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Effects Of Yogic Training Aerobic Training And Detraining On Muscular Endurance Of College Female Students

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Abstract:

The purpose of the study was to find out the effect of yogic training aerobic training and detraining on muscular endurance of college female students. To achieve this purpose of the study, forty five college female students were selected as subjects who were studying various courses in St. Thomas College of Teacher Education, Pala, Deva Matha College, Kuruvilangadu and Alphonsa College, Pala. The selected subjects were aged between 18 to 22 years and they were examined by a qualified physician and certified that they were medically and physically fit to participate above programme. The selected subjects were randomly divided into three groups of 15 subjects each group. Group one acted as control group, experimental group I (yogic) and experimental group II (aerobic). The experimental group subjects were underwent regular practice for eight weeks. The subjects were tested on selected criterion variable such as muscular endurance prior to and immediately after the training period. The selected criterion variable such as muscular endurance was measuring by half squad jump test. In order to test the effect of training, the collected data before, during and after the experimentation on the variable was statistically analysed by using two-way (3×3) factorial analysis of variance with last factor repeated measures. The data collected from the post experimentation and detraining (three cessation) on the variable was statistically analysed by using two way (3×4) factorial ANOVA with last factor repeated measures. Whenever, two way factorial ANOVA is found significant, the Scheffe's post hoc test is applied. The result of the present study has revealed that there was a significant improves the muscular endurance among college students.

Keywords: yogic training, aerobic training, detraining, muscular endurance, college girls.

1. INTRODUCTION

The aim of yoga is to develop the human consciousness from lower level to higher level various yogic practices are brings about positive changes and hormones functioning in the body mind complete. Its practices are effectively used in the treatment of several psychosomatic disorders for which there is a effective treatment in modern medicine. Oxygen is the vital nutrient to our body. It is essential for the integrity of the brain, nervous, glands, and internal organs. we can do without food for weeks and without water for days but without oxygen we die with a few minutes . Thus who breath properly takes in sufficient quantity of Oxygen live healthy and longer. Our ancestors, the rishis and saints have observed that the breathing process is the basics of any living being. On

the basics of their observations of the life span of the living beings they Thus if we reduce our breathing rate, we can prolong our life to longer period. Our rishis in ancient times took four breaths in a minute and lived as long as 200 to 300 years. Pranayama is a Sanskrit word meaning ‘’extention of the prana or breath. The word pranayama is derive from two Sanskrit root called prana and ayama.prana means life force or vital energy particularly breath or Air that leaves from the body. Ayama has two meanings –to enlongate or to with hold or to extend or draw out or control or Not restrain. The primary objective of sports training is to stress various bodily systems to bring about positive adaptation in order to enhance sporting performance. To achieve this objective, coaches and athletes systematically apply a number of training principles including overload, specificity and progression, organized through what is commonly termed periodization. The application of these principles involves the manipulation of various programme design variables including choice of exercise, order of training activities/exercises, training intensity (load and repetition), rest periods between sets and activities/exercises and training frequency and volume in order to provide periods of stimulus and recovery, with the successful balance of these factors resulting in positive adaptation. Aerobic exercise refers to exercise that involves or improve oxygen consumption by the body. Aerobic training increased cardio-respiratory endurance, which in turn increased Vo_2 max, because of it increased level of hemoglobin. Resistance training is an integral part of an adult fitness program and of a sufficient intensity to enhance strength, muscular endurance and maintain fat free mass. Resistance training involves exercise in which the muscles exert a force against an external load. It is most commonly referred to as weight training. Such a training program should be individualized, progressive and specific in terms of the way muscles are likely to be used in the chosen sport. The physiological response to dynamic aerobic exercise is an increase in oxygen consumption and heart rate that parallels the intensity of the imposed activity and a curvilinear increase in stroke volume. The cardiovascular system, composed of the heart, blood vessels and blood responds predictably to the increased demands of exercise. With few exceptions, the cardiovascular response to exercise is directly proportional to the skeletal muscle oxygen demands for any given rate of work and oxygen uptake increases linearly with increasing rates of work. A person’s maximum oxygen uptake is a function of cardiac output multiplied by the arterial-mixed venous oxygen difference. Cardiac output thus plays an important role in meeting the oxygen demands for work. As the rate of work increases, the cardiac output increases in a nearly linear manner to meet the increasing oxygen demand, but only up to the point where it reaches its maximal capacity. It's useful for coaches to know that aerobic capacity is probably trainable in children with a sufficient training stimulus. This makes aerobic training worthwhile, since it will improve their performance. However, the training effect will not be as great as is possible with adults because the lower stroke volume in children prior to full growth will limit the potential cardiac output increases with training. In addition, until after puberty, a poor running economy limits running endurance. Thus, as before, it is probably best to wait until the young athlete reaches adolescence before starting tough aerobic training, as this is the age when the athlete will truly benefit. Tough anaerobic training is of even more limited use for children since they possess little anaerobic capacity. In my opinion, the most important areas of training for children are strength, speed, co-ordination, sport-specific skills, and agility. These are areas where improvements can be made through enhanced neuromuscular recruitment, laying down the skills for adulthood. As the nervous system develops, it seems that the potential for improvement in skills is the greatest. Training for aerobic and anaerobic endurance can be improved from adolescence when the body has reached its natural capacity and responses from this kind of metabolic training are greatest.

2. MATERIALS AND METHODS

In the present study all the students studying various courses in St. Thomas College of Teacher Education, Pala, Deva Matha College, Kuruvilangadu and Alphonsa College, Pala were considered as population for the study. A representative sample of 45 college students in the age of 18-22 years was chosen as sample for the study. For this study muscular endurance was chosen as a variable. The selected subjects were randomly divided into three groups of 15 subjects each group. Group one acted as control group, experimental group I (yogic) and experimental group II (aerobic). The experimental group subjects were underwent regular practice for eight weeks. The subjects were tested on selected criterion variable such as muscular endurance prior to and immediately after the training period. The selected criterion variable such as muscular endurance was measuring by half squad jump test. In order to test the effect of training, the collected data before, during and after the experimentation on the variable was statistically analysed by using two-way (3×3) factorial analysis of variance with last factor repeated measures. The data collected from the post experimentation and detraining (three cessation) on the variable was statistically analysed by using two way (3×4) factorial ANOVA with last factor repeated measures. Whenever, two way factorial ANOVA is found significant, the Scheffe's post hoc test is applied. In all the cases, 0.05 level was used to test this significance.

3. RESULTS

The mean and standard deviation scores of pretest, mid test, posttest, first cessation, second cessation and third cessation of muscular endurance on yogic, aerobic and control groups are given in table I.

Table: I :-Mean Standard Deviation On Muscular Endurance On Pre Test, Mid Test, Post Test, First Cessation, Second Cessation And Third Cessation Period Of Yogic, Aerobic And Control Groups

'Groups		Pre Test	Mid Test	Post Test	First Cessation	Second Cessation	Third Cessation
Yogic Group	Mean	38.24	48.33	54.18	48.56	46.28	43.14
	S.D	7.54	7.42	8.14	7.44	7.65	7.87
Aerobic Group	Mean	38.62	49.75	56.32	49.15	47.62	43.86
	S.D	7.31	7.62	7.84	7.09	8.12	7.82
Control Group	Mean	38.74	38.84	38.82	38.41	37. 61	37.58
	S.D	7.14	7.58	6.92	7.08	7.48	7.12

Table I shows that the pre test mean values on muscular endurance for yogic, aerobic and control group are 38.24, 38.62 and 38.74 respectively. The mid test mean values on muscular endurance for yogic, aerobic and control group are 48.33, 49.75 and 38.84 respectively. The post test mean values on muscular endurance for yogic, aerobic and control group are 54.18, 56.32 and 38.82 respectively. The first cessation mean values on muscular endurance for yogic, aerobic and control group are 48.56, 49.15 and 38.41 respectively. The second cessation mean values on muscular endurance for yogic, aerobic and control group are 46.28, 47.62 and 37. 61 respectively. The third cessation mean values on muscular endurance for yogic, aerobic and control group 43.14, 43.86 and 37.58 respectively. The data on muscular endurance during training period have been analyzed by two way factorial ANOVA (3×3) with repeated measures on last factor and the results are presented in table II.

Table II:-Two Way Analysis Of Variance With Last Factor Repeated Measures On Muscular Endurance Of Control And Experimental Groups At Three Different Testing Periods

Source of Variance	"F" ratio
Rows (Groups)	3.42*
Columns (Testing Periods)	152.72*
Interaction (Groups × Testing Periods)	37. 29*

Table II shows that the "F" ratio for groups is 3.42 (df 2, 42=3.222), the result of the study indicates that significant differences exist among the experimental and control groups irrespective of different stages of testing on muscular endurance, the "F" ratio for different stages of testing period is 152.72 (df 2, 84=3.106), the result of the study indicates that muscular endurance differs significantly among different stages of testing irrespective of groups and the "F" ratio value of interaction is 37.29 (df 4, 84=2.482), the result of the study shows the significant differences exists among groups at each test and also significant differences between tests for each group on muscular endurance. The interaction effect is significant, the simple effect test has been applied as follow up test and presented in table III.

Table III:- The Simple Effect Scores Of Groups (Rows) At Three Different Stages Of Testing (Columns) On Cardio Respiratory Endurance

Source of Variance	"F" ratio
Groups and Pre Test	0.36
Groups and Mid Test	34.28*
Groups and Post Test	64.56*
Tests and Control Group	0.39
Tests and Yogic Group	43.54*
Tests and Aerobic Group	70.68*

Table III shows that the "F" ratio for groups at mid and post test and tests of yogic and aerobic group are 34.28, 64.56, 43.54 and 70.68 (df 2, 84=3.106) respectively. The results of the study indicates that significant difference on muscular endurance exists between groups at mid and post test as well as among the tests of yogic and aerobic group. Whenever the "F" ratio value is found to be significant, the Scheffe's post hoc test is applied to find out the paired mean differences, and it is presented in tables IV and V.

Table IV:- Scheffe's Test For Different Groups At Each Testing Periods During Training On Muscular Endurance

Testing Periods	Yogic Group	Aerobic Group	Control Group	Mean Difference
Pre test	38.24		38.74	0.50
		38.62	38.74	0.12
	38.24	38.62		0.38
Mid test	48.33		38.84	9.49*
		49.75	38.84	10.91*
	48.33	49.75		1.42*
Post test	54.18		38.82	15.36*
		56.32	38.82	17.50*
	54.18	56.32		2.14*

Table IV shows that the mean difference values of muscular endurance during the mid test between yogic and control group, aerobic and control group and yogic and aerobic group are 9.49, 10.91 and 1.42 respectively, the post test between yogic and control group, aerobic and control group and yogic and aerobic group are 15.36, 17.50 and 2.14 respectively. The result reveals that the aerobic group is superior to yogic group and yogic group is better than the control group.

Table V:- Scheffe's Test For Groups At Different Testing Periods During Training On Muscular Endurance

	Pre test	Mid test	Post test	Mean Difference
Yogic Group	38.24	48.33		10.09*
	38.24		54.18	15.94*

		48.33	54.18	5.85*
Aerobic Group	38.62	49.75		11.13*
	38.62		56.32	17.70*
		49.75	56.32	6.57*
Control Group	38.74	38.84		0.10
	38.74		38.82	0.08
		38.84	38.82	0.02

Table V shows that the mean difference values of muscular endurance of the yogic group during the pre test to mid test, pre test to post test and mid test to post test are 10.09, 15.94 and 5.85 respectively, the aerobic group during the pre test to mid test, pre test to post test and mid test to post test are 11.13, 17.70 and 6.57 respectively. The result reveals that the muscular endurance is found to be more effective during the pre test to mid test when compared to the mid test to post test period. The data on muscular endurance during detraining period have been analyzed by two way factorial ANOVA (3×4) are presented in table VI.

Table VI:- Two Way Analysis Of Variance With Last Factor Repeated Measures On Muscular Endurance Of Control And Experimental Groups At Four Different Testing Factors

Source of Variance	"F" ratio
Rows (Groups)	3.98*
Columns (Testing Periods)	70.54*
Interaction (Groups × Testing Periods)	24.33*

Table VI shows that the "F" ratio for groups is 3.98 (df 2, 42=3.222), the result of the study indicates that significant differences exist among the experimental and control groups irrespective of different stages of testing on muscular endurance, the "F" ratio for different stages of testing period is 70.54 (df 3, 126=2.68), the result of the study indicates that muscular endurance differs significantly among different stages of testing irrespective of groups and the "F" ratio value of interaction is 24.33 (df 6, 126=2.17), the result of the study shows the significant differences exists among groups at each test and also significant differences between tests for each group on muscular endurance. The interaction effect is significant; the simple effect test has been applied as follow up test and presented in table VII.

Table VII:- The Simple Effect Scores Of Groups (Rows) At Four Different Stages Of Testing (Columns) On Muscular Endurance

Source of Variance	"F" ratio
Groups and Post Test	74.42*
Groups and First Cessation	28.12*
Groups and Second Cessation	10.86*
Groups and Third Cessation	5.42*
Tests and Control Group	2.36
Tests and Yogic Group	13.84*
Tests and Aerobic Group	27.32*

Table VII shows that the "F" ratio for groups at post test, first, second and third cessation are 74.42, 28.12, 10.86 and 5.42 (df 2, 126=3.069) respectively, the "F" ratio for tests of yogic and aerobic group are 13.84 and 27.32 respectively. The results of the study indicate that significant difference on muscular endurance exists between groups at post test, first, second and third cessation as well as among the tests of yogic and aerobic group. Whenever the "F" ratio value is found to be significant, the Scheffe's post hoc test is applied to find out the paired mean differences, and it is presented in tables VIII.

Table VIII:- Scheffe's Test For Different Groups At Each Testing Periods During Training Cessation On Muscular Endurance

Testing Periods	Yogic Group	Aerobic Group	Control Group	Mean Difference
Post Test	54.18		38.82	15.36*
		56.32	38.82	17.50*
	54.18	56.32		2.14*
First Cessation	48.56		38.41	10.15*
		49.15	38.41	10.74*
	48.56	49.15		0.59*
Second Cessation	46.28		37. 61	8.67*
		47.62	37. 61	10.01*
	46.28	47.62		1.34*
Third Cessation	43.14		37.58	5.56*
		43.86	37.58	6.28*
	43.14	43.86		0.72*

Table VIII shows that the mean difference on muscular endurance is found to be significant for the three groups during the post test, first, second and third cessation.

Table IX:- Scheffe's Test For Each Group At Different Testing Periods During Training Cessation On Muscular Endurance

	Post Test	First Cessation	Second Cessation	Third Cessation	Mean Difference
Yogic Group	54.18	48.56			5.62*
	54.18		46.28		7.90*
	54.18			43.14	11.04*
		48.56	46.28		2.28*
		48.56		43.14	5.42*
			46.28	43.14	3.14*
Aerobic Group	56.32	49.15			7.17*
	56.32		47.62		8.70*
	56.32			43.86	12.46*
		49.15	47.62		1.53*
		49.15		43.86	5.29*
			47.62	43.86	3.76*
Control Group	38.82	38.41			0.41
	38.82		37. 61		1.21
	38.82			37.58	1.24
		38.41	37. 61		0.80
		38.41		37.58	0.83
			37. 61	37.58	0.03

Table IX shows that the mean difference of the yogic group during the post test to first, second and third cessations are 5.62, 7.90 and 11.04 respectively, the mean difference between first to second and third cessation are 2.28 and 5.42 respectively and second to third cessation is 3.14
The aerobic group during the post test to first, second and third cessations are 7.17, 8.70 and 12.46 respectively, the mean difference between first to second and third cessation are 1.53 and 5.29 respectively and second to third cessation is 3.76. The results reveal that the mean difference of aerobic is higher than the yogic group.

4. DISCUSSION

The results of the study showed that both the experimental groups have significantly increased in the muscular endurance when compared to the control group. Finally aerobic training group is seen that the muscular endurance has significantly improved when compared to the yogic group. The

results by and large are in conformity with findings of Licl and others, Toy and Shenbagavalli and Mary Recthammal, Baljit Singh Sekhon and P. V. Shelvam, K. A. Joel Santhosh Kumar and P. V. Shelvam.

5. CONCLUSION

Yogic training and aerobic training reveals significant improvement during mid and post test period on muscular endurance when compared to the control group. Aerobic training is better than the yogic training on muscular endurance. Yogic training and aerobic training groups shows that there is gradual reduction on muscular endurance during training cessation periods.

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