

CHAPTER 6: APPRAISAL

6.1 SUMMARY OF THE FINDINGS

In this prevalence study, we explored the incidence of Allergic Rhinitis (AR) among college students in Vadodara city. A total of 1388 questionnaire forms were received, with 1337 deemed valid for analysis. The study revealed that 19.22% of the participants had AR, aligning with similar prevalence rates reported in other regional studies. A notable 81.32% of students in the AR group were aware of their allergies, yet only 20.23% had undergone testing, with 73.08% reporting positive results. The study further identified house dust and pollen as the most common allergens, along with various environmental triggers. Among the AR symptoms, sneezing was reported as the most bothersome. Furthermore, a significant majority, 82.49%, of students in the AR group experienced a mild to severe negative impact on their academic activities due to AR, highlighting the considerable effect of this condition on student life and performance.

The *Shuddhi Kriya Yoga Program* (SKYP), an eight-week intervention designed for individuals with moderate to severe allergic rhinitis, demonstrated significant positive outcomes. Participants in the SKYP experienced a notable reduction in nasal symptom scores as assessed by the Total Nasal Symptom Score (TNSS), and an enhanced quality of life according to the mini-Rhinoconjunctivitis Quality of Life Questionnaire (mini-RQLQ). A significant improvement in PNIF was observed, indicating the program's effectiveness in improving nasal airway function. However, changes in Peak Expiratory Flow Rate (PEFR) were not statistically significant. The program incorporated *Shat Kriyas* - traditional *Hatha Yoga* cleansing techniques, including *Dhauti*, *Basti*, *Nauli*, *Neti*, *Trataka*, and *Kapalbhati*, which are believed to enhance the benefits of *asanas* and *pranayama* in the management of allergic rhinitis. Beyond the direct impact on nasal symptoms, SKYP's holistic approach, which includes managing stress and enhancing

overall well-being, underscores its potential as a comprehensive treatment strategy for allergic rhinitis. In summary, the SKYP offers a promising alternative or complementary approach to conventional treatments for allergic rhinitis, with evidence supporting its efficacy in reducing symptoms, improving nasal function, and enhancing overall quality of life.

6.2 CONCLUSIONS

In our cross-sectional, population-based study, we found allergic rhinitis (AR) to be a common condition among college students in Vadodara city. Seasonal Allergic Rhinitis (SAR) was more prevalent than Perennial Allergic Rhinitis (PAR). Despite a high awareness of allergic conditions among students, only a minority had undergone allergy testing. The study also revealed that about one-third of the students with AR did not report any comorbidities, while the remaining two-thirds experienced one or more comorbid conditions, with headaches, sinusitis, sleep difficulties, recurrent coughing, and asthma being most common. Significantly, a large proportion of students in the AR group perceived that AR and its associated comorbidities adversely affected their academic activities. These findings underscore the need for public health policies focused on respiratory health, especially considering the high prevalence of AR and its impact on academic performance. The necessity for early diagnosis and the implementation of preventive measures are highlighted by these results. Future research should aim to identify the risk factors for AR among college students, which would further aid in the development of targeted interventions and management strategies.

The *Shuddhi Kriya Yoga Program* (SKYP) emerges as a promising integrative approach to allergic rhinitis management, offering significant improvements in both physical symptoms and overall quality of life. The program, encompassing a unique blend of *Hatha Yoga's Shat Kriyas*, *asanas*, *pranayama*, and relaxation techniques, demonstrated significant efficacy in reducing

nasal symptoms and enhancing the quality of life for individuals with moderate to severe allergic rhinitis. Its emphasis on holistic well-being, stress reduction, and non-invasive healthcare solutions. This study paves the way for further research and potential incorporation of *yoga*-based interventions in the standard treatment protocols for allergic rhinitis.

6.3 IMPLICATION OF THE STUDY

This prevalence study on allergic rhinitis (AR) among college students in Vadodara city has several significant implications. The findings, highlighting AR as a common ailment in this demographic, underscore the necessity for increased awareness and early diagnosis. The prevalence of SAR over PAR, and the limited number of students undergoing allergy testing, point to a gap in health education and access to diagnostic services. Furthermore, the association of AR with comorbidities like headaches, sinusitis, and asthma, and its notable impact on academic performance, emphasize the need for comprehensive healthcare approaches within educational institutions. These insights can inform the development of targeted public health policies and interventions aimed at managing AR, enhancing student well-being, and minimizing the condition's detrimental effects on academic success. The study also paves the way for future research to identify risk factors specific to this population, enabling more effective prevention and management strategies for AR in college settings.

The findings from the study on the *Shuddhi Kriya Yoga Program* (SKYP) for allergic rhinitis have several important implications. The positive outcomes of the SKYP in managing allergic rhinitis symptoms and improving quality of life indicate its potential for integration into mainstream treatment strategies. Healthcare practitioners could consider incorporating *yoga*-based interventions alongside conventional treatments for a more holistic approach. The SKYP offers a non-pharmacological, cost-effective, and accessible option for allergic rhinitis

management. This is particularly relevant for public health strategies aimed at reducing the reliance on medication and promoting holistic well-being. The study's findings could encourage clinicians to explore and recommend *yoga*-based therapies as part of their treatment plans for allergic rhinitis patients, especially for those who prefer alternative or complementary therapies. This study lays the groundwork for future research in the field of *yoga* and its application in treating allergic conditions. It opens avenues for more detailed studies on the mechanisms by which *yoga* affects allergic symptoms and overall health.

6.5 STRENGTH OF THE STUDY

The prevalence study on allergic rhinitis (AR) among college students in Vadodara city boasts several notable strengths. Firstly, the large sample size of the study enhances the reliability and generalizability of the findings to the broader student population. Secondly, the use of the validated SFAR tool for diagnosing AR adds rigor and precision to the identification of allergic conditions among participants. Additionally, the comprehensive assessment of symptoms, comorbidities, and academic impact provides a holistic understanding of AR's effects on students' lives. Furthermore, the inclusion of a diverse student population from various universities within the city ensures a wide representation of demographic and environmental factors. These strengths collectively contribute to the study's robustness and relevance, making it a valuable contribution to the field of public health and allergy research.

The study on the *Shuddhi Kriya Yoga* Program (SKYP) for the management of allergic rhinitis showcases several strengths. The SKYP study stands out for its holistic approach, combining traditional *Hatha Yoga* practices with modern therapeutic needs. This integration addresses both the physical and psychological aspects of allergic rhinitis, offering a comprehensive treatment strategy. The study introduces a unique blend of *Shat Kriyas* with *asanas*, *pranayama*, and

relaxation techniques, providing an innovative approach to managing allergic rhinitis symptoms. The use of quantifiable metrics like Total Nasal Symptom Scores (TNSS), Peak Nasal Inspiratory Flow (PNIF), and the mini-Rhinoconjunctivitis Quality of Life Questionnaire (mini-RQLQ) lends credibility to the study by providing objective evidence of the program's effectiveness. By exploring non-pharmacological interventions, the study addresses the growing interest and need for alternative and complementary therapies in medical practice. The study lays a solid foundation for future research in the field of *yoga* and its therapeutic applications, particularly in allergic and respiratory health.

6.6 LIMITATIONS OF THE STUDY

The present study on allergic rhinitis (AR) among college students in Vadodara city has certain limitations. One significant limitation is the lack of data on conditions such as deviated nasal septum (DNS) and nasal polyps, as well as the status of medication usage among participants. Additionally, the study did not explore the specific impact of AR on various aspects of academic activity, including reading hours, attentiveness, and college attendance. Geographically, the study was confined to a single city, limiting the generalizability of the findings to broader populations. The study's focus on college students meant that the subjects were predominantly adolescents and young adults, which may not represent the full spectrum of AR sufferers. Furthermore, the diagnosis of AR was solely based on self-reported questionnaires without any laboratory tests or documentary proofs, relying entirely on participants' statements. Lastly, the observed high prevalence of AR might be influenced by environmental factors such as the greenery around college campuses leading to increased pollen exposure, an aspect that warrants further investigation in future studies.

The current clinical trial study on the *Shuddhi Kriya Yoga* Program (SKYP) for managing allergic rhinitis, while providing insightful findings, also presents several limitations. The eight-week duration of the *yoga* intervention, though effective in demonstrating immediate impacts, may not suffice to assess long-term effects. An extended trial period would be more ideal to observe sustained outcomes. The relatively small sample sizes in both the experimental and control groups limit the ability to generalize the study's findings to a broader population. Given the nature of the intervention, blinding subjects to the treatment was not feasible, potentially introducing bias into the study results. Conducted in a single center, the study's findings may not be universally applicable to the larger population, especially considering geographical and cultural differences. In India, where *yoga* is widely practiced and positively regarded, participants' pre-existing favorable opinions towards *yoga* might have influenced the outcomes, potentially contributing to a bias. The study did not include the measurement of biomarkers associated with allergic rhinitis, such as cytokines, neurotrophins, pro-inflammatory neuropeptides, IgE levels, and stress hormones. The inclusion of these biomarkers could have provided a more comprehensive assessment of the intervention's impact.

6.7 SUGGESTIONS FOR FUTURE STUDIES

Based on the limitations and findings of this prevalence study on allergic rhinitis (AR) among college students in Vadodara city, several suggestions emerge for future research. Firstly, future studies should consider including a wider geographical area to enhance the generalizability of the findings. Expanding the research to multiple cities or regions would provide a more comprehensive understanding of AR prevalence and its variations across different environments. Secondly, incorporating laboratory tests and clinical assessments into the study design would validate self-reported questionnaire data, leading to more accurate diagnoses of AR. This could

involve allergy tests, nasal examinations for conditions like deviated nasal septum or nasal polyps, and assessments of medication usage. Thirdly, it would be beneficial to investigate the specific effects of AR on academic performance in greater detail. Future studies could explore how AR impacts reading hours, attentiveness in class, college attendance, and overall academic achievement. Additionally, examining the environmental factors, such as the presence of greenery and pollen exposure around educational institutions, could provide valuable insights into potential triggers of AR among college students. Lastly, future research should aim to include a broader age range and a more diverse participant demographic.

Future Studies on the *Shuddhi Kriya Yoga* Program should consider extending the duration of the *yoga* intervention and include long-term follow-up assessments to evaluate the sustainability of the benefits and observe any long-term effects. Research with larger sample sizes and more diverse participant demographics would enhance the generalizability of the findings. This includes varying ages, ethnicities, and severities of allergic rhinitis. Conducting the study across multiple centers would help in understanding the effectiveness of the program in different geographical and cultural contexts. While blinding participants in *yoga* interventions is challenging, future studies should aim for more rigorous randomization methods and consider blinding the assessors to reduce potential bias. Including objective biomarkers such as cytokines, IgE levels, and stress hormones in the assessment would provide a more comprehensive evaluation of the physiological impact of the *yoga* program. Comparing SKYP with other non-pharmacological interventions, such as other forms of exercise or relaxation techniques, could provide insights into its relative effectiveness. Investigating the underlying mechanisms through which *yoga* affects allergic rhinitis symptoms could contribute to a better understanding of its therapeutic potential. Evaluating the cost-effectiveness of SKYP in the management of allergic

rhinitis would be beneficial, especially for healthcare policy and public health strategies. Studies exploring the integration of SKYP with conventional allergic rhinitis treatments could provide a more holistic approach to management.

REFERENCES

- Agnihotri, S., Kant, S., Verma, V. K., Mishra, S. K., & Pandey, S. (2016). Role of jalaneti and pranayama in allergic rhinitis with asthma. *International Journal of Yoga-Philosophy, Psychology and Parapsychology*, 4(1), 3. https://doi.org/10.4103/ijny.ijoyppp_15_15
- Ahmed, Q. R., Sau, S. K., & Kar, S. K. (2010). An evaluation of pulmonary parameters in two groups of subjects during Yoga practice. *Nepal Medical College Journal : NMCJ*, 12(3), 180–182.
- Almadi, T., Cathers, I., & Chow, C. M. (2013). Associations among work-related stress, cortisol, inflammation, and metabolic syndrome. *Psychophysiology*, 50(9), 821-830. <https://doi.org/10.1111/psyp.12069>
- Amizadeh, M., Safizadeh, H., Bazargan, N., & Farrokhdoost, Z. (2013). Survey on the prevalence of allergic rhinitis and its effect on the quality of high school students' life. *Iranian Journal of Otorhinolaryngology*, 25(71), 79–84.
- Annesi-Maesano, I., Didier, A., Klossek, M., Chanal, I., Moreau, D., & Bousquet, J. (2002). The score for allergic rhinitis (SFAR): A simple and valid assessment method in population studies. *Allergy: European Journal of Allergy and Clinical Immunology*, 57(2), 107–114. <https://doi.org/10.1034/j.1398-9995.2002.1o3170.x>
- Arora, S., Guleria, R., Kumar, G., Yadav, S. L., & Mohan, A. (2013). Efficacy of Yoga on Inflammatory Markers, Dyspnea, and Quality of Life in COPD. *Chest*, 144, 787a. <https://doi.org/10.1378/chest.1703685>
- Bauchau, V., & Durham, S. R. (2004). Prevalence and rate of diagnosis of allergic rhinitis in Europe. *European Respiratory Journal*, 24(5), 758-764. <https://doi.org/10.1183/09031936.04.00013904>
- Baraniuk, J. N., & Kim, D. (2007). Nasonasal reflexes, the nasal cycle, and sneeze. *Current allergy and asthma reports*, 7(2), 105-111.
- Berend, N., Salome, C. M., & King, G. G. (2008). Mechanisms of airway hyperresponsiveness in asthma. *Respirology*, 13(5), 624-631. <https://doi.org/10.1111/j.1440-1843.2008.01330.x>
- Bhadra, C., & Chatterjee, K. (2017). Effect of Trataka on blood pressure of college level female students. *Int J Yoga Physiother Phys Edu*, 2(5), 32-4.
- Black, P. H. (2002). Stress and the inflammatory response: a review of neurogenic inflammation. *Brain, behavior, and immunity*, 16(6), 622-653.

[https://doi.org/10.1016/S0889-1591\(02\)00021-1](https://doi.org/10.1016/S0889-1591(02)00021-1)

- Bower, J. E., Greendale, G., Crosswell, A. D., Garet, D., Sternlieb, B., Ganz, P. A., ... & Cole, S. W. (2014). Yoga reduces inflammatory signaling in fatigued breast cancer survivors: a randomized controlled trial. *Psychoneuroendocrinology*, *43*, 20-29. <https://doi.org/10.1016/j.psyneuen.2014.01.019>
- Brożek, J. L., Bousquet, J., Agache, I., Agarwal, A., Bachert, C., Bosnic-Anticevich, S., Schünemann, H. J. (2017). Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines—2016 revision. *Journal of Allergy and Clinical Immunology*, *140*(4), 950–958. <https://doi.org/10.1016/j.jaci.2017.03.050>
- Buske-Kirschbaum, A., Ebrecht, M., & Hellhammer, D. H. (2010). Blunted HPA axis responsiveness to stress in atopic patients is associated with the acuity and severeness of allergic inflammation. *Brain, Behavior, and Immunity*, *24*(8), 1347–1353. <https://doi.org/10.1016/j.bbi.2010.06.013>
- Cahn, B. R., Goodman, M. S., Peterson, C. T., Maturi, R., & Mills, P. J. (2017). Yoga , Meditation and Mind-Body Health : Increased BDNF , Cortisol Awakening Response , and Altered Inflammatory Marker Expression after a 3-Month Yoga and Meditation Retreat, *11*(June), 1–13. <https://doi.org/10.3389/fnhum.2017.00315>
- Caraka. (2017). Chikitsa sthan. In *Charak samhita*.
- Chanta, A., Klaewsongkram, J., Mickleborough, T. D., & Tongtako, W. (2019). Effect of Hatha yoga training on rhinitis symptoms and cytokines in allergic rhinitis patients. *Asian Pacific Journal of Allergy and Immunology*. <https://doi.org/10.12932/ap-260419-0547>
- Cheema, B. S., Houridis, A., Busch, L., Raschke-Cheema, V., Melville, G. W., Marshall, P. W., Colagiuri, B. (2013). Effect of an office worksite-based yoga program on heart rate variability: Outcomes of a randomized controlled trial. *BMC Complementary and Alternative Medicine*, *13*, 1–10. <https://doi.org/10.1186/1472-6882-13-82>
- Chellaa, R., Soumya, M. S., Inbaraj, G., Nayar, R., Saidha, P. K., Menezes, V. H., & Rajeeva, H. N. (2019). Impact of Hatha Yoga on the Airway Resistances in Healthy Individuals and Allergic Rhinitis Patients. *Indian Journal of Otolaryngology and Head and Neck Surgery*, *71*(s3), 1748–1756. <https://doi.org/10.1007/s12070-017-1098-1>
- Chen, J. R., Jin, L., & Li, X. Y. (2014). The effectiveness of nasal saline irrigation (seawater) in treatment of allergic rhinitis in children. *International Journal of Pediatric*

- Otorhinolaryngology*, 78(7), 1115–1118. <https://doi.org/10.1016/j.ijporl.2014.04.026>
- Choi, S. M., Park, J. E., Li, S. S., Jung, H., Zi, M., Kim, T. H., Baoyan, L. (2013). A multicenter, randomized, controlled trial testing the effects of acupuncture on allergic rhinitis. *Allergy: European Journal of Allergy and Clinical Immunology*, 68(3), 365–374. <https://doi.org/10.1111/all.12053>
- Cingi, C., Songu, M., Ural, A., Annesi-Maesano, I., Erdogmus, N., Bal, C., Erkan, A. N. (2011). The score for allergic rhinitis study in Turkey. *American Journal of Rhinology and Allergy*, 25(5), 333–337. <https://doi.org/10.2500/ajra.2011.25.3665>
- Dalhan's Susurut samhita Uttartantra ch-24; <https://niimh.nic.in/ebooks/esushruta/?mod=read>
- Dara, P. K. (2017). Allergic Rhinitis and Bronchial Asthma Comorbidity: A Cross Sectional Questionnaire Study in Children (6-18 Years) of Urban and Rural Jaipur (India). *Journal of Medical Science and Clinical Research*, 5(7). <https://doi.org/10.18535/jmscr/v5i7.18>
- del Cuvillo, A., Santos, V., Montoro, J., Bartra, J., Dávila, I., Ferrer, M., Valero, A. (2017). Allergic rhinitis severity can be assessed using a visual analogue scale in mild, moderate and severe. *Rhinology*, 55(1), 34–38. <https://doi.org/10.4193/Rhino16.025>
- de Vries, J. E. (1995). Immunosuppressive and anti-inflammatory properties of interleukin 10. *Annals of medicine*, 27(5), 537-541.
- Di, R., Lou, X., Ye, L., Miao, J., & Zhao, Y. (2016). Prevalence of allergic rhinitis and its effect on the quality of life of middle school students. *International Journal of Clinical and Experimental Medicine*, 9(8), 15772–15779.
- Dikshit, M. B., Raje, S., & Agrawal, M. J. (2005). Lung functions with spirometry: An Indian perspective-I. Peak expiratory flow rates. *Indian Journal of Physiology and Pharmacology*, 49(1), 8–18.
- DiStasio, S. A. (2008). Integrating yoga into cancer care. *Clinical Journal of Oncology Nursing*, 12(1), 125.
- Downie, S. R., Andersson, M., Rimmer, J., Leuppi, J. D., Xuan, W., Akerlund, A., Salome, C. M. (2004). Symptoms of persistent allergic rhinitis during a full calendar year in house dust mite-sensitive subjects. *Allergy: European Journal of Allergy and Clinical Immunology*, 59(4), 406–414. <https://doi.org/10.1111/j.1398-9995.2003.00420.x>
- Eda, N., Ito, H., & Akama, T. (2020). Beneficial effects of yoga stretching on salivary stress

- hormones and parasympathetic nerve activity. *Journal of Sports Science & Medicine*, 19(4), 695.
- El Hennawi, D. E. D. M., Ahmed, M. R., & Farid, A. M. (2016). Psychological stress and its relationship with persistent allergic rhinitis. *European Archives of Oto-Rhino-Laryngology*, 273(4), 899–904. <https://doi.org/10.1007/s00405-015-3641-6>
- Gaur, S. N., Gupta, K., Rajpal, S., Singh, A. B., & Rohatgi, A. (2006). Prevalence of bronchial asthma and allergic rhinitis among urban and rural adult population of Delhi. *Indian J Allergy Asthma Immunol*, 20(2), 90–97.
- Georgitis, J. W. (1994). Nasal hyperthermia and simple irrigation for perennial rhinitis: Changes in inflammatory mediators. *Chest*, 106(5), 1487–1492. <https://doi.org/10.1378/chest.106.5.1487>
- Gershan, L. A., Durham, P. L., Skidmore, J., Shimizu, J., Cady, R. J., Sheng, X., & Maloney, C. G. (2015). The role of salivary neuropeptides in pediatrics: potential biomarkers for integrated therapies. *European journal of integrative medicine*, 7(4), 372-377.
- Gopal, A., Mondal, S., Gandhi, A., Arora, S., Bhattacharjee, J., Delhi, N., & Delhi, N. (2011). Natural Science - International Journal. *IJOY*, 4(1), 26–36.
- Gopinathan, G., Dhiman, K., & Manjusha, R. (2012). A clinical study to evaluate the efficacy of Trataka Yoga Kriya and eye exercises (non-pharmacological methods) in the management of Timira (Ammetropia and Presbyopia). *AYU (An International Quarterly Journal of Research in Ayurveda)*, 33(4), 543. <https://doi.org/10.4103/0974-8520.110534>
- Gueron, B., Canonica, G., Bousquet, J., Mullol, J., Scadding, G., & Virchow, J. (2007). PRS31 A SURVEY OF THE BURDEN OF ALLERGIC RHINITIS IN EUROPE. *Value in Health*. [https://doi.org/10.1016/s1098-3015\(10\)66528-x](https://doi.org/10.1016/s1098-3015(10)66528-x)
- Hellings, P. W., & Fokkens, W. J. (2006). Allergic rhinitis and its impact on otorhinolaryngology. *Allergy: European Journal of Allergy and Clinical Immunology*. <https://doi.org/10.1111/j.1398-9995.2006.01109.x>
- Holmström, M., Rosén, G., & Wåhlander, L. (1997). Effect of nasal lavage on nasal symptoms and physiology in wood industry workers. *Rhinology*, 35(3), 108–112.
- Jagannathan, A., Raghuram, N., & Talwadkar, S. (2014). Effect of trataka on cognitive functions in the elderly. *International Journal of Yoga*, 7(2), 96. <https://doi.org/10.4103/0973->

[6131.133872](https://doi.org/10.1016/j.jallergy.2000.06.006)

- Juniper, & Ferrie. (2000). Development and validation of the mini Rhinoconjunctivitis Quality of Life Questionnaire. *clinical & Experimental allergy*, 30(1), 132-140. <https://doi.org/10.1046/j.1365-2222.2000.00668.x>
- Kakaje, A., Alhalabi, M. M., Alyousbashi, A., Hamid, A., & Hosam Aldeen, O. (2020). Allergic Rhinitis and Its Epidemiological Distribution in Syria: A High Prevalence and Additional Risks in War Time. *BioMed Research International*, 2020, 1-9. <https://doi.org/10.1155/2020/7212037>
- Kamei, T., Toriumi, Y., Kimura, H., Kumano, H., Ohno, S., & Kimura, K. (2000). Decrease in Serum Cortisol during Yoga Exercise is Correlated with Alpha Wave Activation. *Perceptual and Motor Skills*, 90(3), 1027–1032. <https://doi.org/10.2466/pms.2000.90.3.1027>
- Kant, S., Kumar, S., Mishra, R., Mishra, S., & Agnihotri, S. (2014). Impact of yoga on biochemical profile of asthmatics: A randomized controlled study. *International Journal of Yoga*, 7(1), 17. <https://doi.org/10.4103/0973-6131.123473>
- Khattab, K., Khattab, A. A., Ortak, J., Richardt, G., & Bonnemeier, H. (2007). Iyengar yoga increases cardiac parasympathetic nervous modulation among healthy yoga practitioners. *Evidence-Based Complementary and Alternative Medicine*, 4, 511-517.
- Kekan, D. R. (2013). Effect of Kapalbhathi Pranayama on Body Mass Index and Abdominal Skinfold Thickness. *Alternative Medicine*, (November), 424–426.
- Kekan, D., & Shriniwas, K. (2013). Original Article Effect of Kapalbhathi Pranayama on Waist and Hip. *Journal of Evolution of Medical and Dental Science*, 2(11), 1696.
- Kiecolt-Glaser, J. K., Heffner, K. L., Glaser, R., Malarkey, W. B., Porter, K., Atkinson, C., Marshall, G. D. (2009). How stress and anxiety can alter immediate and late phase skin test responses in allergic rhinitis. *Psychoneuroendocrinology*, 34(5), 670–680. <https://doi.org/10.1016/j.psyneuen.2008.11.010>
- Kim, D., & Baraniuk, J. N. (2007). Neural aspects of allergic rhinitis. *Current Opinion in Otolaryngology and Head and Neck Surgery*. <https://doi.org/10.1097/MOO.0b013e328259c372>
- Klossek, J. M., Lebreton, J. P., Delagranda, A., & Dufour, X. (2009). PNIF measurement in a healthy french population. A prospective study about 234 patients. *Rhinology*.

<https://doi.org/10.4193/Rhin08.083>

- Lamb, C. E., Ratner, P. H., Johnson, C. E., Ambegaonkar, A. J., Joshi, A. V., Day, D., Eng, B. (2006). Economic impact of workplace productivity losses due to allergic rhinitis compared with select medical conditions in the United States from an employer perspective. *Current Medical Research and Opinion*, 22(6), 1203–1210. <https://doi.org/10.1185/030079906X112552>
- Leynaert, B., Neukirch, F., Demoly, P., & Bousquet, J. (2000). Epidemiologic evidence for asthma and rhinitis comorbidity. *Journal of Allergy and Clinical Immunology*, 106(5 SUPPL.), 1–5. <https://doi.org/10.1067/mai.2000.110151>
- Lee, M., Moon, W., & Kim, J. (2014). Effect of yoga on pain, brain-derived neurotrophic factor, and serotonin in premenopausal women with chronic low back pain. *Evidence-Based Complementary and Alternative Medicine*, 2014.
- Mandhane, S. N., Shah, J. H., & Thennati, R. (2011). Allergic rhinitis: An update on disease, present treatments and future prospects. *International Immunopharmacology*. <https://doi.org/10.1016/j.intimp.2011.07.005>
- Marnell, L., Mold, C., & Du Clos, T. W. (2005). C-reactive protein: Ligands, receptors and role in inflammation. *Clinical Immunology*. <https://doi.org/10.1016/j.clim.2005.08.004>
- Martelli, D., McKinley, M. J., & McAllen, R. M. (2014). The cholinergic anti-inflammatory pathway: a critical review. *Autonomic Neuroscience*, 182, 65-69.
- Mashyal, P., Raghuram, N., & Bhargav, H. (2014). Safety and usefulness of Laghu shankha prakshalana in patients with essential hypertension: A self controlled clinical study. *Journal of Ayurveda and Integrative Medicine*, 5(4), 227. <https://doi.org/10.4103/0975-9476.131724>
- Meera, S., Vandana Rani, M., Sreedhar, C., & Robin, D. T. (2020). A review on the therapeutic effects of Neti Kriya with special reference to Jala Neti. *Journal of Ayurveda and Integrative Medicine*, 11(2), 185–189. <https://doi.org/10.1016/j.jaim.2018.06.006>
- Meltzer, E. O., Blaiss, M. S., Derebery, M. J., Mahr, T. A., Gordon, B. R., Sheth, K. K., . & Boyle, J. M. (2009). Burden of allergic rhinitis: results from the Pediatric Allergies in America survey. *Journal of Allergy and Clinical Immunology*, 124(3), S43-S70. <https://doi.org/10.1016/j.jaci.2009.05.013>
- Meltzer, E. O., & Bukstein, D. A. (2011). The economic impact of allergic rhinitis and current

- guidelines for treatment. *Annals of Allergy, Asthma & Immunology*, 106(2), S12-S16. <https://doi.org/10.1016/j.anai.2010.10.014>
- Michalsen, A., Grossman, P., Acil, A., Langhorst, J., Lütke, R., Esch, T., Dobos, G. J. (2005). Rapid stress reduction and anxiolysis among distressed women as a consequence of a three-month intensive yoga program. *Medical Science Monitor*, 11(12).
- Min, Y. G. (2010). The pathophysiology, diagnosis and treatment of allergic rhinitis. *Allergy, Asthma and Immunology Research*, 2(2), 65–76. <https://doi.org/10.4168/aa.2010.2.2.65>
- Moghadasi, M., & Najafi, P. (2017). The effect of yoga training on enhancement of Adrenocorticotrophic hormone (ACTH) and cortisol levels in female patients with multiple sclerosis. *Complementary Therapies in Clinical Practice*, 26, 21–25. <https://doi.org/10.1016/j.ctcp.2016.11.006>
- Mourya, M., Mahajan, A. S., Singh, N. P., & Jain, A. K. (2009). Effect of Slow- and Fast-Breathing Exercises on Autonomic Functions in Patients with Essential Hypertension. *The Journal of Alternative and Complementary Medicine*, 15(7), 711–717. <https://doi.org/10.1089/acm.2008.0609>
- Mueller, R. S. (2013). Allergen-specific immunotherapy. *Veterinary allergy*, 85-89. <https://doi.org/10.1002/9781118738818.ch12>
- Muktibodhananda S. (2006). *Hatha yoga pradipika*. Yoga Publications Trust, Munger, Bihar, India.
- Muralikrishnan, K., Balakrishnan, B., Balasubramanian, K., & Visnegarawla, F. (2012). Measurement of the effect of Isha Yoga on cardiac autonomic nervous system using short-term heart rate variability. *Journal of Ayurveda and Integrative medicine*, 3(2), 91.
- Naclerio, R. M. (1997). Pathophysiology of perennial allergic rhinitis. *Allergy*, 52(36 Suppl), 7–13. <https://doi.org/10.1111/j.1398-9995.1997.tb04816.x>
- Nagarathna, R. (1985). Yoga for bronchial asthma. *British Medical Journal (Clinical Research Ed.)*, 291(6507), 1507. <https://doi.org/10.1136/bmj.291.6507.1507-a>
- Nagendra, H. R., & Nagarathna, R. (1986). An integrated approach of yoga therapy for bronchial asthma: a 3-54-month prospective study. *The Journal of Asthma : Official Journal of the Association for the Care of Asthma*, 23, 123–137. <https://doi.org/10.3109/02770908609077486>
- Nathan, R. A. (2007). The burden of allergic rhinitis. *Allergy and Asthma Proceedings*, 28(1), 3–

9. <https://doi.org/10.2500/aap.2007.28.2934>

- Ng, M. L. S., Warlow, R. S., Chrishanthan, N., Ellis, C., & Walls, R. S. (2000). Preliminary criteria for the definition of allergic rhinitis: a systematic evaluation of clinical parameters in a disease cohort (II). *Clinical & Experimental Allergy*, 30(10), 1417-1422.
- Okubo, K., Kurono, Y., Ichimura, K., Enomoto, T., Okamoto, Y., Kawauchi, H., Masuyama, K. (2020). Japanese guidelines for allergic rhinitis 2017. *Allergology International*, 66(2), 205–219. <https://doi.org/10.1016/j.alit.2016.11.001>
- Pal, G. K., & Velkumary, S. (2004). Effect of short-term practice of breathing exercises on autonomic functions in normal human volunteers. *Indian Journal of Medical Research*, 120(2), 115.
- Papsin, B., & McTavish, A. (2003). Saline nasal irrigation. Its role as an adjunct treatment. *Canadian Family Physician*, 49(FEB.), 168–173.
- Patra, S. (2017). Physiological Effect of Kriyas: Cleansing Techniques. *International Journal of Yoga*, 5(1), 3–5. <https://doi.org/10.4103/ijny.ijoyppp>
- Paul, R., Bagri, P., Mondal, J., Basu, R. (2014). Study on Prevalence of Allergic Rhinitis in a Sample Population from Eastern India using the Score for Allergic Rhinitis (SFAR) technique. *Asian Journal of Pharmaceutival and Health Science*, 4(2), 1016–1019.
- Pavlov, V. A., Wang, H., Czura, C. J., Friedman, S. G., & Tracey, K. J. (2003). The cholinergic anti-inflammatory pathway: a missing link in neuroimmunomodulation. *Molecular medicine*, 9(5), 125-134.
- Powell, N. D., Tarr, A. J., & Sheridan, J. F. (2013). Psychosocial stress and inflammation in cancer. *Brain, behavior, and immunity*, 30, S41-S47. <https://doi.org/10.1016/j.bbi.2012.06.015>
- Pradhan, B. (2013). Effect of kapalabhati on performance of six-letter cancellation and digit letter substitution task in adults. *International Journal of Yoga*, 6(2), 128. <https://doi.org/10.4103/0973-6131.113415>
- Principi, N., & Esposito, S. (2017). Nasal irrigation: An imprecisely defined medical procedure. *International Journal of Environmental Research and Public Health*, 14(5). <https://doi.org/10.3390/ijerph14050516>
- Pullen, P. R., Nagamia, S. H., Mehta, P. K., Thompson, W. R., Benardot, D., Hammoud, R.,

- Khan, B. V. (2008). Effects of Yoga on Inflammation and Exercise Capacity in Patients With Chronic Heart Failure. *Journal of Cardiac Failure*, 14(5), 407–413. <https://doi.org/10.1016/j.cardfail.2007.12.007>
- Rabone, S. J., & Saraswati, S. B. (1999). Acceptance and effects of nasal lavage in volunteer woodworkers. *Occupational Medicine*, 49(6), 365–369. <https://doi.org/10.1093/occmed/49.6.365>
- Raghavendra, B. R., & Singh, P. (2016). Immediate effect of yogic visual concentration on cognitive performance. *Journal of Traditional and Complementary Medicine*, 6(1), 34–36. <https://doi.org/10.1016/j.jtcme.2014.11.030>
- Raghavendra, B., & Ramamurthy, V. (2014). Changes in heart rate variability following yogic visual concentration (Trataka). *Heart India*, 2(1), 15. <https://doi.org/10.4103/2321-449X.127975>
- Raghavendra, R. M., Vadiraja, H. S., Nagarathna, R., Nagendra, H. R., Rekha, M., Vanitha, N., Kumar, V. (2009). Effects of a Yoga program on cortisol rhythm and mood states in early breast cancer patients undergoing adjuvant radiotherapy: A randomized controlled trial. *Integrative Cancer Therapies*, 8(1), 37–46. <https://doi.org/10.1177/1534735409331456>
- Raghuraj, P., Ramakrishnan, A. G., Nagendra, H. R., & Telles, S. (1998). Effect of two selected yogic breathing techniques on heart rate variability. *Indian Journal of Physiology and Pharmacology*, 42(4), 467–472.
- Ramalingam, K. K., & Smith, M. C. F. (1990). Simple treatment for snoring also a means of prediction of uvulopalatopharyngoplasty success? *Journal of Laryngology and Otology*, 104(5), 428–429. <https://doi.org/10.1017/S0022215100158633>
- Rosa, A. C., & Fantozzi, R. (2013). The role of histamine in neurogenic inflammation. *British journal of pharmacology*, 170(1), 38-45.
- Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: a review of comparison studies. *The journal of alternative and complementary medicine*, 16(1), 3-12. <https://doi.org/10.1089/acm.2009.0044>
- Sankar, J., & Das, R. R. (2018). Asthma – A Disease of How We Breathe: Role of Breathing Exercises and Pranayam. *Indian Journal of Pediatrics*. <https://doi.org/10.1007/s12098-017-2519-6>
- Sarubin, N., Nothdurfter, C., Schüle, C., Lieb, M., Uhr, M., Born, C., Baghai, T. C. (2014). The

- influence of Hatha yoga as an add-on treatment in major depression on hypothalamic-pituitary-adrenal-axis activity: A randomized trial. *Journal of Psychiatric Research*, 53(1), 76–83. <https://doi.org/10.1016/j.jpsychires.2014.02.022>
- Schatz, M. (2007). A survey of the burden of allergic rhinitis in the USA. *Allergy: European Journal of Allergy and Clinical Immunology*. <https://doi.org/10.1111/j.1398-9995.2007.01548.x>
- Sears, M. R., Burrows, B., Flannery, E. M., Herbison, G. P., Hewitt, C. J., & Holdaway, M. D. (1991). Relation between airway responsiveness and serum ige in children with asthma and in apparently normal children. *New England Journal of Medicine*. <https://doi.org/10.1056/NEJM199110103251504>
- Settipane, R. A., & Charnock, D. R. (2007). Epidemiology of rhinitis: allergic and nonallergic. *Clinical allergy and immunology*, 19, 23-34.
- Sheikh, A., Harris, J., Khan-Wasti, S., Fletcher, M., Cullinan, P., & Walker, S. (2007). Seasonal allergic rhinitis is associated with a detrimental effect on examination performance in United Kingdom teenagers: Case-control study. *Journal of Allergy and Clinical Immunology*, 120(2), 381–387. <https://doi.org/10.1016/j.jaci.2007.03.034>
- Shirsa Chandra vasu (1979) *Gherand samhita*, (ssp edition), Sri Satguru Publication, Delhi 110007
- Saraswati, S. N. (2012). *Gheranda samhita*. *Yoga Publication Trust, Munger, Bihar, India*, 32, 81.
- Skoner, D. P. (2001). Allergic rhinitis: Definition, epidemiology, pathophysiology, detection, and diagnosis. *Journal of Allergy and Clinical Immunology*, 108(1 SUPPL.), 2–8. <https://doi.org/10.1067/mai.2001.115569>
- Solé, D., Filho, N. A. R., Sarinho, E. S., Camelo-Nunes, I. C., Barreto, B. A. P., Medeiros, M. L., Andrade, C. (2015). Prevalence of asthma and allergic diseases in adolescents: Nine-year follow-up study (2003-2012). *Jornal de Pediatria*, 91(1), 30–35. <https://doi.org/10.1016/j.jpmed.2014.05.002>
- Streeter, C. C., Jensen, J. E., Perlmutter, R. M., Cabral, H. J., Tian, H., Terhune, D. B., Renshaw, P. F. (2007). Yoga Asana Sessions Increase Brain GABA Levels: A Pilot Study. *The Journal of Alternative and Complementary Medicine*, 13(4), 419–426. <https://doi.org/10.1089/acm.2007.6338>

- Streeter, C. C., Whitfield, T. H., Owen, L., Rein, T., Karri, S. K., Yakhkind, A., & Jensen, J. E. (2010). Effects of yoga versus walking on mood, anxiety, and brain GABA levels: a randomized controlled MRS study. *The journal of alternative and complementary medicine*, 16(11), 1145-1152. <https://doi.org/10.1089/acm.2010.0007>
- Streeter, C., Gerbarg, P. L., Nielsen, G. H., Brown, R. P., Jensen, J. E., Silveri, M., & Streeter, C. C. (2018). Effects of Yoga on Thalamic Gamma-Aminobutyric Acid, Mood and Depression: Analysis of Two Randomized Controlled Trials. *Neuropsychiatry*, 8(6), 1923–1939. <https://doi.org/10.4172/Neuropsychiatry.1000535>
- Swami Digambar, D. G. M. L. (1978). *Gherand Samhita, Kaivalydhama, Lonavala*.
- Swami Muktibodhananda. (1998). *Hatha Yoga Pradipika*. Yoga Publications Trust, Munger, Bihar, India.
- Tan, R. A., & Corren, J. (2011). The relationship of rhinitis and asthma, sinusitis, food allergy, and eczema. *Immunology and Allergy Clinics*, 31(3), 481-491. <https://doi.org/10.1016/j.iac.2011.05.010>
- Taneja, D. K. (2014). Yoga and health. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, 39(2), 68.
- Tai, C. F., & Baraniuk, J. N. (2002). Upper airway neurogenic mechanisms. *Current opinion in allergy and clinical immunology*, 2(1), 11-19.
- Tano, L., & Tano, K. (2004). A daily nasal spray with saline prevents symptoms of rhinitis. *Acta oto-laryngologica*, 124(9), 1059-1062. <https://doi.org/10.1080/00016480410017657>
- Tatar, E. Ç., Sürenoğlu, Ü. A., Özdek, A., Saylam, G., & Korkmaz, H. (2013). The Effect of Combined Medical Treatment on Quality of Life in Persistent Allergic Rhinitis. *Indian Journal of Otolaryngology and Head and Neck Surgery*, 65(SUPPL2), 333–337. <https://doi.org/10.1007/s12070-012-0486-9>
- Tekur, P., Nagarathna, R., Nagendra, H., & Haldavnekar, R. (2014). Effect of yogic colon cleansing (Laghu Sankhaprakshalana Kriya) on pain, spinal flexibility, disability and state anxiety in chronic low back pain. *International Journal of Yoga*, 7(2), 111. <https://doi.org/10.4103/0973-6131.133884>
- Tian, J., Yong, J., Dang, H., & Kaufman, D. L. (2011). Oral GABA treatment downregulates inflammatory responses in a mouse model of rheumatoid arthritis. *Autoimmunity*, 44(6),

- 465–470. <https://doi.org/10.3109/08916934.2011.571223>
- Tiwari, K. K., Shaik, R., Aparna, B., & Brundavanam, R. (2018). A Comparative Study on the Effects of Vintage Nonpharmacological Techniques in Reducing Myopia (Bates eye exercise therapy vs.Trataka Yoga Kriya). *International Journal of Yoga, 11*(1), 72–76. https://doi.org/10.4103/ijoy.IJOY_59_16
- Togias, A. (2000). Unique mechanistic features of allergic rhinitis. *Journal of Allergy and Clinical Immunology, 105*(6 II), S599–S604. <https://doi.org/10.1067/mai.2000.106885>
- Tomooka, L. T., Murphy, C., & Davidson, T. M. (2000). Clinical study and literature review of nasal irrigation. *The Laryngoscope, 110*(7), 1189–1193. <https://doi.org/10.1097/00005537-200007000-00023>
- Varshney, J., & Varshney, H. (2015). Allergic rhinitis: An overview. *Indian Journal of Otolaryngology and Head and Neck Surgery, 67*(2), 143–149. <https://doi.org/10.1007/s12070-015-0828-5>
- Vedamurthachar, A., Janakiramaiah, N., Hegde, J. M., Shetty, T. K., Subbakrishna, D. K., Sureshbabu, S. V., & Gangadhar, B. N. (2006). Antidepressant efficacy and hormonal effects of Sudarshana Kriya Yoga (SKY) in alcohol dependent individuals. *Journal of Affective Disorders, 94*(1–3), 249–253. <https://doi.org/10.1016/j.jad.2006.04.025>
- Vera, F. M., Manzanque, J. M., Maldonado, E. F., Carranque, G. A., Rodriguez, F. M., Blanca, M. J., & Morell, M. (2009). Subjective Sleep Quality and hormonal modulation in long-term yoga practitioners. *Biological Psychology, 81*(3), 164–168. <https://doi.org/10.1016/j.biopsycho.2009.03.008>
- Wang, F., & Szabo, A. (2020). Effects of yoga on stress among healthy adults: A systematic review. *Alternative Therapies in Health and Medicine, 26*(4), 58–64.
- Yadav, R. K., Magan, D., Mehta, N., Sharma, R., & Mahapatra, S. C. (2012). Efficacy of a Short-Term Yoga-Based Lifestyle Intervention in Reducing Stress and Inflammation: Preliminary Results. *The Journal of Alternative and Complementary Medicine, 18*(7), 662–667. <https://doi.org/10.1089/acm.2011.0265>
- Yokusoglu, M., Ozturk, S., Uzun, M., Baysan, O., Demirkol, S., Caliskaner, Z., Isik, E. (2007). Heart rate variability in patients with allergic rhinitis. *Military Medicine, 172*, 98–101. <https://doi.org/10.7205/MILMED.172.1.98>

APPENDIX–1: INFORMED CONSENT FORM

**Informed Consent form for patients, participating in a randomized control trial to study
“the effect of Shuddhi Kriya based Yoga Program (SKYP) for Allergic Rhinitis”.**

Name of Organization: Swami Vivekananda Yoga AnusandhanaSamsthana (SVYASA)

Name of Program Director: Dr. SubramanyamPailoor

Name of Program: PhD (Yoga)

This Informed Consent Form has two parts:

Information Sheet (to share information about the research with you)

Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full Informed Consent Form

PART I: Information Sheet

Introduction

There may be some words that you do not understand. Please ask us to stop as we go through the information and we will take time to explain. If you have questions later, you can ask them of the investigator, the study doctor or the staff.

Purpose of the research

Allergic rhinitis is very common nowadays making it difficult for the patients to work in their full efficiency during diseased condition it reduces productivity and quality of life. Even being very prevalent in the society it is mostly underdiagnosed till it do not cause other associated problems. There are numbers of methods of alternative medicine to relieve symptoms *yogic* management is being one of them. *Yoga* is more holistic because it has components like *Suddhi Kriyas* (cleansing techniques), *Asana* (physical exercise), *Pranayama* (breathing exercise) and meditation. We are doing this research to find out if yoga is effective for Allergic Rhinitis patients when done properly.

Type of Research Intervention

This research will consist of filling up questionnaires and participating in few clinical tests. You will be taught *yoga* at the *yoga* center 5 days a week for approximately one hour for a total of two months, at the end of which questionnaire and clinical tests will be done once again.

Participant selection

We are inviting all male and female Allergic Rhinitis patients between 18 to 41 years of age and who are willing to participate and who do not have any health risk to intervention.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you receive at this center will continue and nothing will change. If you choose not to participate in this research project, you will be free to choose or go for any kind of treatment you want and we will tell you more about it later. You may change your mind later at any point of research process and stop participating even if you had agreed earlier.

Information on the Trial

In this research, we are testing the effectiveness of *Suddhi Kriya* based *Yoga* program on Allergic Rhinitis. This is commonly used in many Naturopathy and *yoga* centers. Now, we want to test its significance level by this research.

Medicines alone cannot manage Allergic Rhinitis to an expected level. *Yoga* practices based on *Kriyas* gives good results. *Yoga* is an age old practice, which is being followed in India for thousands of years. It includes physical exercises called *Asana*, cleansing techniques called *Kriyas*, breathing exercises called *Pranayama* and meditation called *Dhyana*. Along with these, the *yoga* module used in this research also includes relaxation, lecture sessions and counseling. It is absolutely safe if done according to the instructions given by the therapist. You may experience generalized body pain cramps or a catch in the first few days, which is normal and gets all right by itself. Only one or two incidences of severe injuries have been reported, especially in advanced practices and when the protocol was not followed correctly. We know of no other problem or risks.

Some participants in the research will not be given the *yoga* practice which we are testing. Instead, they will only continue to take the medicines that their doctor has prescribed to treat Allergic rhinitis.

Procedures and Protocol

Once your participation in the study is confirmed, some of the simple clinical tests will be performed. You will be asked to answer some questionnaires. Routine measurements like the Blood Pressure, pulse, height, weight, etc. will be taken. A few questions related to your daily activities, stress, sleep etc. would be asked.

Because we do not know if *Kriya* based yoga program will be significantly effective in treating Allergic Rhinitis than taking only medicine, we need to compare the two. To do this, we will put people taking part in this research into two groups. The groups are selected by chance, as if by tossing a coin.

Participants in one group will be given the *yoga* practice along with the medicine prescribed by the physician while participants in the other group will be taking only the medicine as on then required and prescribed by the physician. It is important that neither you nor we know which of the two groups you will be recruited to. The people involved in testing will not know, to which group each one belong to. This information will be in our files, but will not be disclosed until after the research is finished. We will then compare which of the two has the best results. This is the best way we have for testing without being influenced by what we think or hope might happen.

The healthcare workers will be looking after you and the other participants very carefully during the study. If we are concerned about any particular practice, we will identify them and make changes. If there is anything you are concerned about or that is bothering you about the research please talk to the investigator or one of the other health care workers.

B. Description of the Process

During the research you make following visits to the hospital.

- During the first visit, we will give you a few questionnaires about your Nasal symptoms and Quality of life. We will also perform few clinical tests. And we will also ask few questions about general health and measure how tall you are and how much you weigh. And then you will be allotted one of the groups either that with yoga or that without yoga. As explained before, neither you nor we will know whether you go to yoga group or the non-yoga group.
- If you get the yoga group you will have to visit the hospital five times a week for a period of 2 months.

- Irrespective of which group you belong to, after two months, you will come back to the hospital for a repetition of all the tests which were previously mentioned.
- If you are in the non-yoga group, we would offer *yoga* therapy after two months following the completion of the study.
- In total it will take around one hour for all your assessment at baseline (psychological, quality of life, clinical assessment) and at final assessment. Both base line and final assessments will be done at our Hospital, so you need visit hospital two times (baseline and final) for assessments.

Details of Intervention-

- ***Vaman-dhauti-*** Early morning, on empty stomach subject would be asked to drink 4-5 glasses of saline water in squatting position. After which stand up, bend forward, while taking deep breath in stuck your abdomen in and vomit it out by rubbing at base of tongue. When the entire quantity of water comes out, the nausea stops and the feeling to vomit vanishes.
- ***JalaNeti-*** For *jala-neti* practice specialized *neti* pot is used with an extended nose out let. Practitioner is made to stand leaning little forward, neck bending forward laterally towards right side. Then subject is asked to catch the base of *neti* pot in left hand, fix the pot's nozzle to the left nostril. They are asked to open the mouth slightly, breath in & out through mouth only. Water will automatically start flowing through right nostril. After half the water is finished, *neti* pot is to be removed, right nostril to be closed and subject is asked to blow gently from left nostril to wipe out remaining water. After that same practice is to be repeated with other nostril.
- ***Sutra Neti-*** For *Sutra neti* practice subject is made to stand straight, inserting a soft rubber catheter through nose slowly until it comes out of mouth. If subject feels any obstruction procedure will be on hold till the proper opening of nasal pathway it may take 2-3 hour or procedure may be postponed to next day. Forceful insertion of catheter will not be allowed.
- ***Varisaradhauti (laguSankhaPrakshalana)-***It is a yogic method of cleaning entire digestive tract. In this practice, practitioner is made to drink a total of 12- 16 glasses of water to evacuate through bowels. Start with giving 2 glasses of Luke warm saline water and perform five *asanas* in sequence – *tadasana*, *triyakatadasana*, *chakrasana*, *triyakabhujangasana*, and *uddarkarnasana*. The *asanas* are to be repeated after every 2 glasses of water, until there is a feeling to go for evacuation. Similar process is repeated until clear water comes out of anus.

- **KapalBhati-** Forceful exhalation with quick inhalation rapidly like the bellows (of a blacksmith). This is called *Kapalbhati* and it destroys all mucus disorder.(Muktibodhananda S., 2006)

Duration

The research takes place over 2 months in total. During that time, it will be necessary for you to come to the hospital for one hour/5 days per week. At the end of two months, the research will be finished.

Side Effects

As already mentioned, yoga therapy will have no side effects. It can make you tired and it can cause some temporary soreness of the muscles of your body, cramps and muscle catch. It is possible that it may also cause some problems that we are not aware of. However, we will follow you closely and keep track of any unwanted effects or any problems. Or we may stop one or more practices. If anyone had even a minute nose bleeding while practicing especially rubber *neti*, procedure will be stopped we will provide you first aid and refer you to ENT specialist for further opinion. There are chances that you will be dropped out of the study if the situation demands, after discussing with the ENT physician. If this is necessary, we will discuss it together with you and you will always be consulted before we move to the next step.

Risks

By participating in this research it is possible that you will be at greater risk than you would otherwise be. There is a possibility that your symptoms may increase with some of the practices. While the possibility of this happening is very low, you should still be aware of the possibility. We will try to decrease the chances of this event occurring, but if something unexpected happens, we will provide you with first aid. There is, less chances that your disease will not get better because *yoga* therapy is being provided under observation of well qualified *yoga* expert and clinicians. Any other accident or medical conditions during this period, which is not due to the intervention, would not be covered.

Benefits

If you participate in this research, you get a chance of long term follow up from the hospital staff. The *yoga* therapy will be provided free of cost to you. There may not be any benefit to you, but your participation is likely to help us find the answer to the research question. There may not

be any benefit to the society at this stage of the research, but future generations are likely to benefit.

Reimbursements

- You will not be given any money or gifts to take part in this research.
- We would bear cost of all assessment incurring for above tests for research purpose.

Confidentiality

With this research, something out of the ordinary is being done in your community. It is possible that if others in the community are aware that you are participating, they may ask you questions. We will not be sharing the identity of those participating in the research.

The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except the people involved in the research and the research clinician.

Sharing the Results

The knowledge that we get from doing this research will be shared with you through community meetings before it is made widely available to the public. Confidential information will not be shared. There will be small meetings in the community and these will be announced. After these meetings, we will publish the results in order that other interested people may learn from our research.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so and refusing to participate will not affect your treatment at this hospital in any way. You will still have all the benefits that you would otherwise have in this hospital. You may stop participating in the research at any time that you wish without losing any of your rights as a patient here. Your treatment at this hospital will not be affected in any way.

Whom to Contact?

If you have any questions you may ask any one of our team members now or later, even after the study has started. If you wish to ask questions later, you may contact the following person: Dr.Ripudaman Singh chauhan, Telephone no-08141092382 /e-mail- drripudaman84@gmail.com

This proposal has been reviewed and approved by SVYASA IEC as well as the permission has been taken from head of institution of Balwantray Mehta Arogya Bhavan, vadodara. IEC is a committee whose task is to make sure that research participants are protected from harm. If you wish to find about more about the IEC, contact the technical coordinator, IEC- SVYASA, No.19, 'Eknath Bhavan', Gavipuram circle, Kempegoda Nagar, Bangalore- 560019 Telephone number- 08026612669.

You can ask me any more questions about any part of the research study, if you wish to. Do you have any questions?

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Print Name of Participant _____

Signature of Participant _____

Signature of witness (in case illiterate) _____

Date _____

Day/month/year

Statement by the researcher/person taking consent

We have accurately read out the information sheet to the potential participant, and to the best of our ability made sure that the participant understands that the following will be done:

- 1. Baseline assessment.**

2. Final assessment after two months.

We confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of our ability. We confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this ICF has been provided to the participant.

Print Name of Researcher/person taking the consent- Dr. Ripudaman singh

Signature of Researcher /person taking the consent _____

Date _____

Day/month/year

APPENDIX-2: IEC CERTIFICATE



स्वामी विवेकानन्द योग अनुसंधान संस्थान Swami Vivekananda Yoga Anusandhāna Samsthāna

(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)

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RES/IEC-SVYASA/57/2015

June 05, 2015

To,
Dr. Rajesh SK,
Assistant Professor,
Division of Yoga and Physical Science,
S-VYASA University,
Bengaluru.

Reference:

"Effect of Suddhi Kriya based Yoga Program (SKYP) on Allergic Rhinitis - A randomized controlled study". - Committee Approval of the above mentioned study.

Dear Dr. Rajesh SK,

We have received from you the following study related documents vide your letter dated June 05, 2015

1	Project Proposal
2	Informed consent form

Ethics committee meeting was held on **April 25, 2015** between 2:00 PM and 5:00 PM at Eknath Bhavan, Bengaluru. Above documents were examined and discussed in the meeting. After due consideration, the committee has decided to approve conducting the aforementioned study.





स्वामी विवेकानन्द योग अनुसंधान संस्थान

Swami Vivekananda Yoga Anusandhāna Samsthāna

(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)

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This is to confirm that neither Dr. Rajesh SK nor any staff participating in this study were involved in the voting procedures and decision making.

The Institutional Review Board / Institutional Ethics Committee (IEC) are expected to be informed about the progress of the study / any changes in the protocol and patient information / informed consent. The investigators are also expected to submit a copy of the final report to IEC for records.

This approval is valid up to the completion of the study at the site.

Please submit to the IEC, the status report of the study as per the SOPs.

The IEC is organized & operates according to the requirements of ICH-GGP, Indian Council of Medical Research Guidelines & Schedule Y.

Best Wishes,

Subramanya P.

Dr. Subramanya P,
Member Secretary,
Institutional Ethics Committee,
S-VYASA, Bengaluru.

APPENDIX-3: ASSESSMENT TOOLS

For Research Purpose only

Allergic Rhinitis Survey Form (for vadodara college students only)

Name(Optional).....Age/Gender.....
 Mobile No (optional)Institute/College

Standardised questionnaire for SFAR(Symptom score For Allergic Rhinitis) assessment

1. In the past 12 months have you had a problem apart from cold and flu with(Please tick the appropriate cases(s)):

Sneezing - No / Yes; Runny Nose - No / Yes; Blocked Nose - No / Yes

If Yes (at least one problem):

2. In the past 12 months has this nose problem been accompanied by itchy-watery eyes? No / Yes

3. In which season did this nose problem occur?

Winter	<input type="checkbox"/>	spring	<input type="checkbox"/>	Summer	<input type="checkbox"/>	Autumn	<input type="checkbox"/>
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4. what trigger factors provoke or increase your nose problem?

House dust House dust mites Pollens Animal (cat, Dog...)
 Others (please specify) Not Applicable

5. Do you think to be allergic? No / Yes

6. Have you already been tested for allergy (SPT, IgE)? No / Yes

If yes:

6a. What was the result? Positive Negative NA

7. Has a doctor already Diagnosed that you suffer/Suffered from asthma, eczema or allergic rhinitis? No / Yes

8. Is any member of your family suffering from Ashma, eczema or allergic rhinitis? No / Yes

If yes; Who and what disease? (Please tick the appropriate cases(s)):

Father	<input type="checkbox"/>	Asthma	<input type="checkbox"/>	Eczema	<input type="checkbox"/>	Allergic rhinitis	<input type="checkbox"/>
Mother	<input type="checkbox"/>	Asthma	<input type="checkbox"/>	Eczema	<input type="checkbox"/>	Allergic rhinitis	<input type="checkbox"/>
Siblings	<input type="checkbox"/>	Asthma	<input type="checkbox"/>	Eczema	<input type="checkbox"/>	Allergic rhinitis	<input type="checkbox"/>

Total SFAR score = _____

If SFAR score ≥ 7 , Please Answer the following questions

A. What is your major problem (write sequence of major to minor problem out of 3)?

Sneezing, Running nose, Blocked nose

1 2 3

B. Do you have any of the following problem(s) ? if Yes '√' to applicable.

Conjunctivitis	Sinusitis	Recurrent Otitis Media	Etopic dermatitis	Asthma
Headache	constipation	Sleep difficulty	Recurrent coughing	Laryngitis

C. Do you feel that problem of Allergic Rhinitis affects your academic activity? Rate your experience on scale of 0 to 10.

0 1 2 3 4 5 6 7 8 9 10

Scores awarded and distribution of the items in the Score for Allergic Rhinitis (SFAR)

<i>Items /discriminators</i>	<i>Score (points) awarded</i>	<i>Cumulative score</i>
Blocked, runny nose, sneezing in past year	(nasal symptoms) 1 per symptom	3
Months of the year	1 for perennial 1 for pollen season	5
Itchy eyes	2	7
Triggers	Pollens, house dust mites, dust 2 Epithelia (cat, dog) 1	9 (maximum 2)
Perceived allergic status	2	11
Previous positive allergic tests	2	13
Previous medical diagnosis of allergy	1	14
Family history of allergy	2	16
	Total	16



TOTAL NASAL SYMPTOM SCORE

PLEASE ANSWER ALL QUESTIONS TO THE BEST OF YOUR ABILITY. This information will assist us in understanding and treating your symptoms.

1. Please rate how your **nasal congestion** has been over the past: 12 hours Last 2 weeks

None	0 <input type="radio"/>	0 <input type="radio"/>
Mild (symptom clearly present but easily tolerated)	1 <input type="radio"/>	1 <input type="radio"/>
Moderate (symptom bothersome but tolerable)	2 <input type="radio"/>	2 <input type="radio"/>
Severe (symptom difficult to tolerate - interferes with activities)	3 <input type="radio"/>	3 <input type="radio"/>

2. Please rate how your **runny nose** has been over the past: 12 hours Last 2 weeks

None	0 <input type="radio"/>	0 <input type="radio"/>
Mild (symptom clearly present but easily tolerated)	1 <input type="radio"/>	1 <input type="radio"/>
Moderate (symptom bothersome but tolerable)	2 <input type="radio"/>	2 <input type="radio"/>
Severe (symptom difficult to tolerate - interferes with activities)	3 <input type="radio"/>	3 <input type="radio"/>

3. Please rate how your **nasal itching** has been over the past: 12 hours Last 2 weeks

None	0 <input type="radio"/>	0 <input type="radio"/>
Mild (symptom clearly present but easily tolerated)	1 <input type="radio"/>	1 <input type="radio"/>
Moderate (symptom bothersome but tolerable)	2 <input type="radio"/>	2 <input type="radio"/>
Severe (symptom difficult to tolerate - interferes with activities)	3 <input type="radio"/>	3 <input type="radio"/>

4. Please rate how your **sneezing** has been over the past: 12 hours Last 2 weeks

None	0 <input type="radio"/>	0 <input type="radio"/>
Mild (symptom clearly present but easily tolerated)	1 <input type="radio"/>	1 <input type="radio"/>
Moderate (symptom bothersome but tolerable)	2 <input type="radio"/>	2 <input type="radio"/>
Severe (symptom difficult to tolerate - interferes with activities)	3 <input type="radio"/>	3 <input type="radio"/>

5. Please rate how **difficult sleep** has been with nasal symptoms: Last night Last 2 weeks

None	0 <input type="radio"/>	0 <input type="radio"/>
Mild (symptom clearly present but easily tolerated)	1 <input type="radio"/>	1 <input type="radio"/>
Moderate (symptom bothersome but tolerable)	2 <input type="radio"/>	2 <input type="radio"/>
Severe (symptom difficult to tolerate - interferes with activities)	3 <input type="radio"/>	3 <input type="radio"/>

TOTAL SCORE: 0 / 0

MINI RHINOCONJUNCTIVITIS
QUALITY OF LIFE QUESTIONNAIRE
SELF-ADMINISTERED

PATIENT ID _____

DATE _____

Page 1 of 2

Please complete **all** questions by circling the number that best describes how **troubled** you have been during the **last week as a result of your nose/eye symptoms**.

Not troubled Hardly troubled at all Somewhat troubled Moderately troubled Quite a bit troubled Very troubled Extremely troubled

ACTIVITIES

1. REGULAR ACTIVITIES
AT HOME AND AT
WORK
(your occupation or
tasks that you have to
do regularly around
your home and/or
garden)

0 1 2 3 4 5 6

2. RECREATIONAL
ACTIVITIES
(indoor and outdoor
activities with friends
and family, sports,
social activities,
hobbies)

0 1 2 3 4 5 6

3. SLEEP
(difficulties getting a
good night's sleep
and/or getting to sleep
at night)

0 1 2 3 4 5 6

PRACTICAL PROBLEMS

4. NEED TO RUB
NOSE/ EYES

0 1 2 3 4 5 6

5. NEED TO BLOW NOSE
REPEATEDLY

0 1 2 3 4 5 6

MINI RHINOCONJUNCTIVITIS
QUALITY OF LIFE QUESTIONNAIRE
SELF-ADMINISTERED

PATIENT ID _____

DATE _____

Page 2 of 2

How **troubled** have you been during the **last week** as a result of these symptoms?

Not troubled Hardly troubled at all Somewhat troubled Moderately troubled Quite a bit troubled Very troubled Extremely troubled

NOSE SYMPTOMS

6. SNEEZING	0	1	2	3	4	5	6
7. STUFFY/BLOCKED NOSE	0	1	2	3	4	5	6
8. RUNNY NOSE	0	1	2	3	4	5	6

EYE SYMPTOMS

9. ITCHY EYES	0	1	2	3	4	5	6
10. SORE EYES	0	1	2	3	4	5	6
11. WATERY EYES	0	1	2	3	4	5	6

OTHER SYMPTOMS

12. TIREDNESS AND/OR FATIGUE	0	1	2	3	4	5	6
13. THIRST	0	1	2	3	4	5	6
14. FEELING IRRITABLE	0	1	2	3	4	5	6

INSTRUMENTS PICTURES



PEAK EXPIRATORY FLOW RATE METER



PEAK NASAL INFLOW RATE METER

APPENDIX-4 PUBLICATIONS

1. Chauhan, Ripudaman Singh, and S. K. Rajesh. The Role of Yoga Intervention in the Treatment of Allergic Rhinitis: A Narrative Review and Proposed Model. *CELLMED* (2020): 25-1.
2. Chauhan, Ripudamansingh, S. K. Rajesh, and Shweta Chauhan. Prevalence of Allergic Rhinitis and Its Perceived Effect on Academic Activity Among College Students–A Cross-Sectional Study. *National Journal of Community Medicine* 13.4 (2022): 219-223.
3. Chauhan, Ripudaman Singh, and Shweta Chauhan. Effect of Shuddhi Kriya Based Yoga Program (SKYP) for Allergic Rhinitis: A Randomized Control Study. *Journal of Positive School Psychology* (2022): 2616-2626.