Effect of Yogic Practices and Aerobic Training on Selected Lung Functions Variables among College Women Athletes

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Abstract

The purpose of the present study was to find out the effect of yogic practices and aerobic training on selected lung functions variables among college women athletes. To achieve the purpose of the study, forty five women athletes form Selvam group of Institutions, Namakkal, Tamil Nadu, were selected as subjects at random and their age ranged from 18 to 25 years. The subjects were divided into three equal groups each group consist of fifteen women athletes. The groups were assigned as experimental group I (yogic practices), experimental group II (aerobic training) and Group III acted as control group. The experimental groups participated their respective training for a period of six weeks. Per and post-tests were conducted on selected lung functions variables such as Vital capacity, Slow vital capacity, Forced vital capacity and Maximum voluntary ventilation. The lung functions variables were measured through standard instrument such as stop watch, spirometre. The collected data were analysed by using the Analysis of covariance (ANCOVA). The results of the study reveal that there was a significant improvement on lung functions variables compared to the control group after the completion of six weeks of yogic practices and aerobic training.

Key words: Yogic practices, Aerobic training, Vital capacity, slow vital capacity, Forced vital capacity and Maximum voluntary ventilation.

Introduction

The literal meaning of the word yoga is yoke. It means for uniting the individual spirit with the universal sprit, or God. The word yoga is derived from the roots of Sanskrit 'Yuj' which to join, to attach, to bind, and yoke and to concentrate on one's attention. The science of yoga works on physical, mental, emotional, psychic and spiritual aspects of a person. When imbalance is experience at this level, the organs, and muscles and nerves no longer functions in harmony, rather they at in opposition to each other. Therefore yoga aims at bringing the different body function into perfect co-ordination. so that they work for the GOD of the whole body. Yoga has a complete massage for humanity. It is a massage for the human body, human mind and human soul (Swami Kuvalayananda, 1977).

Yoga is an art and takes into purview the mind, the body and the soul of the man in its aim of reaching divinity. The body must be purified and strengthened through various practices. The mind must be cleansed of all gross and the soul should turn inwards if a man should become a yogic adept. Study purifies the mind and surrender takes the soul towards God.

Aerobic Training

The word Aerobic literally means 'With oxygen or in the presence of oxygen'. Aerobic exercise are any activity that uses large muscle groups can be maintained continuously for long period of time and is rhythmic in nature. Aerobic activity trains the heart, lungs and cardiovascular system to process and deliver oxygen more quickly and efficiently to every part of the body. As the heart muscle becomes stronger and more efficient. A larger amount of blood can be pumped with oxygen to all parts of the body. Aerobically fit individual can work a quicker recovery if the end of the aerobic session (Douris2012).

Statement of the Problem

The purpose of the study was to find out the effect of yogic practices and aerobic training on selected lung functions variables among college women athletes.

Hypothesis

It was hypothesized that there would be a significant improvement on selected lung functions variables among college women athletes due to yogic practices and aerobic training.

Review of Related Literature

Sandhya T Avadhany, et al. (2014) evaluated the effect of yoga on forced vital capacity (FVC), forced expiratory volume in Ist second (FEV1), peak expiratory flow rate (PEFR), FEVI/FVC ratio, and pulmonary pressures [maximum inspiratory pressure (MIP), maximum expiratory pressure (MEP) at the end of 3 months yoga training and the detraining effect on the above parameters in 7-9-years-old school going children. Materials and Methods: A total of 100 participants were recruited from a school in Bangalore. After baseline assessments, the participants were randomly allocated to either yoga or physical activity group. Intervention was given for 3 months, and measures of pulmonary function and pulmonary pressures were determined immediately post-intervention and at 3-months follow-up. Results: Although significant increase was observed in FVC, FEV1, PEFR, FEV1/FVC, MIP, and MEP at post-intervention, there were no significant differences between the two study groups after adjusting for height and age post training. However, MIP increased significantly in both the groups post-intervention, but the yoga group performed significantly higher than the PE group. The

effects of training did not fade off even after 3 months of detraining. In fact, the FVC and FEV1 continued to increase significantly. A trend of decrease was observed in PEFR, MIP, and MEP. However, the values did not regress to the baseline value. Conclusions: This study suggests that practice of yoga for a short duration (3 months) of time can significantly improve respiratory muscle strength in pediatric population.

De Godoy DV, et al. (2006) conducted a study to clarify whether, in healthy individuals, practicing yoga can modify maximal inspiratory pressure and spirometric indices when compared with the practice of aerobic exercise. A total of 31 healthy volunteers were allocated to practice aerobic exercise (n = 15) or to practice yoga (n = 16). Those in the first group served as controls and engaged in aerobic exercise for 45-60 minutes, twice a week for three months. Those in the second group practiced selected yogic techniques, also in sessions of 45-60 minutes, twice a week for three months. Forced vital capacity, forced expiratory volume in one second and maximal inspiratory pressure were measured before and after the three months of training. No significant alterations were seen in the spirometric indices. A slight, although not significant, improvement in maximal inspiratory pressure was seen in both groups. However, there was a significant difference, seen in both genders, between the absolute delta (final value minus baseline value) of maximal inspiratory pressure for the group practicing yoga and that obtained for the group engaging in aerobic exercise (males: 19.5 cm H2O versus 2.8 cm H2O, p = 0.05; females: 20 cm H2O versus 3.9 cm H2O, p = 0.01). Neither yoga nor aerobic exercise provided a statistically significant improvement in maximal inspiratory pressure after three months. However, the absolute variation in maximal inspiratory pressure was greater among those practicing yoga.

Methodology

To achieve the purpose of the study, forty five college women athletes from Selvam group of Institutions, Namakkal, and TamilNadu were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups each group consist of fifteen women athletes. The groups were assigned as experimental group I (yogic practices), experimental group II (aerobic training) and Group III acted as control group. The experimental groups participated their respective training for a period of six weeks. The following lung functions Variables namely Vital capacity, slow vital capacity, Forced vital capacity and Maximum voluntary ventilations were selected for this study. The above variables were assessed through spirometer. Pre and post data were collected from all the groups. The Analysis of covariance (ANCOVA) was used to find out the significant difference among groups. When the adjusted post-test was significant, the scheffe's post hoc test was used to find out the paired mean differences.

Training Schedule

Yogic Practices

S.No	Asanas	Duration/Frequency
1	**Standing Asanas** Vrikshana Arhachakrasana Trikonasana	30 Mins/3
2	**Sitting Asanas** Vajrasana Pachimottanasanaa Dhanurasana	30 Mins/3
3	**Prone position Asanas** Bhujangasana Salabasana Dhanurasana	30 Mins/3
4	**Supine position Asanas** Halasana Maharasana Bhujangasana	30 Mins/3
5	Makarasana Salabasana Sarvangasana Bhujangasana	30 Mins/3
6	Vrikshasana Arthachakrasana Bhujangasana Salabasana	30 Mins/3

Total work out for 1 hour, 10 minutes for meditation, 40 minutes for Asanas, 10 minutes for pranayama, Weekly three days work out.

Aerobic Training

Week	Monday	Tuesday	Wednesday	Repetition
1 to 2	• Aerobic exercises • Dynamic warmup • Skip jump • Front jump	Aerobic exercises • Kicks • Knee lift and kick • L-step	Aerobic exercises • Step knee lift • Side leaps • Front kick	2 to 4 rep, 3set
3 to 4	• Step knee lifts • Side to side leaps • Across the top	• Knee up t-step • Grape point	• A - step • V – Step • V – Step with	4- 6 rep, 4 set
5 to 6	• A- step • V- step • V- Step with clap	• T- step • V- step • Step touch	• Dynamic warm up • Front kick • Rocking kick	6 to 8 p, 5 set

Results and Discussion

Computation of analysis of covariance on vital capacity, slow vital capacity, forced vital capacity and maximum voluntary ventilation of yogic practices, aerobic training and control groups.

Table – I

Computation of Analysis of Covariance on lung functions Variables

Test	Yogic Group	Aerobic group	Con. Group	SV	SS	df	MS	'F' Ratio
Vital Capacity								
Pre test	1.80	1.79	1.77	BG WG	0.007 1.12	2 42	0.004 0.027	0.13
Post test	2.43	2.36	1.71	BG WG	4.78 1.08	2 42	2.39 0.026	92.37*
Ad. post test	2.43	2.36	1.70	BG WG	4.78 1.08	2 41	2.39 0.026	90.56*
Slow Vital Capacity								
Pre test	1.96	1.95	1.94	BG WG	0.002 0.62	2 42	0.001 0.01	0.07
Post test	2.42	2.57	1.92	BG WG	3.43 2.12	2 42	1.71 0.05	33.97*
Ad. post test	2.42	2.57	1.92	BG WG	3.49 1.99	2 41	1.74 0.04	36.03*
Forced Vital Capacity								
Pre test	1.96	1.94	1.96	BG WG	0.003 0.47	2 42	0.002 0.01	0.15
post test	2 .45	2.49	1.80	BG WG	4.50 1.24	2 42	2.25 0.03	76.11*
Ad. post test	2.45	2.49	1.80	BG WG	4.50 1.24	2 41	2.25 0.03	74.35*
Maximum Voluntary Ventilation								
Pre test	72.00	72.46	71.46	BG WG	12.13 838.66	2 42	6.06 19.96	0.30
Post test	101.60	97.60	72.00	BG WG	7737.60 2327.20	2 42	3863.80 55.41	66.82*
Ad. post test	101.62	97.30	72.26	BG WG	7483.07 2164.49	2 41	3741.53 52.79	70.87*

*Significant at 0.05 level

The above table I indicates the adjusted mean post test values of vital capacity of yogic practices, aerobic training and control groups were 2.43, 2.36 and 1.70 respectively. The obtained F-ratio of 90.56 for adjusted post test mean was greater than the table value 3.22.

Slow vital capacity of yogic training, aerobic training and control group were 2.42, 2.56 and 1.92. The obtained F-ratio of 36.03 for adjusted post test mean was greater than the table value 3.22.

Forced vital capacity of yogic practices, aerobic training and control group were 2.45, 2.49 and 1.80 respectively. The obtained F-ratio of 74.35 for adjusted post test mean was greater than the required table value 3.22.

Maximum voluntary ventilation of yogic practices, aerobic training and control groups were 101.62, 97.30 and 72.26 respectively. The obtained F-ratio of 70.87 for adjusted post test mean was greater than the table value 3.22 for the all degrees of freedom 2 and 41 required for significance at 0.05 level of confidence.

Tables-II

Adjusted mean and differences between the means of yogic practices, aerobic training and control groups

	Yogic Group	Aerobic Group	Control Group	Mean Difference	CI Value
Vital capacity	2.43	2.36	----	0.07	0.13
	2.43	----	1.70	0.73*	
	---	2.36	1.70	0.66*	
Slow vital capacity	2.42	2.57	----	0.15	0.18
	2.42	---	1.92	0.50*	
	---	2.57	1.92	0.65*	
Forced vital capacity	2.45	2.49	---	0.04	0.16
	2.45	---	1.80	0.65*	
	---	2.49	1.80	0.69*	
Maximum voluntary ventilation	101.62	97.30	---	4.32	6.73
	101.62	---	72.26	29.36*	
	---	97.30	72.26	25.04*	

Table-II shows the adjusted means on vital capacity, slow vital capacity, forced vital capacity and maximum voluntary ventilation and difference between the means of the yogic practices, aerobic training and control group. The means differences of yogic practises group and control group were 0.73 and 0.66 respectively was greater than the CI value 0.13.

Hence there was significant difference. The mean difference between yogic practices group and aerobic training group was 0.07 lesser than the CI value 0.13.Hence there was exists no significant difference. Slow vital capacity the mean difference of yogic practices and control group, aerobic training group and control group were 050 and 0.65 respectively was greater than the CI value 0.18 hence there exists significant difference. Forced vital capacity the mean differences of yogic practices group and control group, aerobic training and control group were 0.65 and 0.69 respectively was greater than the CI value 0.16 hence there exists significant difference. The mean difference between yogic practices group and aerobic group was 0.04 lesser than the CI 0.16 Hence there exists no significant difference. Maximum voluntary ventilation the mean difference of yogic practices and control group, aerobic training group and control group were 29.36 and 25.04 respectively was greater than the CI value 6.73 hence there exists significant difference. The mean difference between yogic practices groups and aerobic training group was 4.32 lesser than the CI value 6.73. Hence there was no significant difference between the experimental groups.

Conclusion

1. It was observed that the six weeks of yogic practices have significantly improved the selected lung functions variables such as vital capacity, slow vital capacity, forced vital capacity and maximum voluntary ventilation of women athletes.

2. It was observed that the six weeks of aerobic training have significant improved the selected lung functions variables such as vital capacity, slow vital capacity, forced vital capacity and maximum voluntary ventilation of women athletes.

3. The experimental groups had achieved significant improvement on selected lung functions variables such as vital capacity, slow vital capacity, forced vital capacity and maximum voluntary ventilation of women athletes when compared to control group. Further it shows there was no significant difference between the experimental groups.

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