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Effects of Yoga Training Aerobic Training and Detraining on Muscular Endurance among College Boys

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Abstract

The purpose of the study was to find out the effects of yoga training aerobic training and detraining on muscular endurance among college boys. To achieve this purpose of the study, forty-five college boys were selected as subjects who were studied various departments in the **CCS University, Meerut**. The selected subjects were aged between 18 to 21 years. The selected subjects were randomly divided into three groups of 15 subjects each group. Group one acted as experimental group I (yoga training) and group two acted as experimental group II (aerobic training) and group three acted as control group. 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 measured by Bent knee sit ups. The collected data from the three groups before, during and after the experimentation was statistically analyzed by using two-way (3×3) factorial analysis of variance with last factor repeated measures. The data collected from the three groups at post test and detraining (three cessation) was statistically analyzed by using two ways (3×4) factorial ANOVA with last factor repeated measures. Two-way factorial ANOVA was used to find out the significant differences if any, the Schaffer's test is applied as post hoc test to determine which of the paired mean had significant differences. The 0.05 level of confidence was fixed to test the significance. The result of the present study has revealed that there was a significant difference among the experimental and control group on muscular endurance.

***Index Terms*-:** Yoga Training-Aerobic Training-Physical Fitness Variables

INDRODUCTION

Physical Education aims to keep people "healthy". The Physical Education / health programmed provide boys and girls with accurate and significant knowledge related to their individual needs and interest. There is also concern for health services and healthy physical and emotional environment. Physical fitness is more than is not being sick or merely being well. It is different from resistance or immunity from disease. Physical fitness therefore is an essential quality in humans. Yoga is a systematic and methodological process to control and develop the mind and body to attain good health, balance of mind and self-realization. Thought yoga has the potential power to make us healthy added to our vigor, still most of the people lack the knowledge of systematic practice of yoga? They perform yogic

exercises for a short period and when their health improves, they discontinue the practices. For this reason, the effective results of yogic practices cannot be determined perfectly. Many scientists, doctors, psychologists etc, all over the world are extensively studying the beneficial aspects of yoga which encourages us to attain positive health through yoga. Aerobic exercise comprises innumerable forms. In general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not. Playing singles tennis, with near-continuous motion, is generally considered aerobic activity, while golf or two person team tennis, with brief bursts of activity punctuated by more frequent breaks, may not be predominantly aerobic.

METHODOLOGY

The purpose of the study was to find out the effects of yoga training aerobic training and detraining on muscular endurance among college boys. To achieve this purpose of the study, forty five college boys were selected as subjects who were studied various departments in the CCS University, Meerut. The selected subjects were aged between 18 to 21 years. The selected subjects were randomly divided into three groups of 15 subjects each group. Group one acted as experimental group I (yoga training) and group two acted as experimental group II (aerobic training) and group three acted as control group. 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 measured by bent knee sit ups. The collected data from the three groups before, during and after the experimentation was statistically analyzed by using two-way (3×3) factorial analysis of variance with last factor repeated measures. The data collected from the three groups at post test and detraining (three cessation) was statistically analyzed by using two way (3×4) factorial ANOVA with last factor repeated measures. Two way factorial ANOVA was used to find out the significant differences if any, the Schaffer's test is applied as post hoc test to determine which of the paired mean had significant differences. The0.05 level of confidence was fixed to test the significance.

RESULTS

Findings: The mean and standard deviation values on muscular endurance of pretest, mid test, posttest, first cessation, second cessation and third cessation period scores of yogic, aerobic and control group are given in table **I**

Table I: MEAN AND S.D. VALUES ON MUSCULAR ENDURANCE OF PRETEST, MID TEST, POSTTEST, FIRST CESSATION, SECOND CESSATION AND THIRD CESSATION PERIOD SCORES OF YOGIC, AEROBIC AND CONTROL GROUPS

Group		Pretest	Mid test	Post test	I cessation	II cessation	III cessation
Yogic	**Mean**	17.47	21.27	23.67	21.53	20.27	18.87
	S.D	7.75	7.75	7.79	7.50	7.39	7.44
Aerobic	**Mean**	17.60	23.93	27.60	23.27	21.47	19.53
	S.D	3.91	3.45	3.46	2.89	2.85	2.59
Control	**Mean**	17.67	17.73	17.80	17.80	17.73	17.73
	S.D	5.05	4.96	4.84	4.84	4.71	4.68

Table I shows the analyzed data of muscular endurance. The pre means for yogic, aerobic and control group are 17.47, 17.60 and 17.67 respectively. The mid test means for yogic, aerobic and control group are 21.27, 23.93 and 17.73 respectively. The post means for yogic, aerobic and control group are 23.67, 27.60 and 17.80 respectively. The I cessation means for yogic, aerobic and control group are 21.53, 23.27 and 17.80 respectively. The II cessation means for yogic, aerobic and control group are 20.27, 21.47 and 17.73 respectively and the III cessation means for yogic, aerobic and control group are 18.87, 19.53 and 17.73respectively.

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 TableII.

Table II: TWO WAY ANALYSIS OF VARIANCE WITH LAST FACTOR REPEATED MEASURES ON MUSCULAR ENDURANCE OF CONTROL AND EXPERIMENTAL GROUPS AT THREEDIFFERENT TESTINGPERIODS

Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Rows (Groups)	639.748	2	319.874	3.29*
Error	4079.911	42	97.141	
Columns (Testing Periods)	680.726	2	340.363	989.67*
Interaction (Rows × Columns)	380.385	4	95.096	279.51*
Error	28.889	84	0.344	

Table II it is clear that the obtained 'F' ratio for groups, different stages of testing period and interaction are 4.796, 214.46 and45.85respectively,whichwasgreaterthanthetablevalue(2and42=3.22,2and84=3.106and4and84=2.482respectively).

The result of the study indicates that, significant differences exist among the experimental and control groups irrespective of different stages of testing muscular endurance.

The results of the study indicate that significant differences exist in the interaction effect (between groups and tests) on muscular endurance. Since the interaction effect is significant, the simple effect test has been applied as follow up test and it is presented in Table III

Table III: THE SIMPLE EFFECT SCORES OF GROUPS AT THREE DIFFERENT TESTING PERIODS ON MUSCULAR ENDURANCE

Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Groups and Pre test	0.156	2	0.078	0.227
Groups and Mid test	145.089	2	72.545	210.89*
Groups and Post test	364.822	2	182.411	530.27*
Tests and Control Group	0.067	2	0.034	0.097
Tests and Yoga Group	146.60	2	73.30	213.08*
Tests and Aerobic Group	151.667	2	75.834	220.45*
Error	28.889	84	0.344	

Table III Shows that the obtained 'F' ratio for groups at mid and post test are 210.89 and 530.27 respectively. The result of the study indicates that significant difference on muscular endurance exists between groups at mid and post test. Further it denotes that the obtained 'F' ratio values for tests of yogic and aerobic group are 213.08 and 220.45 respectively. The result of the study indicates that significant difference on muscular endurance among the tests of yogic and aerobicgroup.

Whenever, the obtained 'F' ratio value is found to be significant, the Schaffer's post hoc test is applied to find out the paired mean differences and it is presented in Tables IV and V.

Table IV: SCHEFFĚ *S* TEST FOR THE DIFFERENCE BETWEEN THE DIFFERENT GROUPS ON MUSCULAR ENDURANCE

Testing Periods	Yogic Group	Aerobic Group	Control Group	Mean Difference
Pre test	17.47		17.67	0.20
		17.60	17.67	0.07
	17.47	17.60		0.13
Mid test	21.27		17.73	3.54*
		23.93	17.73	6.20*
	21.27	23.93		2.66*
Post test	23.67		17.80	5.87*
		27.60	17.80	9.80*
	23.67	27.60		3.93*

From the above table it has been observed that the mean difference values on muscular endurance during the mid test between the yogic and control group are 3.54, aerobic and control group are 6.20 and yogic and aerobic group are 2.66. The post test between the yogic and control group are 5.87, aerobic and control group are 9.80 and yogic and aerobic group are 3.93. There is significant difference among the three groups which denotes that both the experimental groups are significantly better on muscular endurance than the controlgroup.

Table V:SCHEFFĚ *S* TEST FOR THE DIFFERENCE BETWEEN THE EACH GROUP AT DIFFERENT TESTING PERIODS ON MUSCULAR ENDURANCE

Group	Pre test	Mid test	Post test	Mean Difference
Yogic	17.47	21.27		3.80*
	17.47		23.67	6.20*
		21.27	23.67	2.40*
Aerobic	17.60	23.93		6.33*
	17.60		27.60	10.00*
		23.93	27.60	3.67*
Control	17.67	17.73		0.06
	17.67		17.80	0.13

From the above table it has been observed that the mean difference values on muscular endurance of yogic group during the pre test to mid test are 3.80, pre test to post test are 6.20 and mid test to post test are 2.40. The mean differences of aerobic group pre test to mid test are 6.33, pre test to post test are 10.00 and mid test to post test are 3.67. There is significant difference during the pre test to mid test, pre test to post test and mid test to post test period.

Table VI: TWO WAY ANALYSIS OF VARIANCE WITH LAST FACTOR REPEATED MEASURES ON MUSCULAR ENDURANCE OF CONTROL AND EXPERIMENTAL GROUPS AT FOUR DIFFERENT TESTING PERIODS

Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Rows (Groups)	831.744	2	415.872	3.58*
Error	4878.50	42	116.155	
Columns (Testing Periods)	457.994	3	151.665	289.98*
Interaction (Rows × Columns)	265.856	6	44.309	84.72*
Error	65.90	126	0.532	

Table VI it is clear that the obtained 'F' ratio for groups, different stages of testing period and interaction are 3.58, 289.98 and 84.72 respectively, which was greater than the table value (2 and 42 =3.22, 3 and 126 = 2.68 and 6 and 126 = 2.17 respectively). The result of the study indicates that, significant differences exist among groups at each test and also significant differences between tests for each group on muscularendurance.

Table VII: THE SIMPLE EFFECT SCORES OF GROUPS AT THREE DIFFERENT TESTING PERIODS ON MUSCULAR ENDURANCE

Source of Variance	Sum of Squares	df	Mean Squares	'F' ratio
Groups and Post test	364.822	2	182.411	342.88*
Groups and I Cessation	117.067	2	58.534	110.03*
Groups and II Cessation	54.489	2	27.245	51.21*
Groups and III Cessation	12.422	2	6.211	11.68*
Tests and Control Group	0.22	3	0.073	0.138
Tests and Yoga Group	62.283	3	20.761	39.02*
Tests and Aerobic Group	177.978	3	59.326	111.52*
Error	65.90	126	0.532	

Table VII Shows that the obtained 'F' ratio for groups at post, I cessation, II cessation and III cessation are 342.88, 110.03, 51.21And 11.68 respectively. The result of the study indicates that significant difference on muscular endurance exists between groups at post test, I cessation, II cessation and III cessation. Further it denotes that the obtained 'F' ratio values for tests of yogic and aerobic group are 39.02 and 111.52 respectively. The result of the study indicates that significant difference on muscular endurance among the tests of yogic and aerobicgroup

Whenever, the obtained 'F' ratio value is found to be significant, the Schaffer's post hoc test is applied to find out the paired mean differences and it is presented in Tables VIII and IX.

Table VIII: SCHEFFĒ *S* TEST FOR THE DIFFERENCE BETWEEN THE DIFFERENT GROUPS AT EACH TRAINING CESSATION ON MUSCULAR ENDURANCE

Testing Periods	Yogic Group	Aerobic Group	Control Group	Mean Difference
Post test	23.67		17.80	5.87*
		27.60	17.80	9.80*
	23.67	27.60		3.93*
I Cessation	21.53		17.80	3.73*
		23.27	17.80	5.47*
	21.53	23.27		1.74*
II Cessation	20.27		17.73	2.54*
		21.47	17.73	3.74*
	20.27	21.47		1.20*
	19.07		17.73	1.34*
		19.53	17.73	1.80*
	19.07	19.53		0.46

From the above table it has been observed that the mean difference values on muscular endurance is found to be significant for the three groups during the post test, I cessation, II cessation and III cessation.

Table IX: SCHEFFĚ *S* TEST FOR THE DIFFERENCE BETWEEN THE EACH GROUP AT DIFFERENT TESTING PERIODS AT TRAINING CESSATION ON MUSCULAR ENDURANCE

Group	Post test	I Cessation	II Cessation	III Cessation	Mean Difference
Yogic	23.67	21.53			2.14*
	23.67		20.27		3.40*
	23.67			18.87	4.80*
		21.53	20.27		1.26*
		21.53		18.87	2.66*
			20.27	18.87	1.40*
Aerobic	27.60	23.27			4.33*
	27.60		21.47		6.13*
	27.60			19.53	8.07*
		23.27	21.47		1.80*
		23.27		19.53	3.74*
			21.47	19.53	1.94*
Control	17.80	17.80			0.00
	17.80		17.73		0.07
	17.80			17.73	0.07
		17.80	17.73		0.07
		17.80		17.73	0.07
			17.73	17.73	0.00

From the above table it has been observed that the mean difference values on muscular endurance of yogic group and aerobic group have significant difference during the all training cessation

DISCUSSION/CONCLUSIONS

The results of the present study indicate that both the experimental groups have significantly increased the muscular endurance when compared to the control group. The result of the study is in consonance with **Madanmohan et al**, (2008), **Chen et al**, (2009) and **Licl et al**, (2006). Further, the improvement of muscular endurance is significantly higher for the aerobic group when compared to yogic group during training periods. But during the training cessation periods both the experimental groups has significantly reduced gradual manner for first, second and third cessationperiod

REFERRENCE

1. **Chen T.L, et al., (2009) "The Effect of Yoga Exercise Intervention on Health Related Physical Fitness in School-Age Asthmatic Children", The Journal of Nursing, VolII.**
2. **Clarke David H. and H. Harrison Clarke, (1988) *Advanced Statistics*, (New Jersey: Prentice Hall Inc.,),31-38.**
3. **Cooper, H. Kenneth, (2009) Aerobics, Bantan Publishing,www.en.vikipedia.org.**
4. **Davis. R.J., et. al., (1991) Physical Education and The Study of Sport, England:Wolf PublishingLtd.,**
5. **Exercise: 7 Benefits of Regular Exercise,www.mayoclinic.com/health/exercise/HQ01676**
6. **Hertler L, et. al., (1992) "Water Running and the Maintanence of Maximum Oxygen Consumption and Leg Strength in Women", Medicine and Science in Sports and Exercise, 24,S23.**
7. **Licl et al., (2006) "The Effectiveness of an Aerobic Exercise Intervention on Worksite Health – Related Physical Fitness – a case in a High-Tech Company", Chang Gung Medical Journal, VolI.**
8. **Madanmohan et al., (2008) "Effect of Six Week Yoga Training on Weight Loss Following Step Test, Respiratory Pressure, Handgrip Strength and Hand Grip Endurance in Young Healthy Subjects", Indian Journal of Physiology and Pharmacology,Vol.II.**

9. **Pradhan, P.K., (2008) "Yogic Practices for Health and Sports Performance", Indian Journal of Yoga Exercises & Sports Sciences and Physical Education, Vol. II.,12.**

10. **Stevan Roy and Richard Irvin, *Sports Medicine Prevention, Evaluation, Management and Rehabilitation* (*Englewood cliffs:Prentice Hall Inc. 1993*)64.**