

**EFFECT OF DIFFERENT PRANAYAMA PRACTICES ON FORCED VITAL CAPACITY  
AMONG COLLEGE MEN STUDENTS - A RANDOMIZED CONTROLLED TRIAL****Dr. V. Duraisami<sup>1</sup>, Dr. R. Ramanan\*<sup>2</sup> and Dr. S. Parthasarathy<sup>3</sup>**<sup>1</sup>Assistant Professor, Dept. of Yoga, Tamilnadu Physical. Education and Sports University, Chennai.<sup>2</sup>Assistant Professor, Department of Chest Medicine, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth University, Pillayarkuppam, Puducherry, South India.<sup>3</sup>Professor, Department of Anesthesiology, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth University, Pillayarkuppam, Puducherry, South India.**\*Corresponding Author: Dr. R. Ramanan**

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**ABSTRACT**

Yoga is a traditional Indian method of exercise, which is practiced over thousands of years for keeping the human body physical and mentally fit. Pranayama is one of ancient practice of controlled breathing exercise supposed to better respiratory function in human beings. The purpose of the study was to find out the effect of different pranayama practices on respiratory parameters. To achieve this purpose of the study, thirty various college men students from Chennai were selected as subjects at random. The age of the subjects were ranged from 18 to 21 years. The selected subjects were divided into two equal groups of fifteen subjects each, such as different pranayama practices group and control group. The (Group I) underwent different pranayama practices programme for five days per week for six weeks. Group II acted as control in which they did not undergo any special practice programme. All the subjects of two groups were tested on respiratory parameters at prior to and immediately after the practice programme. The analysis of covariance (ANCOVA) was used to analysis the significant difference, if any in between the groups. The level of significant to test the 'F' ratio obtained by the analyses of covariance was tested at 0.05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between different pranayama practices group and control group on respiratory parameters among college students. A multicentric study with a larger sample may be needed to validate the findings

**KEYWORDS:** Pranayama, Respiratory parameters, Yoga.**INTRODUCTION**

Yogic practices are the described traditional method of Indian exercise, which are practiced over thousands of years for keeping the human body physical and mentally fit. Yoga is an ancient discipline. It has been recognized as a way of attaining ultimate spiritual goals. However, its application in various medical diseases and human physiological parameters is coming up as a new trend. The Sanskrit word pranayama comes from the roots prana (Universal energy), and yama (to control). The literal definition then, is the "control of (or holding onto) the vital force (prana)", aptly via the breath, which makes pranayama in effect, the practice of 'breath control. It is a conscious attempt to stabilize the flows of prana and apana (two primary subtle energies whose dynamic movements are intimately linked to the breath), and bring them into a state of 'polarity' or 'harmonious interaction'. This branch of yoga is often regarded as 'the control of the breath'.<sup>[1]</sup> It is true that on the existential level, the easiest 'perceivable' manifestation of prana, and therefore that upon which it is easiest to act, is

deemed to be the breath. Consequently, the yogi who practices mostly relies on his/her breath for the absorption, assimilation and manipulation of this vital energy. Moreover, prana manifests within beings as the different physical, mental and psychic processes. The fine movements of the nerves in a living body and the powers of the mind are in fact only more specific manifestations of prana. The activity of the five senses are also expressions of prana vibrating at certain frequencies. Since prana is the vital force and yama refers to its control, we can say really that pranayama refers to the 'discipline integrated as a fundamental stage in the yogic practice, which studies the origin and nature of the mysterious and invisible force that is prana'. Innumerable uses of pranayama have been described in literature with differing levels of significance. Still a major role for pranayama remains in the practice of alternative medicine to alleviate the suffering of human beings.<sup>[2,3]</sup>

Respiratory parameters especially forced vital capacity (FVC) is a function of the lungs, which is correlated with the size of your body, particularly your height. It's also a function of your age. As you grow older, your lungs lose elasticity and your chest becomes stiffer. This leaves more air trapped in the lungs, increasing the residual volume, which leads to a gradual decline in respiratory parameters.

The Respiratory parameters may be reduced by a decrease in the amount of functioning lung tissue resulting from atelectasis, edema, fibrosis, pneumonia, pulmonary resection, or tumors; by limited chest expansion resulting from ascites, chest deformity, neuromuscular disease, pneumothorax, or pregnancy; or by airway obstruction.<sup>[4]</sup> But in our study, we are working on young students, who are not having any respiratory illness.

### Statement of the Problem

The purpose of the study was to investigate the effect of different pranayama practices on respiratory parameters among college students.

### Objective of the Study

The objective of the study was to find out the effect of different pranayama practices on respiratory parameters especially FVC (forced vital capacity) among male college students.

It was hypothesized that the effect of different pranayama practices on respiratory parameters among college students during pre and post tests would differ significantly.

### METHODOLOGY

The purpose of the study was to find out the effect of different pranayama practices on respiratory parameters. To achieve this purpose of the study, thirty male students from an university at Chennai were selected as subjects at random. The age of the subjects were ranged from 18

to 21 years. The selected subjects were randomly divided into equal groups of fifteen subjects each. The randomization was done by a sealed envelope technique so that each of the thirty students have an equal chance to be either group. As there was an exercise in the experimental (group I), it's difficult to blind the study. The group I, which did different pranayama practices group underwent different pranayama practices programme for five days per week for six weeks. Group II acted as control in which did not undergo any special training programme apart from their regular programme. All the subjects of two groups were tested on respiratory parameters(FVC) at prior to and immediately after the training programme.

### Experimental Design

The experimental group had undergone respective different pranayama practices programme for five days per week for six weeks. The subjects of two groups were tested during pre and post- test.

### Training Programme

1. Nadi Sodhana
2. Sitali Pranayama
3. Ujjayi Pranayama
4. Kapalabhati Pranayama
5. Bhastrika Pranayama

The analysis of covariance (ANCOVA) was used to analysis the significance in difference, if any in between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at 0.05 level of confidence, which was considered as an appropriate.

### RESULTS

All the students completed the study and there were no drop outs. The analysis of covariance on respiratory parameters of the pre and post test scores of different pranayama practices and control groups have been analyzed and presented in table 1.

**Table 1: Showing Analysis of Covariance of the Data on Respiratory parameters of Pre and Post Test Scores of Different pranayama practices and Control Groups.**

Test	Different pranayama practices Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	'F' ratio
<b>Pre Test</b>							
Mean	3.74	3.76	Between	0.003	1	0.003	0.62
SD	0.06	0.08	Within	0.136	28	0.005	
<b>PostTest</b>							
Mean	3.93	3.75	Between	0.246	1	0.246	56.10*
SD	0.05	0.05	Within	0.123	28	0.004	
<b>Adjusted Post Test</b>							
Mean	3.92	3.76	Between	0.196	1	0.196	256.13*
			Within	0.021	27	0.001	

\*Significant at 0.05 level of confidence

The table value required for significance at 0.05 level of confidence with 1 and 28, 1 and 27 were 4.20 and 4.215 respectively.

Table shows that the pre-test mean of different pranayama practices group and control group are 3.77 and 3.75 respectively. The obtained 'F' ratio of 0.62 for pre- test score was less than the table value Of 4.20 for df 1 and 28 required for significance at 0.05 level of confidence on respiratory parameter, FVC.

The post-test mean of different pranayama practices group and control group are 3.92 and 3.74 respectively. The obtained 'F' ratio of 56.10 for post- test score was greater than the table value Of 4.20 for df 1 and 28 required for significance at 0.05 level of confidence on respiratory parameters.

The adjusted post-test mean of different pranayama practices group and control group are 3.92 and 3.75 respectively. The obtained 'F' ratio of 256.13 for adjusted post- test score was greater than the table value Of 4.215 for df 1 and 27 required for significance at 0.05 level of confidence on FVC. There were no untoward events.

### DISCUSSION

The effect of yogic practices in improving respiratory function has been established in many studies. The improvement shown in FVC after yogic practices has been recently demonstrated in young males.<sup>[5,6]</sup> But in our study, we have shown significant improvement in FVC after pranayama practice. This is also done among young university students. Yogic practices and inclusive games have been shown to improve anxiety<sup>[7,8]</sup> in adult females and found to increase domestic skills in mentally challenged children. Karthik et al have demonstrated that there is a significant improvement in respiratory functions after pranayama. We have singled out a parameter in FVC and clearly showed improvement after pranayama. The different pranayama practice which we clearly explained in the methodology is not done by many of the earlier researchers. Ambareesha Kodam et al<sup>[10]</sup> have demonstrated improvement in lung functions after six weeks of pranayama. This was done in 50 medical students. We have established their findings in different university students with a control group in which where we could not demonstrate the significant betterment of lung function. This study establishes the role of pranayama in lung function, The limitation of our work is the number of sample size and the assessment of a single respiratory parameter.

### CONCLUSION

From the above findings, discussion and within the limitations of the present study, the following conclusion can be drawn. College men students showed significant improvement in the respiratory parameters especially FVC after a systematic pranayama practice of five days a week for six weeks.

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