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Effect of Yoga Practices on Peak Expiratory Flow Rate and Stress Among Asthmatic Adolescents

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Abstract: Asthma is a chronic inflammatory disorder of the airways that may be caused by a number of different factors, including one's family history, their environment, and their own behaviors. These days, asthma therapies that originate from the yoga community are gaining acceptance across the board as a whole. When it comes to treating asthma, the fundamental objective of yoga is to restore regular breathing patterns and cut down on hyperventilation, which is excessive breathing. Exercises like these may be helpful for those who suffer from asthma because it lower stress, tension, and anxiety; it also stimulate beneficial behavioral changes; it boost immunity; and it build and enhance respiratory muscle endurance. Asthma affects around 300 million individuals throughout the globe, including more than 20 million people in India. Incidence rates of asthma have increased by 50 per cent during the last ten years. India is the third most polluted country in the world due to its average PM2.5 concentration of 51.90, which places it in third place overall. Even though just 12% of city dwellers in India have access to clean air, 18% of youngsters in Chennai have been diagnosed with asthma. The fundamental objective of this research was to establish whether or whether teenagers who suffer from asthma might get advantages from practicing yoga, such as an increase in their Peak Expiratory Flow Rate and a reduction in the amount of stress they experience. For the purpose of this research, thirty male teenagers were selected at random, and they were divided evenly into two groups of fifteen participants each. One group participated in yoga, while the other served as a control. All of the participants were given a test of their Peak Expiratory Flow Rate (PEFR) as well as a stress questionnaire to fill out both before and after the intervention. To assess whether or not there was a significant difference between the two groups on the dependent variables, an analysis of covariance (ANCOVA) was carried out. It is possible to claim that yoga has a significant impact on the physiological and psychological aspects of asthma sufferers in their adolescent years. Yoga has been shown to be beneficial for adolescents who suffer from asthma by increasing their PEFR and lowering their overall stress levels.

Keywords: Yoga, Peak Expiratory Flow Rate, Stress, Asthma, Adolescent

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Introduction

Instability in airflow, obstruction, and exaggerated airway reactions are classic features of asthma, a chronic inflammatory disease of the airways. Symptoms of asthma include rapid breathing, wheezing, chest tightness, difficulty exhaling, breathlessness, and coughing. Smoke, environmental hazards, diseases, hazardous working conditions, cold, smoking, and air pollution all contribute to the problem. Asthma may have several contributing elements, including the natural environment, socioeconomic status, psychological state, and cultural norms and practices. A greater influence is played by environmental variables in underdeveloped countries, such as exposure to allergens, irritants, industrial pollutants, and particulate matter. Air pollution may take many forms; some common examples include benzene, particulate matter, and harmful gases including ozone (O_3), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The prevalence of asthma and other respiratory disorders rises in economically disadvantaged areas.

During an asthma attack, the inner lining of the bronchial tubes swells, obstructing airflow into and out of the lungs. It is not only a feature of kids; it is a trait of individuals of all ages. Asthma is more common in boys than in females among children. However, the gender gap disappears when looking at adult populations. Asthma affects over 300 million individuals throughout the globe, including more than 20 million in India. Over the last decade, the prevalence of asthma has increased by 50 per cent. India has the third highest PM2.5 concentrations globally, averaging 51.90. In Chennai, 18% of kids suffer from asthma, yet just 12% of urban Indians have access to pollution-free air. Medications like Agastya Rasayana and Chyawanprash from the ayurveda tradition, as well as medications like Balavagadam, Amirthasanjeeevi kuligai, Adhathodai chooranam, and Linga mathirai from the siddha tradition, are suggested for this illness. Backbends, breathwork, and hand gestures are central to many Yoga Kriyas. Yoga has been shown to be an effective and low-cost complementary therapy for asthma.

The various causes for the asthma are –(i) dust mites, pollen, cat dander, and other indoor allergens that make their way outside; (ii) allergens found in the outdoors (such as pollen and mold); (iii) nicotine-laced cigarettes; (iv) chemical irritants in the workplace; and (v) ozone pollution.

Extreme cold, Beta-blockers (used to treat high blood pressure, heart issues, and migraine) and other non-steroidal anti-inflammatory medications (such as aspirin) may also trigger asthma attacks. As urbanization has progressed, so has the prevalence of asthma. However, the exact nature of this relationship's meticulousness is still unclear.

The study's objective was to examine the effects of yoga on a variety of physiological and psychological factors, such as Peak Expiratory Flow Rate (PEFR) and stress in teenage asthma sufferers. It was hypothesized that the Yoga Practices group would show significant differences from the control group on the chosen physiological measure, Peak Expiratory Flow Rate (PEFR), and the psychological variable, Stress, among asthmatic teenage males.

Patients who were included in the trial based on their permission were those who had a Peak Expiratory Flow Rate that was less than 70% of peak flow; patients who were on consistent follow-up at the health center; patients who had mild to moderate asthma; and patients who were able to attend for the yoga practice. The following were not included in this study:

- Patients who did not voluntarily commit to observing the terms of the agreement;
- patients suffering from chronic obstructive pulmonary disease; patients with asthma;
- Patients suffering from severe asthmatic attacks who are unable to sit in a comfortable position in order to participate in yoga practice

- Patients who are diagnosed to have co-morbidities were excluded.

Materials and Methods

Sixty patients were brought in, 45 of them were screened, and then 30 adolescent boys with asthma were chosen at random for the purpose of the random group experimental design, using a randomized sampling method from Chennai City. The participants ranged between 13 to 19 years, and they were divided into two groups, A and B, with 15 people in each group. Prior to the beginning of the training program, a primary evaluation of both groups (A and B) was carried out on the specified dependent variables to see how well they were doing. Group A participants participated in yoga therapy sessions lasting one hour each day, six days per week, for a total of eight weeks. The following yoga practices were followed by yoga participants:

Cleansing Techniques:

- JalaNeti
- Kabalabathi

Loosening exercises:

Surya Namaskar

Asanas:

Tadasana, Veera badrasana, Purvatanasana, Vajrasana, Ustrasana, Mahamudra, Salambasarvangasana, Halasana, Bhujangasana, Ardha Uthanasana, Apanasana, Savasana

Breathing exercises/pranayama:

Deep breathing (deep inspiration and deep expiration), Bhastrika (modified), Nadisudhhi, Bhramari, Ujjayi, Omkara (modified) and Yoga Nidra

Participants in Group B, or the Control Group, were allowed to go on with their regular lives and routines during the experiment. No more planning was necessary. Eight weeks later, the same dependent variable was used to compare the two groups again. Peak expiratory flow rate (PEFR) and stress levels were calculated to see how they correlated with the physiological variable of interest.

To evaluate whether or not there were statistically significant differences between the two groups before and after the training session, an analysis of covariance (ANCOVA) was performed, and hypotheses were tested at a level of confidence of 0.05.

Results and Discussion

The data on peak expiratory flow (PEFR) show the effects of yoga therapy in comparison to the pre-test, post-test, and adjusted mean values of the control group shown in Table 1.

A post-test F value of 238.88 was higher than the minimum of 4.20 needed for statistical significance. The F value calculated from the adjusted mean of 539.69 at the 0.05 level was larger than the needed F value of 4.21, indicating a statistically significant difference between the control group and the stress index experimental group (Fig. 1). Table 2 displays the mean pre-, post-, and post-adjusted scores of the control group, together with the findings of the experimental group's Yoga stress study (Fig. 2).

The F value of 119.68, calculated after the fact, was higher than the minimum threshold of 4.20. An analysis of covariance (ANCOVA) revealed a statistically significant difference between the control group and the stress index experimental group, with a F value of 157.61 at the 0.05 level, which is much higher than the needed F value of 4.21. The observations of Nur *et al*. (2020) and Sodhi *et al*. (2009) corroborate the above findings.

Nur *et al*. (2020) studied the effects of pranayama yoga, which emphasizes breath regulation, and endurance conditioning exercise, which emphasizes stamina development, on peak expiratory flow (PEF) in adults with asthma. Pranayama yoga may also help with deepening breathing, fostering healing, and relieving stress, among other advantages. The results demonstrate that those who practiced pranayama yoga had much better asthma control than those

Table 1: Computation of mean and analysis of covariance of peak flow expiratory flow rate of experimental and control group (L/min)

Test	Experimental Group (Yogic Practices)	Control group	Source of variance	Df	Sum of square	Mean square	F
Pre-test mean	237	227	Between	1	750	750	2.55
			Within	28	8230	293.93	
Post-test mean	322	230.67	Between	1	62563.33	62563.333	238.88*
			Within	28	7333.33	261.90	
Adjusted mean	318.13	234.54	Between	1	48031.74	48031.74	539.69*
			Within	27	2402.97	89.00	

* Significant at 0.05 level of confidence. (The table value required for significance at 0.05 with, df 1 and 28 and 1 and 27 are 4.20 and 4.21, respectively)

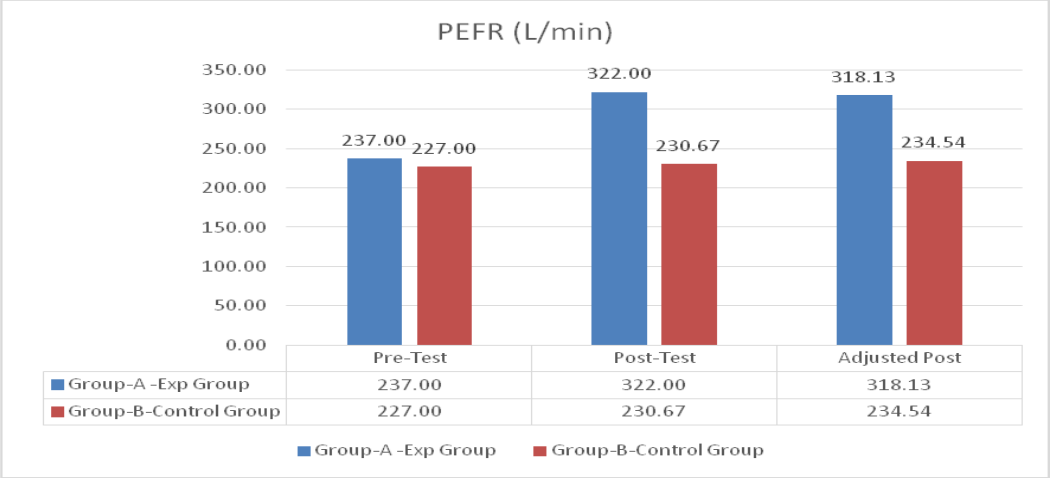

Fig. 1: Mean differences of the control and experimental groups on peak flow expiratory flow rate.

Table 2: Computation of mean and analysis of covariance of stress of experimental and control group (scores)

Test	Experimental Group (Yogic Practices)	Control group	Source of variance	Df	Sum of square	Mean square	F
Pre-test mean	25.67	25.27	Between	1	1.20	1.20	0.13
			Within	28	252.27	9.01	
Post-test mean	15.53	25.53	Between	1	750	750	119.68*
			Within	28	175.47	6.27	
Adjusted mean	15.45	25.62	Between	1	771.40	771.40	157.61*
			Within	27	132.15	4.89	

* Significant at 0.05 level of confidence. (The table value required for significance at 0.05 with, df 1 and 28 and 1 and 27 are 4.20 and 4.21, respectively)

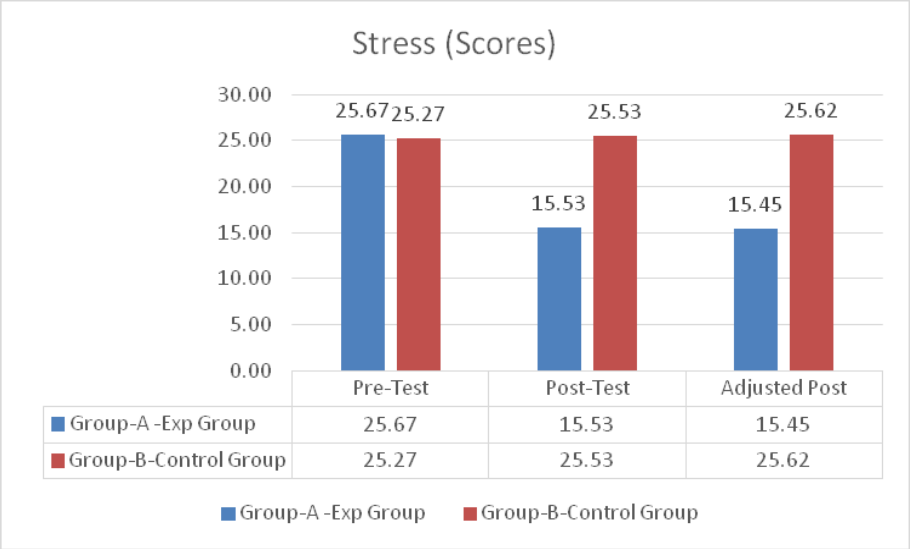

Fig. 2: Mean differences of the control and experimental groups on stress.

who did not. Pranayama yoga and endurance training may be used as an alternative to medication for increasing FPEF and maintaining asthma control.

Sodhi *et al*. (2009) reported effects of yoga on the respiratory systems of people with bronchial asthma These authors reported that when combined with conventional pharmacological therapy, yoga breathing techniques may significantly enhance lung function in bronchial asthma patients.

It was projected that because of Yoga Therapy, there would be significant differences between asthmatic teenage boys and the control group on selected physiological variables such as Peak Expiratory Flow Rate (PEFR) and psychological variables such as Stress. These differences were expected to be improved than those shown in the control group. The findings demonstrated that there were significant changes in Peak Expiratory Flow Rate (PEFR) (increased) and Stress (reduced) due to Yoga Therapy as compared to the control group among asthmatic teenage boys. These differences were caused by Yoga Therapy.

Conclusion

The results of the present study led to the conclusion that adult asthmatic teenage males who practiced yoga had a much lower stress level (Group A) and a significantly higher Peak Expiratory Flow Rate (PEFR) than those in the control group (Group B).

References

Amy JB, Beth Y, David D, Timothy JF and Jill AK. (2012) Yoga training improves quality of life in women with asthma J Alternative Complement Med. 18(8): 749-755.

Das RR, Sankar J and Kabra SK. (2022) Role of breathing exercises in asthma-yoga and pranayama. Indian J Pediatr. 89: 174-180.

Nur A, Kusnanto K, Amin M, Sajidin M, Kurniawati ND and Bakhtiar A. (2020) The Effect of combination pranayama yoga and endurance training exercise on Peak Expiratory Flow (PEF) in adult asthmatic patients. J Keperawatan Padjadjaran 8(2): 137-150.

Sodhi C, Singh S, Dandona PK. (2009) A study of the effect of yoga training on pulmonary functions in patients with bronchial asthma. Indian J Physiol Pharmacol. 53(2): 169-174.