



Effect of Yoga and Aerobic Exercise on Vital Capacity and Forced Vital Capacity of the Prepuberty School Boys

R.Anista¹ & Dr.P.Sivagnanam²

¹Directress of Physical Education, Wavoo wajeeta Women's College of Arts and Science, Kayalpatnam, Tuticorin, Tamilnadu, India.

²Director of Physical Education, VOC College of Arts and Science, Tuticorin, Tuticorin, Tamilnadu, India.

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Abstract

The purpose of the study was to find out the effect of yoga and aerobic exercise on vital capacity and forced vital capacity of pre puberty school boys. To achieve this purpose of the study has selected 30 school boys on random sampling technique. The selected subjects were divided into three groups namely experimental group I & II, control group III. The training programme was included pre test and post test session over a period of 12 weeks which was considered to be adequate time for the change among selected variables. The training was given for six days in a week. The subjects of yoga, aerobic training and control group were tested on vital capacity and forced vital capacity with wet spirometer. The data were collected from the three groups before and after the experimental period and analysed by the analysis of variance (ANOVA) and analysis of covariance (ANCOVA) to find out the significant difference. The level of significance was fixed at 0.05 levels. If the "F" value for the final test is significant, scheffe's post hoc test was used to find out the significant mean difference between the groups. The experimental groups showed significant improvement on Tidal vital capacity and forced vital capacity than the control group. The aerobic exercise group showed better improvement on vital capacity and forced vital capacity than the yoga group.

Keywords: Aerobic Exercise, Yoga, Tidal Volume, Vital Capacity.

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Introduction

Aerobic exercises require heart and lungs adapt, leading to increases in heart rate as well as breathing rate and depth. During exercise, the lungs must work harder to supply the increased oxygen required by the working muscles as well as exhale increased carbon dioxide. This is accomplished by increasing both the rate and depth of breathing. The tidal volume increases substantially during strenuous exercise from the resting volume of 1/2 liter to as high as 3 liters. This means that each breath in and out moves approximately six times as much air during exercise as during the resting state. It is decreased fatigue and potentially increases in vital capacity, or the maximal amount of air can exhale from the total lung capacity. In yoga, the slower breathe, can longer live. This is more efficient in respiratory rate and we have the more energy. It helps in increasing the Physiological level. The purpose of the study was to find out the effect of pranayama and aerobic exercise on tidal volume and vital capacity of school boys. The researches show the yoga group had significant improvement in lung volume and increased exhalation force, along with improved posture. Their chest wall expansion had increased 38

percent in the upper chest, 19 percent in the mid-chest and 15 percent in the lower chest.

Methodology

To achieve this purpose the investigator has selected 30 school boys on random sampling technique from the School. The selected subjects were divided into three groups namely experimental group I & II and control group III. The training programme including pre test and post test session over a period of 12 weeks which was considered to be adequate time for the changes among selected variable. The training was given for six days in a week. The subjects of Yoga, aerobic training group and control group were tested on vital capacity and forced vital capacity with wet spiro meter. The data were collected from the three groups before and after the experimental period and analysed by the analyses of variance (ANOVA) and analyses of covariance (ANCOVA) to find out the significant difference. The level of significance was fixed at 0.05 levels. If the 'F' value for the final test is significant, scheffe's post hoc test was used to find out the significant mean difference between the groups. The subjects of yoga, aerobic training group and control group were tested for vital capacity and forced vital capacity with the help of wet Spiro meter at Pondicherry Institute of medical Sciences, Kalapet.

Correspondence

R.Anista

E-mail: anistarajagopal@gmail.com, Ph. +9189039 88014

Results and Discussion

Table I. Computation of ANOVA of Experimental group and Control Group of vital Capacity (VC) and Forced Vital Capacity

		Source	Sum of Square	DF	Mean Square	F
Vital Capacity	Initial	Between groups	13166.669	2	6583.333	0.091 ^{NS}
		Within groups	1959250.000	27	72564.815	
	Final	Between groups	2530666.667	2	1265333.333	13.992**
		Within groups	2441750.000	27	90435.185	
Forced Vital Capacity	Initial	Between groups	101946.667	2	50973.333	0.488 ^{NS}
		Within groups	2820200.00	27	104451.852	
	Final	Between groups	2110160.00	2	1055080.000	11.991**
		Within groups	237579.00	27	87992.222	

From the table II, it can be seen that the computed “F” ratio of 0.09 Vital capacity (VC) and 0.488 Forced Vital Capacity (FVC) for the initial test means among the experimental group and control group were insignificant ($P > 0.05$) at 0.05 level of confidence with the degrees of freedom being 1, 27; it clearly indicated that the random assignment of groups were quite successful. Further. It revealed that the calculated “F” ratio of 13.992(VC) and 13.991 (FVC) for the test means among the experimental groups and the control groups were significant ($P > 0.05$) at 0.05 level of confidence with the degrees of freedom being 1, 27. This showed that the treatment of yoga and aerobic practice have made the

significant difference in the mean values among the groups. Hence the ANCOVA technique was employed to find out the difference between the adjusted post test means was significant or not. Subramanian (2001) conducted that there is a significant improvement in aerobic capacity as a result of practice of asanas and practice of asanas along with pranayama and meditation. However, improvement in aerobic as a result of the combined practice asanas, pranayama and meditations is significantly higher than the practice of asanas alone. This may be due to the effect of pranayama and meditations.

Table II. Computation of ANCOVA of Experimental group and Control Group of vital Capacity (VC) and Forced Vital Capacity

	Source	Sum of Square	DF	Mean Square	F
Vital Capacity	Between groups	2214102.486	2	1107051.243	44.759**
	Within groups	643068.075	26	24733.387	
Forced Vital Capacity	Between groups	1194.399	2	1382534.866	35.773**
	Within groups	1583.936	26	502417.143	

As the primary aim of analysis of covariance, the adjusting the initial means with final means and testing there adjusted means was done. “F” ratio obtained (viz table IV) from testing the adjusted means of 44.759(VC) and 35.773(FVC) were high in compare

with the required table f ratio of 3.35 at 0.05 level of confidence with the degrees of freedom being 1,27. Hence the chosen variables for the study is well significant at ($p < 0.05$) at 0.05 level.

Table III. Scheffe’s Post Hoc Test for Mean Difference between groups on Vital capacity and Forced vital capacity

Vital Capacity			Mean Difference	Forced Vital Capacity			Mean Difference
Control Group	Yoga Group	Aerobic Group		Control Group	Yoga Group	Aerobic Group	
1778.612	1664.240	-	114.372	-	1583.936	1706.665	122.729
1778.612	-	1152.148	626.464	1706.665	-	1706.665	512.266
-	1664.240	1152.148	512.092	1706.665	1583.936	-	389.537

Discussions and Finding

The result of the study supported to the pulmonary function variables in favor of Yoga and aerobic exercise training groups. Yoga is the practice of

asana and pranayama with scientific three phases namely puraka (inhalation), Kumbhaka (holding the air in the lungs) and rechaka (exhalation) in a progressive manner works on the breathing mechanism centrally and the

effect spread to the periphery too. Mainly the Lungs, Intercostals muscles, diaphragm and ribs are highly exercised during the Yoga and aerobic exercise. Thus it enhances the Vital capacity and Forced vital capacity among the prepuberty boys significantly. This finding are supported the result of the Birkel D A and Edgren L (2000) Yadav RK and Das S (2001), Joshi L N ,Joshi VD and Gokhale L V (1992).

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