

ISOLATED AND COMBINED EFFECT OF YOGIC PRACTICE AND AEROBIC TRAINING ON MUSCULAR ENDURANCE VARIABLE

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ABSTRACT

The objective of present study was to examine the isolated and combined effect of yogic practice and aerobic training on muscular endurance variable of adolescent boys in Puducherry. Total sixty subjects completed this prospective randomized study with 15 in the yoga group that were matched with the same number of subjects in the aerobic, combined training and control groups. Muscular endurance variable was determined at the beginning (baseline) and after the twelve weeks of training intervention. The subjects were subjected to the twelve weeks of yoga, aerobic and combined yoga & aerobic training program. The difference in the mean muscular endurance value of each group was tested for the significance of difference by ANCOVA test. The muscular endurance variable in the all three experimental groups was markedly improved compared with control group ($P > 0.05$). The results have shown the significant improvement in muscular endurance, since calculated $F (=19.25^*) \geq \text{tab } F .05 (2, 42) (= 4.14)$. But adjusted F ratio value (47.09^*) was significantly higher than the table value. The finding of study suggests that the twelve weeks of isolated and combined yogic practice and aerobic training have significantly improvement on muscular endurance variable. In all cases 0.05 levels has been fixed to test the significance which is considered to be an appropriate.

Key words: Yoga, Aerobic, Muscular endurance, adolescent.

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INTRODUCTION

Participation in daily physical activities is vital for proper growth and maintenance of good health. Exercise is a form of physiological stimulation of the body. In this sense, exercise can be considered as any form of physical activity “involving movement, maintenance of posture or expression of force by muscles. The performance of exercise requires the response of a number of functions within the body. The physical education scientist has been trying to develop new method of training and techniques to attain higher level of performance in game and sports. Physical and physiological variable play a magnificent role in shaping the role of youth personality and physical development along with the improvement of the skills.

Aerobic exercise is exercise that involves or improves oxygen consumption by the body. The word aerobic means "with oxygen". Use of oxygen in the body's metabolic or energy-generating process to perform the work by muscles is referred as aerobics. Many types of exercise performed at moderate levels of intensity for extended periods of time are known as aerobic activity.

The truthful stand for the word yoga is ‘to yoke’. This deals that uniting of self spirit with the universal spirit, or God. The origin of word yoga is from the roots of Sanskrit word ‘Yuj’ which means to unite, to attach, to yoke, and to focus on thoughts within self. According to Patanjali, yoga is way of yoking of all the powers of body, the mind, the emotion which enables one to look at life in all its aspect evenly.

Ability of a muscle or group of muscles to contract against a sub maximal resistance for long duration to overcome the resistance is known as muscular endurance. The muscular endurance tests include the maximum number of pull-ups, push-ups, or sit-ups performed in fixed time unit. The bent-knee sit-up measures muscular endurance of the mid body, providing information on sport performance and possibly on the health of the lower back. Imbalance between the lower back and abdominal musculature may cause back problems as a result of abdominal weakness.

MATERIALS AND METHODS

Selection of the Subjects

The reason to conduct the study was to locate about the isolated and combined effect of yogic practices and aerobic exercise on muscular endurance variable. Sixty adolescence school boys were selected from New Mordern Higher Secondary School, Muthialpet, Puducherry. The chronological age of the selected subjects ranged from fourteen to seventeen years. The subjects were from different family background and homogeneous in their academic activities.

Experimental Design and Variable Testing

The participating subjects (N=60) were randomly distributed in four equal groups with fifteen in each group. Experimental group I was assigned with yoga practice, experimental group II with aerobic exercises, experimental Group III with combination of yoga practice & aerobic exercises. Prior to starting the training baseline tests of the muscular endurance variable was conducted for all the 60 subjects. The post test was measured after the experimental training. The subjects were given 12 weeks respective training for five days per week. Training duration was 45 minutes in the evening session from Monday to Friday. Bend knee sit ups test was used to measure the muscular endurance of the subjects.

The data collected from the four groups on the muscular endurance variable was statistically treated by Analysis of covariance (ANCOVA) to find out significant difference among the four groups. Scheffé's Post Hoc test was used to clarify the difference between adjusted pair wise means when F ratio was significant. The level of significance was fixed at 0.05 level of confidence. All the statistical calculation was carried out using Statistical Package for Social Sciences (SPSS 16.0).

TABLE 1
ANALYSIS OF COVARIANCE FOR PRE TEST AND POST TEST DATA ON
MUSCULAR ENDURANCE

S.No.	Yoga	Aerobic	Combine	Control	Source of variance	Sum of square	df	Mean Square	'F' ratio
Pre-test Mean	16.60	15.67	16.00	15.73	B:	8.13	3	2.71	0.78
S.D.	1.64	2.02	2.10	1.67	W:	195.87	56	3.50	
Post-test Mean	19.87	18.60	20.80	15.80	B:	212.60	3	70.87	19.25*
S.D.	1.77	1.50	2.46	1.82	W:	206.13	56	3.68	
Adjusted Mean	19.37	18.88	20.80	16.02	B:	179.33	3	59.78	47.09*
					W:	69.82	55	1.27	

*Significant at 0.05 level.

F.05 (3, 55/56) = 2.77

It is observed from Table 1 that the pre-test means on muscular endurance of the three experimental groups and control group are 16.60, 15.67, 16.00 and 15.73 respectively. The obtained 'F' ratio value 0.78 for the pre-test mean is lesser than the required table value 2.77 for 3 & 56 degrees of freedom at 0.05 level of confidence. This reveals that there is no significant difference among the four groups on muscular endurance before the commencement of the experimental training. It is inferred that the selection of the subjects for the four groups are successful.

The post test means on muscular endurance of the three experimental groups and control group are 19.87, 18.60, 20.80 and 15.80 respectively. The obtained 'F' ratio value 19.25 for the post test data is greater than the required table value 2.77 for 3 & 56 degrees of freedom at 0.05 levels of confidence. It discloses that there is a significant improvement among the experimental groups on muscular endurance after the experimental training.

The adjusted post test means on muscular endurance of the three experimental groups and control group are 19.37, 18.88, 20.80 and 16.02 respectively. The obtained 'F' ratio value 47.09 for the adjusted post test data is greater than the required table value 2.77 for 3 & 55 degrees of freedom at 0.05 level of confidence. It reveals that there is significant change on muscular endurance as a result of the experimental training and therefore the null hypothesis has been rejected.

TABLE 2
SCHEFFE'S POST HOC TEST ON ADJUSTED MEAN DIFFERENCES
ON MUSCULAR ENDURANCE

Yoga	Aerobic	Combined	Control	Mean differences	Required C.I.
19.37	18.88	-	-	0.49	1.19
19.37	-	20.80	-	1.43*	
19.37	-	-	16.02	3.35*	
-	18.88	20.80	-	1.92*	
-	18.88	-	16.02	2.86*	
-	-	20.80	16.02	4.78*	

*Significant at 0.05 level

Since significant differences are recorded, the Scheffe's Post hoc test is used to find out the paired means significant difference. The obtained results are presented in Table 2.

The above table shows that the Scheffe's post-hoc method of testing the significance for the differences between the paired means on muscular endurance. The paired mean difference between the yoga practice and control group 3.35, aerobic training and control group 2.86, combined group and control group 4.78, combined group and aerobic group 1.92, combined group and yoga group 1.43 are found to be significant at 0.05 level of confidence. Above findings indicate that the combined practice group had a better improvement on muscular endurance when compared to the aerobic group, yoga group and control group. The yoga group is better than the aerobic group and control group.

The differences in means of yogic practice group, aerobic group, combined group and control group are presented through line diagram for better understanding of the results.

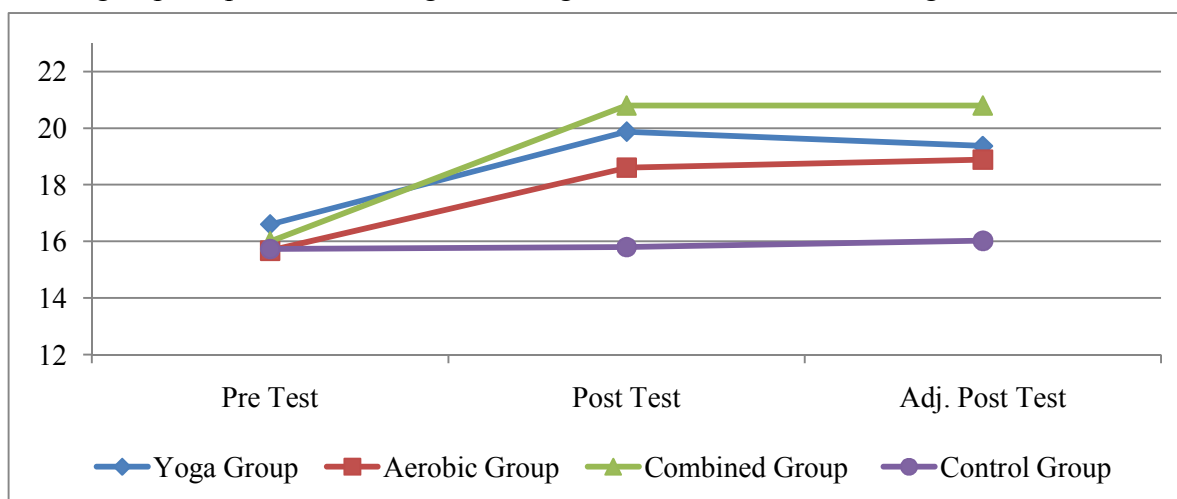


FIGURE- 1- THE PRE TEST, POST TEST AND ADJUSTED POST TEST MEAN VALUES OF EXPERIMENTAL GROUPS AND CONTROL GROUP ON MUSCULAR ENDURANCE

DISCUSSION

The result of the study indicated that muscular endurance variable improves significantly for three experimental groups when compare to control group, after twelve weeks of experimental training. There was no significant difference found in paired means of yoga and aerobic training group whereas significant difference was found in paired means of combined & aerobic training group and combined & yoga training group. It was inferred

from the result of the present study that independent variable has significant improvement on experimental groups due to their respective training programmes.

CONCLUSION

Findings of study concluded that the fitness variable such as muscular endurance may enhanced significantly due to continuous training of yogic practice and aerobic training. Among the experimental training groups, the combined training has better training effect to improve the muscular endurance than aerobic and yoga training groups.

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