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Effect of Resistance Training Endurance Training and Combined Training on Selected Physical Fitness Variables among College going Male student age group 18-21

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Abstract

Purpose of the study was find out the effect of resistance training, endurance training, and combined training selected physical fitness variables among college men. For this purpose eighty male student age group 18 -21 year were selected for the study. They were dived into four equal group each group consisting twenty male students. In which the resistance training group A (N=20), endurance training group B (N=20), Combined training (resistance and endurance) group C (N=20) and control group D (N=20). For testing the leg strength and back strength the dynamometer was used and to test the cardio-respiratory endurance, the Cooper's 12 minutes run/walk test was administered. The analysis between the three various training groups and one control group on selected criterion variables separately, find out the significant difference was used covariance (ANCOVA), Since there was four different groups involved in the present study, the Scheffé S test was used as a posthoc test. The selected criterion variables such as the leg and back strength were improved significantly for combined training group and resistance training group, and in cardio-respiratory endurance, the endurance training group and combined training groups were significantly improved. Leg strength, back strength, and cardio-respiratory were improved significantly for all the training groups when compared with the control group.

Keywords: Resistance training, endurance training, physical fitness, leg strength, back strength and cardio-respiratory endurance.

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Introduction

Human beings have consistently improved their performance to run as faster, jump higher and exhibit greater strength, endurance, and skill. Human beings are naturally ambitious and progressive of superiority in their athletic performances. As a result of practical experience, observation and scientific experimentation, the old method of conditioning, though fascinating and rich in tradition, have been discarded and replaced by new methods based on insight and understanding. For centuries, this evaluation towards better methods of conditioning was slow, but in the recent years the dramatic changes that have taken place have brought about some as outstanding results in performance. New advances scientific training method make it possible to run faster and jump higher than ever before. Physical education is most commonly used the term to give Physical Exercises or Sports or Games in which the students to have participated in the interested area. Physical training is one of the most important elements in training to achieve athlete high performance. Physical exercise and training main objectives are to develop bio-motor abilities and strengthen the athlete's physiological

potential to the highest level (Tudor O. Bompa, 1999).

Sports training are a process of athletic performance improvement, which is conducted on the basis of scientific training principles and which, through systematic development of physiological and physical efficiency, capacity and motivation, enables the athletes to produce outstanding performance and record-breaking athletic performances (Dietrich Harre, 1982). Resistance training has two different meanings. In a simple word, the resistance training is known the training that uses a resistance to the force of muscular contraction and elastic or hydraulic resistance, (www.wikipedia.org). according to the American Sports Medicine Institute Resistance training also known as a weight training or strength training - is a "specialized method of training designed to improve muscle strength, endurance, and power," (ASMI) (Edward G. Mcfarland,). Endurance is a term widely used in sport and can mean many individual things and individual people. In various sports, it refers to an athlete's ability to sustain prolonged exercise for minutes, hours, or even days as sports requirement. Endurance needs to provide energy to the working muscles by circulatory and respiratory systems in order to support sustained various physical activity (www.busywomenfitness.com). Leg strength plays a key role in the daily activities of a human. It is an important factor for including in almost all games and sports. There is an old saying that an athlete will go only as long as his legs will carry him. Cardio-respiratory endurance is the

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ability to work close to one's maximum aerobic capacity for a prolonged period of time. To increase one's endurance is to depend upon increasing the ability to work at high, relative workload for extended periods of time.

Methodology

Selection of Subjects

The purpose of the study was to find out the effect of resistance training, endurance training, and combined training selected physical fitness variables among college going, male student. To achieve this purpose, eighty male students studying in DadapatilRajale Arts and Science College, Adinath nagar were randomly selected as subjects the age of the subjects were ranged from 18 to 21 year were selected for the study. The subjects were further classified at random into four equal group each group consisting twenty male students. In which the group A (N=20) underwent resistance training, group B (N=20) underwent endurance training, group C (N=20) underwent Combined training and control group D (N=20).

Selection of Variables

The subjects were assessed on selected criterion variables namely

- A) Leg strength
- B) back strength
- C) cardio-respiratory

Criterion Measures

Before and after the training period. The selected variables were measured by using standard testing procedures.

1. leg strength and back strength was measured by the dynamometer

2. Cardiorespiratory Endurance was measured by Coopers 12 Minutes run and walk test recorded in a meter.

Collection of data

Before the administration of resistance training, endurance training, and combined training, the selected tests for selected physical variables were administered to both the experimental and control groups to collect pretest data. After the completion of twelve weeks training again the same tests were conducted to collect the post-training data. Necessary instructions were given to the subjects before administration of the tests.

Administration of training

The training for the experimental group was administered at Dada PatilRajale Arts and Science College, Adinath nagar, resistance training, endurance training, and combined training were given to experimental group on 3 alternate day sessions per week for twelve weeks. Each training session consisted of 60-90 minutes included 10-15 minutes of warming up and 10-15 minutes for cooling down. Remaining minutes allotted for resistance training, endurance training, and combined training programmer.

Statistical Procedure

The data were analyzed by applying descriptive statistical and Analysis of Co-Variance (ANCOVA). Whenever the 'F' ratio for adjusted posttest mean was found to be significant, the Scheffé'S test was applied as a posthoc test. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance. The data analyzed with the help of SPSS (16.0 version) software.

Result and Findings of the Study

Table 1

Analysis of Covariance and 'F' ratio for Leg Strength, Back Strength and Cardio-respiratory Endurance of Resistance Training Group, Endurance Training Group and Combined Training Group and Control Group

Variable name	Group Name	Resistance Training Group	Endurance Training Group	Combined Training Group	Control Group	'F' ratio
Leg strength	Pre-test Mean \pm S.D	74.60 \pm 2.334	75.20 \pm 3.256	73.13 \pm 3.114	74.33 \pm 3.196	1.289
	Post-test Mean \pm S.D.	78.60 \pm 2.694	76.67 \pm 3.155	74.80 \pm 2.651	74.53 \pm 3.335	6.055*
	Adj. Post-test Mean	78.333	75.833	75.917	74.518	38.36*
Back strength	Pre-test Mean \pm S.D	65.13 \pm 1.552	64.47 \pm 1.807	64.13 \pm 2.560	64.87 \pm 2.356	0.654
	Post-test Mean \pm S.D.	71.93 \pm 2.434	66.13 \pm 2.10	66.00 \pm 2.591	64.87 \pm 2.031	28.74*
	Adj. Post-	71.506	66.295	66.456	64.675	70.125*

	test Mean					
Cardio-respiratory	Pre-test Mean ± S.D	1596.67 ±45.93	1598.67 ±68.02	1626.00 ±40.32	1626.00 ±73.659	1.167
	Post-test Mean ± S.D.	1618.67 ±41.720	1618.67 ±59.217	1618.67 ±35.817	1618.67 ±71.00	1.40*
	Adj. Post-test Mean	1630.76	1753.17	1684.70	1613.37	82.605*

*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 3 and 56 and 3 and 55 were 2.77 and 2.78 respectively).

Table 2

Scheffé's Test for the Difference between the Adjusted Post-Test Mean of Leg Strength Back Strength and Cardio-respiratory Endurance

Resistance Training Group	Endurance Training Group	Combined Training Group	Control Group	Mean Difference	Confidence Interval at 0.05 level
Adjusted Post-test Mean for Leg Strength					
78.333	75.833			2.5*	1.0438
78.333		75.917		2.416*	1.0438
78.333			74.518	3.815*	1.0438
	75.833	75.917		0.084	1.0438
	75.833		74.518	1.315*	1.0438
		75.917	74.518	1.399*	1.0438
Adjusted Post-test Mean for Back Strength					
71.506	66.295			5.211*	1.4364
71.506		66.456		5.05*	1.4364
71.506			64.675	6.831*	1.4364
	66.295	66.456		0.161	1.4364
	66.295		64.675	1.62*	1.4364
		66.456	64.675	1.781*	1.4364
Adjusted Post-test Mean for Cardio-respiratory Endurance					
1630.76	1753.17			122.41*	28.1677
1630.76		1684.703		53.943*	28.1677
1630.76			1613.37	17.39	28.1677
	1753.17	1684.703		68.467*	28.1677
	1753.17		1613.37	139.8*	28.1677
		1684.703	1613.37	71.33*	28.1677

*significant at 0.05 level of confidence.

Table 1 show that there was a significant difference among resistance training group, endurance training group, combined resistance and endurance and resistance training group and control group on leg strength, back strength, and cardio-respiratory endurance. Table 2 shows that the Scheffé's Test for the difference between adjusted post-test mean of resistance training group and endurance training groups (2.5), resistance training group and combined training group (2.416), resistance training group and control group (3.815), endurance training group and control group (1.315) and combined training group and control group (1.399), which were significant at .05 level of confidence. But there was no significant difference between endurance training group and combined training group (0.084) on leg strength after the training programmer. Table 2 also shows that the Scheffé's Test for the difference between adjusted post-test mean difference in back strength between resistance training group and endurance group (5.211), resistance training group and combined training group (6.831), resistance training group and control group (1.62) combined training group and control group (1.781) were significant at .05 level of confidence. But there was no significant difference between endurance training group and combined training groups (0.161) on back strength after the training programmer.

Table 2 shows that the Scheffé's Test for the difference between adjusted post-test mean difference in cardio-respiratory endurance between resistance training group and endurance group (122.41), resistance training group and combined training group (53.943), endurance training group and combined training group (68.467), endurance training group and control group (139.8) combined training group and control group (71.33) were significant at .05 level of confidence. But there was no significant difference between resistance training group and control group (17.39) on cardio-respiratory endurance after the training programmer.

Conclusions

1. It was concluded from the results of the study that the leg and back strength has improved significantly after the respective training programmer. But in the cardio-respiratory endurance, resistance training group has not improved significantly.
2. When compared with the control group, all the

training group has significantly differed in both the criterion variables, except in cardio-respiratory endurance, the resistance training has not differed from the control group significantly.

3. It was also concluded that the resistance training group has improved their leg and back strength better than the endurance training group and combined training group significantly. But the endurance training group and combined training group have also improved their performance significantly.
4. There was no significant improvement in cardio-respiratory endurance for the resistance training group when compared with the control group. But all the remaining training groups have improved on cardio-respiratory endurance significantly.

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