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Effect of yogic training and aerobic training on selected physical and physiological variables among athletes

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Abstract

Purpose: The purpose of the study was to investigate the impact of yogic training and aerobic training on selected Physical and physiological variables among athletes.

Methods: For this study 45 athletes were randomly selected as subjects between the age group of 16-18 years from come and play scheme, Kolkata India. The selected subjects were randomly divided into three equal groups of 15 each, namely yogic practice group (group A), aerobic practice group (group B) and control group (group C). The experimental group had undergone yogic practice and aerobic exercise for eight weeks, five days a week and daily one session only in the morning, duration of session one hour, whereas the control group (group C) maintained their daily routine activities and no special training was given. Physical variable namely flexibility and physiological variable breath holding time were chosen as variables for this study. The subjects of the three groups were tested using standardized tests and procedures on selected physical and physiological variables before and after the training period. The following test items namely sit and reach and breath holding time were used to collect relevant data.

Statistical Analysis: The Analysis of covariance was used for as statistical technique. The level of significance was set as 0.05. Further to see the significance of difference between group means and least significant difference (LSD) Post Hoc test of significance were applied.

Results: The result shows that there was no difference in all the three groups before training but significant differences were found in the two groups after the training. Yogic practice group and aerobic practice group show significant improvement on selected Physical and Physiological variables compared to control groups. These improvements occurred because of planned systematic training. When compared to yogic practice group and aerobic practice group, mean difference showed that significant improvement in yogic practice group on flexibility (1.45) than aerobic exercise group. It was also found that significant improvement in aerobic practice group on Breath holding time (0.90) than yogic practice group.

Keywords: Yogic practice, aerobic exercise, Breath holding time

Introduction

The aim of yoga is to attain perfection of the intellect, both of the head and the heart, so that, the artist becomes devoted, true and pure. This demands an almost total relinquishment of interest in other activities of life except the chosen path. The mind is fluid and runs after sensual pleasures. Art demands total undivided focal attention. Hence Patanjali explains that the mind must be controlled and then submitted to serve the artistic nature of yoga to its highest potency. Yoga or any art requires acute sharpness of intellect and alert organs of perception. In yoga there is no competition but it requires freedom to think and reconstruct with a desire to perform better. Then it brings to the yogi the most exalted enlightenment. From now on, wherever the yogi is and whatever he does, his thoughts are rooted in spiritual communion, which takes him to the Zenith of spiritual life. (B.K.S. Iyengar 1993) [3].

Aerobic exercise uses continuous, rhythmic movement of large muscle groups to strengthen your heart and lungs (cardiovascular system). When you exercise, your muscles demand more oxygen -rich blood. This makes your heart beat faster to keep up. When you follow a program of regular aerobic exercise, your cardiovascular system grows stronger and can meet the muscles' demands without as much effort. In addition, your muscles adapt and become more efficient at performing activity.

Aerobic exercise includes any type of exercise, typically those performed at moderate levels of intensity for extended periods of time that maintains an increased heart rate.

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In such exercise, oxygen is used to "burn" fats and glucose in order to produce adenosine triphosphate, the basic energy carrier for all cells. Initially during aerobic exercise, glycogen is broken down to produce glucose, but in its absence, fat metabolism is initiated instead. The latter is a slow process, and is accompanied by a decline in performance level. The switch to fat as fuel is a major cause of what marathon runners call "hitting the wall." There are various types of aerobic exercise. In general, aerobic exercise is one performed at a moderately high level of intensity over a long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. (Chidambara and Saravanan 2012)^[4].

Regular practice of yoga and aerobics helps to keep our body fit, controls cholesterol level, reduces weight, normalizes blood pressure and improves heart performance. According to the National Institutes of Health, when people actively seek to reduce the stress in their levels by quieting the mind, the body often works to heal itself. In this sense yoga and aerobic can be seen not only as a way to get into shape on several levels, but also as a tool for self- healing. (Yokesh 2011)^[5].

Material and Methods

Forty five athletes from the come and play scheme were selected at random. Their age ranged between 16 and 18. The

selected subjects were randomly divided to three equal groups of 15 each, namely yogic practice group (group A), aerobic practice group (group B) and control group (group C). The yogic practice and aerobic practice were designed in consultation with the experts and were administered for a period of eight weeks, five days a week; a session each day in the morning, session lasted an hour. The yogic practice and aerobic group underwent their respective experimental treatment, whereas the control group maintained their routine activities and no special training was given. Yogic practice consists of asana, pranayama and meditation for experimental group A and selected aerobic training for experimental group B. Flexibility by using sit and reach and breath holding time by using stop watch were selected as physical and physiological variables for this investigation.

Statistical analysis

In order to study the impact of yogic practice and aerobic exercise on selected Physical and physiological variables of athletes. Analysis of covariance (ANCOVA) was applied at 0.05 level of significance. Further to see the significance of difference between group means least significant difference (LSD) Post Hoc test were applied.

Results

Table 1: Ancova of two experimental groups and control group on Flexibility.

Test	Yogic Group (A)	Aerobic Group (B)	Control Group (C)	Source of Variation	Df	SS	MSS	F- ratio
Pre Test Means	12.55	12.34	11.25	A.G.	2	101.47	50.73	2.42
				W.G.	42	880.47	20.96	
Post Test Means	15.35	14.56	11.45	A.G.	2	162.39	81.19	3.85*
				W.G.	42	884.32	21.05	
Adjusted Post Test Means	15.47	14.02	11.64	A.G.	2	42.22	21.11	25.43*
				W.G.	41	34.03	0.83	

F_{0.05} (2,42) = 3.22

F_{0.05} (2,41) = 3.225

The table – I shows that the pre-test mean values on flexibility of yogic practice, aerobic exercise and Control Groups are 12.55, 12.34 and 11.25 respectively. The obtained ‘F’ ratio 2.42 for pre test scores was less than the table values 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on flexibility. The post test means values on flexibility of yogic practice, aerobic practice and control groups are 15.35, 14.56 and 11.45 respectively. The obtained ‘F’ ratio 3.85 for post test score was greater than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on flexibility. The adjusted post test mean

values on flexibility of yogic practice, aerobic exercise and control groups are 15.47, 14.02 and 11.64 respectively. The obtained ‘F’ ratio 25.43 for adjusted post test score was greater than the table value 3.225 for df 2 and 41 required for significance at 0.05 level of confidence on flexibility. The results of the study indicated that there was a significant difference among the adjusted post test means of yogic practice, aerobic exercise and control groups on flexibility. Since the obtained ‘F’ ratio value was significant further to find out the paired mean difference, the (LSD) post hoc test was employed and presented in table – II.

Table 2: Paired adjusted final means and difference between means of three different groups of Flexibility.

Yogic Group (A)	Aerobic Group (B)	Control Group (C)	Mean Difference	Critical Difference
15.47	14.02	.....	1.45*	0.67
15.47	.....	11.64	3.83*	0.67
.....	14.02	11.64	2.38*	0.67

The table II shows that the mean difference values between yogic practice group and aerobic exercise group; yogic practice group and control group & aerobic exercise group and control group are 1.45, 3.83 and 2.38 respectively which are greater than the critical difference value 0.67 at 0.05 level

of confidence. The results of the study showed that there were a significant difference between yogic practice group & aerobic exercise group; yogic practice group & control group and aerobic exercise group & control group on flexibility.

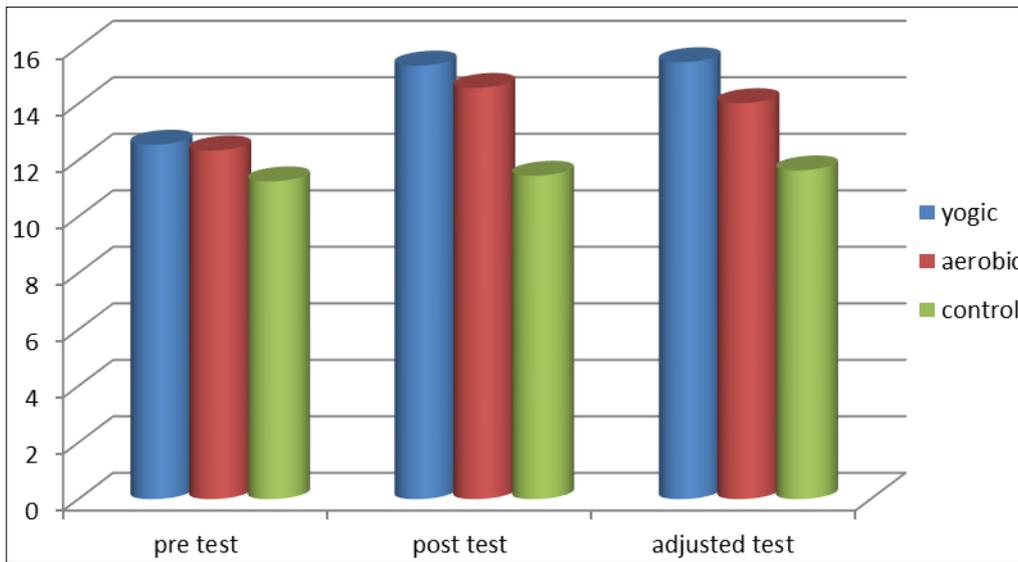


Fig 1: Graphically representation of pre, post and adjusted post test means values of yogic practice group, aerobic practice group and control group on Flexibility in the Figure – I.

Table 3: Ancova of two experimental groups and control group on Breath Holding time.

Test	Yogic Group (A)	Aerobic Group (B)	Control Group (C)	Source of Variation	Df	SS	MSS	F- ratio
Pre Test Means	23.42	23.64	23.37	A.G.	2	56.34	28.17	2.51
				W.G.	42	470.84	11.21	
Post Test Means	28.66	29.52	24.51	A.G.	2	240.52	120.26	8.92*
				W.G.	42	566.47	13.48	
Adjusted Post Test Means	28.88	29.78	24.62	A.G.	2	31.18	15.59	21.65*
				W.G.	41	29.57	0.72	

F_{0.05} (2,42) = 3.22
 F_{0.05} (2,41) = 3.225

The table – III shows that the pre-test mean values on Breath holding time of yogic practice, aerobic exercise and control groups are 23.42, 23.64 and 23.37 respectively. The obtained ‘F’ ratio 2.51 for pre test score was less than the table value 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on Breath holding time. The post test mean values on Breath holding time of yogic practice, aerobic exercise and control groups are 28.66, 29.52 and 24.51 respectively. The obtained ‘F’ ratio 8.92 for post test score was greater than the table values 3.21 for df 2 and 42 required for significance at 0.05 level of confidence on Breath holding time. The adjusted post test mean values on Breath holding time of yogic

practice, aerobic exercise and control groups are 28.88, 29.78 and 24.62 respectively. The obtained ‘F’ ratio 21.65 for adjusted post test score was greater than the table value 3.225 for df 2 and 41 required for significance at 0.05 level of confidence on Breath holding time. The results of the study indicated that there was a significant difference among the adjusted post test means of yogic practice, aerobic exercises and control groups on Breath holding time.

Since the obtained ‘F’ ratio value was significant further to find out the paired mean difference, (LSD) post hoc test was employed and presented in table – IV.

Table 4: Paired adjusted final means and difference between means of three different groups of Breath holding time.

Yogic Group (A)	Aerobic group (B)	Control Group (C)	Mean Difference	Critical Difference
28.88	29.78	.....	0.90*	0.62
28.88	.....	24.62	4.26*	0.62
.....	29.78	24.62	5.16*	0.62

The table IV shows that the mean difference values between yogic practice group and aerobic exercises group; yogic practice group and control group & aerobic exercise group and control group are 0.90, 4.26 and 5.16 respectively which are greater than the critical difference value 0.62 at 0.05 level

of confidence. The results of the study showed that there were a significant difference between yogic practice group & aerobic exercise group; yogic practice group & control group and aerobic exercise group & control group on Breath holding time.

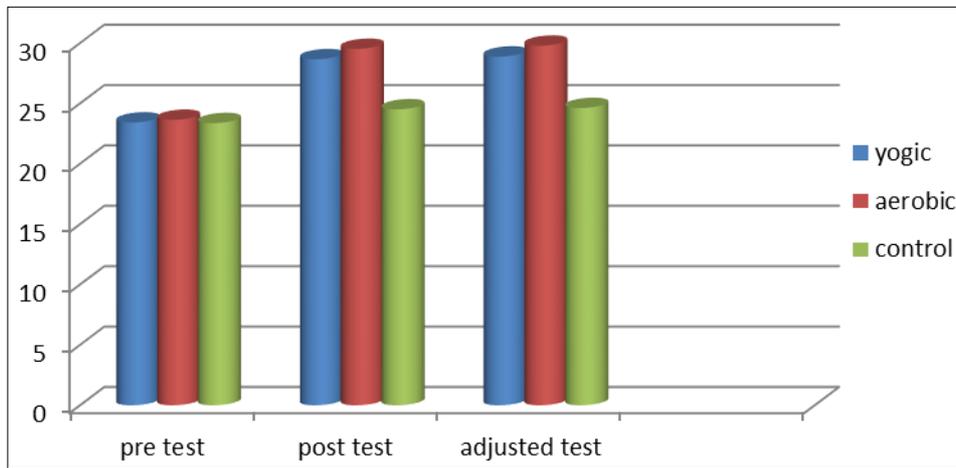


Fig 2: Graphically representation of pre, post and adjusted post test means values of yogic practice group, aerobic practice group and control group on Breath holding time in the Fig II.

Findings and conclusions

From the analysis of the data, the following conclusions were drawn.

1. The result shows that there was no difference in all the three groups before training.
2. Significant differences were found in the two groups after the training.
3. Yogic practice group and aerobic practice group show significant improvement on selected Physical and Physiological variables compared to control groups. These improvements occurred because of planned systematic training.
4. When compared to yogic practice group and aerobic practice group, mean difference showed that significant improvement in yogic practice group on flexibility (1.45) than aerobic exercise group.
5. When compared to yogic practice group and aerobic practice group, mean difference showed that significant improvement in aerobic exercise group on Breath holding time (0.90) than Yogic practice group.

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Practical applications

The findings of the study will help to understand the benefits of yogic training and aerobic training on physical and physiological variables. The results of this study will be of immense support to the sports scientist, physician, teachers and coaches to frame or modify the existing schedules of training.

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