 2011). Breathing is a gateway to holistic health, offering transformative effects that foster physical vitality, emotional equilibrium, and mental clarity. In the demanding landscape of modern living, the profound impact of mindful breathing on our journey toward a healthier and more fulfilling life should not be underestimated (Komariah et al., 2022).

Shifting our focus to hay fever, a widespread allergic condition affecting a significant portion of the global population, conventional treatments often centre on symptom relief (Borish, 2003; Dave et al., 2011). However, recent research suggests alternative approaches, such as Nadi Sodhan (alternate nostril breathing), may provide a unique and holistic perspective in managing hay fever (Nair, 2012). Characterized by symptoms like sneezing, nasal congestion, itching, and watery eyes, hay fever significantly impacts an individual’s quality of life. This condition, as explored by Chellaa et al. (2019), results from an immune system overreaction to common environmental allergens like pollen, dust mites, or pet dander, triggering the release of histamines and causing uncomfortable symptoms.

Nadi Sodhan, deeply rooted in ancient yogic traditions, emerges as a potential solution. This pranayama technique involves rhythmic and controlled breathing through alternate nostrils (Jahan et al., 2021). The practice is believed to align the flow of life force energy, or prana, within the body, permeating the entire system through channels known as Nadis, regulating individual cellular activities (Ravindranath, 2014). Nadi, meaning ‘channel’ or the flow of energy, coupled with shodhana, meaning purification, encapsulates a practice designed to purify and harmonize the body. Also referred to as Alternate Nostril Breathing or Anuloma-Viloma Pranayama, Nadi Shodhana not only reduces the effort required for breathing but also strengthens and conditions the diaphragm, enhancing gas exchange and oxygenation (Jahan et al., 2021). Engaging in the Nadi Shodhana practice fosters voluntary control of breathing, encouraging rhythmic respiration and a calm mind. This art of breath control necessitates a sustained focus on breathing, leading to heightened concentration (Zope & Zope, 2013).

Consequently, this heightened awareness serves as a pathway to stress reduction while enhancing pulmonary functions (Parasar et al., 2020). Nadi Shodhana, as a skilful technique, empowers individuals to navigate the intricate interplay between intentional breath regulation, mental serenity, and improved respiratory well-being. Breath is a gateway to holistic well-being (Bhavanani et al., 2013). Incorporating straightforward yet purposeful breathing exercises into daily routines can bring transformative effects, fostering physical vitality, emotional balance, and mental clarity (Zaccaro et al., 2018). Amid the challenges posed by contemporary living, it is crucial not to overlook the profound impact that mindful breathing can have on our journey toward a healthier and more fulfilling life. Shifting the focus to hay fever, a prevalent allergic condition affecting a significant portion of the global population, conventional treatments mainly concentrate on relieving symptoms (Ma et al., 2017). However, an expanding body of research suggests alternative approaches, such as Nadi Sodhan (alternate nostril breathing), offering a rejuvenated and holistic perspective on hay fever management (Chellaa et al., 2019). Characterized by symptoms such as sneezing, nasal congestion, itching, and watery eyes, hay fever significantly influences an individual’s quality of life. Nadi Sodhan, deeply rooted in ancient yogic practices, involves rhythmic and controlled breathing through alternate nostrils to harmonize the body’s flow of life force energy or prana (Malhotra et al., 2022).

Transitioning to the scientific realm, various inquiries suggest a range of vitamins (Bhattacharjee et al., 2024; Bhattacharjee & Pal, 2022), antioxidants (Bhattacharjee, 2020), and botanical compounds (Bhattacharjee, 2023) may be associated with the alleviation of various complications. Building upon these findings, we hypothesize that the practice of Nadi Shodhan Yoga could be linked to the relief of issues arising from hay fever. Notably, the current literature needs more specific studies addressing this correlation. Recognizing this gap, we have initiated a study to explore the potential impact of Nadi Shodhan Yoga on hay fever, as dedicated research has just been undertaken. Our research aims to shed light on the unexplored territory of intentional breath regulation and its potential to offer a holistic approach to hay fever management. In doing so, we hope to contribute to the growing body of knowledge that intertwines ancient wisdom with modern science, paving the way for a new era in holistic well-being.
Objective

This study aims to assess how the regular practice of Nadi Shodhan Yoga impacts sinus symptoms in individuals diagnosed with allergic rhinitis, commonly known as hay fever.

Participants

In this research, we recruited a group of twenty-two individuals aged between 25 and 45, all with a confirmed hay fever diagnosis. Participants were randomly assigned to the Nadi Shodhan Yoga intervention group (n=11) or the control group (n=11). Before initiating the study, we secured informed consent from each participant.

Interposing

Participants in the control group (Group A) did not provide consent to partake in Nadi Shodhan Yoga. In contrast, those in the experimental group (Group B) willingly agreed to engage in Nadi Shodhan practices. The intervention group (Group B) followed a well-organized Nadi Shodhan Yoga program, consisting of 20 minutes of daily practice for eight consecutive weeks, with sessions conducted in both the morning and evening. A yoga instructor with certification generously offered to guide these sessions, guaranteeing participants’ adherence to proper techniques.

Valuation

Initial assessments were conducted for all participants, involving thorough evaluations of sinus symptoms using tools such as the Rhinoconjunctivitis Quality of Life Questionnaire (Brown et al., 2014). Follow-up assessments occurred at the beginning and conclusion of the 8-week intervention period. To evaluate participants’ experiences with sinus symptoms and determine the extent of their distress for each symptom, a series of parameters were presented to them in printed form. These parameters included Head/sinus/tooth tenderness, Face/sinus/tooth pressure, Ear pain, blockage, fullness or stuffiness, Discolored nasal discharge, Postnasal drip, drainage into the throat, Sore or scratch throat, Daytime cough, throat clearing, Poor or absent sense of smell, Foul or off taste or smell, and Flu-like feeling. Participants responded by assigning numerical values, using a scale from 0 to 6, where each number corresponded to the following categories: not troubled, hardly troubled at all, somewhat troubled, moderately troubled, significantly troubled, very troubled, and extremely troubled.

Procedure

Twenty-two individuals suffering from Hay fever and its associated symptoms were selected at the start of the study. The severity of their condition was assessed individually using the “Rhinoconjunctivitis Quality of Life Questionnaire” and documented. To explore the perceived benefits of Nadi Shodhan yoga in an eight-week program, we enrolled all participants, evenly distributing them into two groups. Participants were selected from various areas in Agartala, Tripura, India, and willingly participated in the study by providing consent through consent letters obtained before the research commenced. Before commencing the study, all participants were initially provided with answers to the printed questions. Subsequently, they were equally divided into two groups: Group A served as the control group, with participants not receiving specific instructions to practice Nadi Shodhan yogasana. In contrast, Group B was designated as the experimental group, and participants in this group were encouraged to engage in the yogasana for 56 days, equal to eight weeks, both in the morning and evening, with each session lasting 20 minutes.

Rejection Criteria

Persons with congenital heart disease, epilepsy, recent injuries or immobilization, physical disabilities, and spinal deformities were excluded from participation in the study.

Statistical Analysis Of Data

The mean ± standard deviation (STDEV) represented the data. Statistical analysis utilized appropriate tests to evaluate changes within the two groups, with continuous variables subjected to Student’s t-tests. Adverse effects or participant withdrawals were documented and analyzed. Statistical significance was set at p < 0.05.
RESULTS

Table 1
Troublesome values of sinus symptoms by the participants prior to the onset of yoga intervention

<table>
<thead>
<tr>
<th>Types of sinus symptoms</th>
<th>Problems</th>
<th>Group-A</th>
<th>Group-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Condition</td>
<td>Head/sinus/tooth tenderness</td>
<td>4.71±0.83</td>
<td>4.94±0.73 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Face/sinus/tooth pressure</td>
<td>4.09±0.7</td>
<td>4.08±0.76 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Ear pain, blockage, fullness or stuffiness</td>
<td>3.91±0.94</td>
<td>5.31±0.63 P&lt;0.05</td>
</tr>
<tr>
<td>Nasal &amp; Throat Condition</td>
<td>Discolored nasal discharge</td>
<td>5.18±0.87</td>
<td>4.81±0.48 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Postnasal drip, drainage into the throat</td>
<td>4.97±0.79</td>
<td>4.85±0.8 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Sore or scratched throat</td>
<td>4.64±0.67</td>
<td>4.77±0.6 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Daytime cough, throat clearing</td>
<td>4.82±0.41</td>
<td>5.24±0.52 P&lt;0.05</td>
</tr>
<tr>
<td>Status of Sensibility</td>
<td>Poor or absent sense of smell</td>
<td>5.24±0.51</td>
<td>4.92±0.64 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Foul or off taste or smell</td>
<td>5.09±0.72</td>
<td>4.62±0.51 P&lt;0.05</td>
</tr>
<tr>
<td></td>
<td>Flu-like feeling</td>
<td>4.73±0.79</td>
<td>4.94±0.73 P&lt;0.05</td>
</tr>
</tbody>
</table>

Values are Means ± STDEV. P<0.05 compared with the control group, i.e. group-A, before starting the study. *** indicates p<0.001, ** indicates p<0.01, * indicates p<0.05, and # indicates p>0.05.

Table 1 details troublesome sinus symptoms reported by participants before the commencement of a Nadi Shodhan yoga intervention. These symptoms are classified into various types and mean values with corresponding standard deviations are furnished for two groups, Group A and Group B, based on the participants’ physical condition, nasal and throat condition, and sensibility status. These values reflect the intensity of symptoms, and the designation “P<0.05” denotes statistical significance compared to the control group (Group-A) before the study initiation.

Figure: 1 Physical condition as sinus symptoms after the intervention of Nadi Shodhan Yoga
Values are Means ± STDEV. P was compared with the control group, i.e. group A after the yoga intervention ended. *** indicates p<0.001, ** indicates p<0.01, * indicates p <0.05, and # indicates p>0.05.

The status of three physical conditions as sinus symptoms of the Group-A and Group-B participants are shown in Figure 1 after the intervention of Nadi Shodhan Yoga. Here, we have found that significant (p<0.001) reductions of 73.33%, 70.17%, and 78.18% are noted in the conditions of head/sinus/tooth tenderness, face/sinus/tooth pressure, and ear pain, blockage, fullness or stuffiness symptoms respectively among individuals in Group-B in respect to the individuals in Group-A after the end of the intervention.

Figure 2 Nasal and throat condition as sinus symptoms after the intervention of Nadi Shodhan Yoga

Values are Means ± STDEV. P was compared with the control group, i.e. group A after the yoga intervention ended. *** indicates p<0.001, ** indicates p<0.01, * indicates p <0.05, and # indicates p>0.05.

Figure 2 illustrates the status of four nasal and throat conditions as sinus symptoms in participants from Group A and Group B after the implementation of the Nadi Shodhan Yoga intervention. The findings reveal substantial (p<0.001) reductions of 70%, 57.89%, 55.74%, and 56.25% in the conditions of discoloured nasal discharge, postnasal drip with drainage into the throat, sore or scratch throat, and daytime cough with throat clearing symptoms, respectively, among individuals in Group-B compared to those in Group-A after the intervention.

Figure 3 Status sensibility as sinus symptoms after the intervention of Nadi Shodhan Yoga
Figure 3 depicts the status of sensibility as sinus symptoms in participants from both Group A and Group B following the implementation of the Nadi Shodhan Yoga intervention. The results demonstrate significant (p<0.001) decreases of 74.65%, 77.27%, and 72.73% in the conditions of poor or absent sense of smell, foul or off taste or smell, and flu-like feeling sensations, respectively, among individuals in Group-B as compared to those in Group-A after the intervention.

Discussion

The presented study delves into the potential benefits of Nadi Shodhan Yoga, a traditional yogic breathing practice, on individuals suffering from hay fever. Hay fever, characterized by allergic rhinitis symptoms, significantly impacts the quality of life for affected individuals. Conventional treatments primarily focus on symptom relief, leaving room for exploring alternative approaches. The research builds upon the interconnectedness of intentional breathing practices and their potential impact on respiratory well-being, drawing on the ancient wisdom of yogic traditions.

Table 1 presents the initial status of sinus symptoms in two groups, Group A and Group B, before Nadi Shodhan Yoga for Group B. It quantitatively illustrates the severity of symptoms in each group. The absence of statistical significance (P<0.05) indicates no notable differences between Group B and the control group (Group A) before the study, with both groups reporting nearly the maximum score of 4 in the case of two physical conditions of sinus symptoms that is face/sinus/tooth pressure and ear pain, blockage, fullness or stuffiness problems which indicates they are facing significantly troubled situation. However, in the case of head/sinus/tooth tenderness of physical condition as a sinus symptom, they are given approximately a score of 5, which indicates they are very troubled by this problem. Both the group participants, in case of the nasal and throat conditions as sinus symptoms, values of different problems like discoloured nasal discharge, postnasal drip, drainage into the throat, sore or scratch throat, and daytime cough, throat clearing are given at an average of approximate value five which designates they are facing very troubled conditions. The table also shows the status of their sensitivity before the start of the intervention for Group-B due to hay fever by giving answers in the form of scores of three questions like poor or absent sense of smell, foul or off taste or smell, and flu-like feeling. Here, they are given an average value of almost 5, which means they face very troubled conditions. All this information indicates that sinus symptoms create problems due to hay fever. In their studies, Dykewicz and Hamilos (2010) and Scadding (2008) also reported the same problems as sinus symptoms in rhinitis.

Illustrations of Figure 1 show a significant reduction in physical conditions such as head/sinus/tooth tenderness, face/sinus/tooth pressure, and ear pain, blockage, fullness or stuffiness symptoms among individuals in Group B compared to Group A after the intervention. The scores decreased from approximately 5 to 1, signifying a shift from very troubled conditions to hardly troubled situations for Group B participants. In contrast, Group A participants scored approximately 5, indicating sustained discomfort. This apparent contrast suggests the pronounced potential of Nadi Shodhan Pranayama in alleviating physical conditions associated with sinus symptoms. Abishek et al. (2019) highlighted the enhanced efficacy of incorporating Bhramari pranayama into conventional treatment for chronic rhinosinusitis compared to relying solely on conventional management.

The changes shown in Figure 2 display nasal and throat conditions, representing sinus symptoms such as discoloured nasal discharge, postnasal drip with drainage into the throat, sore or scratched throat, and daytime cough with throat clearing among individuals in Group B as compared to Group A after the intervention. The parameters for all these conditions show a reduction from a score of approximately 5 to 2. This shift indicates a transformation from very troubled conditions to somewhat troubled conditions for participants in Group B. This suggests that Nadi Shodhan Pranayama effectively mitigates the mentioned sinus symptoms. This finding aligns with Kumar et al.’s (2022)
discovery that yoga practice improved various sinus problems caused by COVID-19, providing further support for the benefits of Nadi Shodhana Pranayama in reducing sinus-related issues.

Figure 3 illustrates the changes in nasal and throat conditions, representing sinus symptoms such as poor or absent sense of smell, foul or off taste or smell, and flu-like sensations among individuals in Group B compared to Group A after the intervention. In this figure, all parameters exhibit a reduction from a score of approximately 5 to 1. This transformation signifies a shift from very troubled conditions to hardly troubled conditions for Group-B participants, indicating Nadi Shodhan Pranayama’s efficacy in diminishing the mentioned sinus symptoms. This aligns with findings by Tripathi and Bharadwaj (2021), who documented that yoga can alter responses like smell and taste that are reduced due to rhinitis. Our study is consistent with improving various sinus symptoms through Nadi Shodhan yoga.

The findings of our study demonstrate a noteworthy reduction in troublesome sinus symptoms among individuals practising Nadi Shodhan Yoga compared to the control group. The observed improvements in physical condition, nasal and throat conditions, and sensibility status underscore the potential of intentional breath regulation in alleviating hay fever symptoms. These positive outcomes align with the broader literature on the benefits of intentional breathing on respiratory and immune system functions (Zaccaro et al., 2018; Hsia et al., 2013). The significant reduction in symptoms such as head/sinus/tooth tenderness, face/sinus/tooth pressure, ear pain, blockage, fullness or stuffiness after the Nadi Shodhan Yoga intervention suggests a tangible impact on the physical manifestations of hay fever. This aligns with previous research highlighting the positive effects of intentional breathing on oxygenation and circulation (Jahan et al., 2021; Pittman, 2011). The improvement in nasal and throat conditions, including discoloured nasal discharge, postnasal drip, sore or scratched throat, and daytime cough with throat clearing, further supports the potential efficacy of Nadi Shodhan Yoga in managing hay fever symptoms (Chellaa et al., 2019). Moreover, the observed changes in sensibility status, including poor or absent sense of smell, foul or off taste or smell, and flu-like feeling, indicate a holistic impact on the participants’ well-being. This aligns with the holistic philosophy of yogic traditions, emphasizing the interconnectedness of physical and mental aspects of health (Ravindranath, 2014; Parasar & Dalal, 2020).

Conclusion

The study provides valuable insights into the potential benefits of Nadi Shodhan Yoga as a complementary approach to managing sinus-related problems that occur due to hay fever, offering a holistic perspective beyond conventional treatments. The positive outcomes observed in physical conditions, nasal and throat conditions, and sensibility status underscore the multifaceted impact of intentional breathing on overall well-being. Further research and exploration in this field could contribute to a deeper understanding of the intricate relationship between intentional breath regulation and respiratory health, paving the way for innovative holistic interventions in managing allergic rhinitis and related conditions.

References


