

Original Research Article

A comparison of lung function in pranayama trained and untrained medical students

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ABSTRACT

Background: Pranayama is a form of breathing exercise. It is a very useful in reducing the weight and improving the respiratory function. The study was designed to assess the effect of pranayama on pulmonary Function among adult male students.

Methods: The control and the study groups each consisted of 50 number of male MBBS students aged between 16 to 22 years, studying at Madras Medical College, were recruited for the present study. The study group were taught pranayama and allowed to practice it daily twice in morning and evening for 15 minutes for 10 weeks under supervision. Parameters like weight, BMI, chest expansion, respiratory rate and spirometric parameters like FVC, FEV1 and PEFR were recorded before and after the study.

Results: A significant increase in chest expansion, FVC, FEV1 and PEFR with p value <0.05 were recorded in study group in comparison with control group.

Conclusions: Pranayama improves the lung function among medical students.

Keywords: Medical students, Pranayama, Spirometric parameters

INTRODUCTION

Pranayama is a form of breathing exercises that regulates the flow of Prana (vital energy) in the body. Short term practice of pranayama has been shown to reduce weight and improve pulmonary function in the form of increased forced vital capacity and breath holding time.¹⁻³

Young adult students are prone to develop exercise induced bronchospasm with reduction in levels of FEV1, FVC, FEV1/FVC ratio.⁴

Pranayama is found to reduce airway reactivity in asthmatics. Hence the present study was designed to compare the lung function of pranayama trained and untrained medical students.

METHODS

The control and the study groups each consisted of 50 numbers of male MBBS student's volunteers with no previous exposure of pranayama training, age ranging from 16 to 22 years, studying at Madras Medical College, Chennai were motivated and recruited for present study. Students with Medical or surgical illness were excluded from the study. After briefing about the study protocol, informal consent was obtained from them.

The study group were taught Surya Nadi bhedhana Pranayama, Chandra Bedhana Pranayama and Nadisodhana Pranayama during the training period of 1 weeks.^{5,6} After the training period, 15 minutes' practice in both morning and evening were held regularly from

Monday to Friday for a total duration of 10 weeks under expert supervision. The students were subjected to following parameters, before and after study period.

Parameters

Anthropometric evaluation

Weight, BMI, chest expansion and respiratory rate were measured.

Spirometry

FVC, FEV1 and PEFr were measured by computerised turbine type spirometer (medspiro). For each parameter, three trials at three minutes' intervals were done and highest of the three values was used for statistical analysis.

Statistical analysis

The data was analysed using student unpaired 't' test. P values of less than 0.05 was accepted as significant.

RESULTS

In present study 50 study participants and 50 control participants were compared with various parameters before and after pranayama session of 10 weeks.

Before study comparison

Study group recorded a mean weight of 53.11 and mean BMI of 22.40 while in control group mean weight of 54.51 and mean BMI of 21.92 were recorded, with no significance ($p > 0.05$) on comparison. Mean respiratory rate (RR) of 18.11 and 17.60 were recorded in study and control groups with no significance on comparison. No significant difference in chest expansion was observed between study and control group with mean value of 6.45 in study group and mean value of 6.12 in control group. FVC were recorded a mean value of 3.74 in study group and 3.88 in control group with no significant difference. Study group were recorded a mean value of FEV1 3.03 and PEFr 399.67 while control group recorded a mean FEV1 3.06 and PEFr 409.00 with both parameters doesn't show a significant difference by comparison between groups (Table 1).

Table 1: Comparison of various parameters between groups before study.

Parameters	Before Study				
	Control group		Study group		P value
	Mean	SD	Mean	SD	
Weight	54.51	12.66	53.11	11.37	0.56
BMI	21.92	2.05	22.40	2.17	0.26
RR /min	17.60	2.01	18.11	1.55	0.16
Chest expansion in cms	6.12	1.71	6.45	1.70	0.34
FVC	3.88	0.35	3.74	0.55	0.13
FEV1	3.06	0.33	3.03	0.79	0.80
PEFR	409.00	74.06	399.67	63.56	0.5

Table 2: Comparison of various parameters between groups after study.

Parameters	After Study				
	Control group		Study group		P value
	Mean	SD	Mean	SD	
Weight	55.34	10.45	52.12	10.32	0.12
BMI	22.07	3.37	21.65	4.03	0.6
RR_/min	16.09	3.6	15.13	2.08	0.1057
Chest expansion * in cms	6.34	1.53	7.33	2.43	0.0166
FVC*	3.65	0.46	4.04	0.78	0.003
FEV1*	2.87	0.24	3.68	0.89	0.001
PEFR*	411.03	52.23	432.11	57.57	0.038

* p value less than 0.05

After study comparison

No significant change was observed in weight, BMI and RR between study group with mean values of 55.34,

22.07 and 16.09 and control group with mean values of 52.12, 21.65 and 15.13 respectively. A significant ($p < 0.05$) difference in chest expansion was observed between study and control groups with mean value of

7.33 in study group and mean value of 6.34 in control group. FVC were recorded a mean value of 4.04 in study group and 3.65 in control group with significant difference. FEV1 and PEFR in study group were recorded a mean value of 3.68 and 432.11 respectively while control group recorded a mean FEV1 2.87 and PEFR 411.03 with both parameters show a significant difference by comparison between groups (Table 2).

DISCUSSION

Both study and control groups don't show a significant difference in all parameters before study. This shows that both groups are similar before study. After the study a significant increase of FEV1, FVC, chest expansion and PEFR in study group were observed in comparison with control group. This may be attributed to increase in the strength and endurance of respiratory muscles following pranayama.⁷ Pranayama also play an important role in reducing the airway resistance, which increases with other modes of exercise. Hence it is not only save mode of exercise for asthmatics but it also improves their lung function.^{4,5} The procedure is so easy to learn and do regularly by everyone irrespective of age.

CONCLUSION

Respiratory muscles are vital and evaluation of their performance is important. Pranayama improves the lung function by increasing Vital capacity and PEFR, which are critical component of good health, in medical students. Hence this study suggests that all medical students along with their busy curriculum as to be trained and encouraged to practice yoga daily to improve their lung function and life pattern. Pranayama can also be safely recommended for people with exercise induced bronchospasm.

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