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Effect of Progressive Resistance Training Programme on Selected Physical Fitness Components among College Men

J. Arul Prasad[1] , Dr. D. Gokulakrishnan[2]

[1]*Ph.D., Scholar, Research and Development Centre, Bharathiar University, Coimbatore, Tamilnadu, India.*
[2]*Director of Physical Education, Salem Sowdeswari College, Salem, Tamilnadu, India.*

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Abstract

The purpose of the study was to investigate the effect of progressive resistance training programme on selected physical fitness components among college men. To achieve the purpose thirty students were selected at random from Selvam Educational Institutions, Namakkal. Age ranged between 18 - 25 years for this study. The subjects were divided into two equal groups namely experimental group 'A' and Control group 'B'. The experimental group 'A' under went eight weeks training program. No attempt was made to equate the groups in any manner. Training process has been carried out as per the scheduled Performa. The control group was not allowed any type of training other than the daily day to day activities. The data collected from the two groups prior to and after experimentation on selected variables; physical fitness components of strength, endurance, explosive power, speed and flexibility were statistically examined for significant differences. Analysis of co variance (ANCOVA) was applied to determine whether the training programmes produced significantly different improvements in selected variables after 8 weeks of training. The group mean gains recorded by the various groups during the experimental period of eight weeks to the criterion measures were tested for the significance by applying 't' test. In all the cases 0.05 level of confidence will be utilized which was considered as an appropriate. Based on the result of the study it was concluded that, the progressive resistance training programme produced a significant development on the selected physical fitness components.

Keywords: Resistance Training, Strength, Endurance, Speed.

Introduction

Sports training aim at achieving higher performance in sports competition. In order to achieve higher performance in sports, training should be based on systematic facts and principles and it is done in a planned and systematic manner. A system most suitable for achieving higher performance has to be first made on the basis of which sports training is planned. It is always assessed, planned, organized and improved by a coach or a sports teacher or the athlete himself. The sport training aims at finding hidden reserves and makes the sports person aware of it. It also aims at grater development of the reserves. The sports person controls their day to day routine in such a manner that they are able to do training once or twice a day with high effect. It is a continuous process of perfection, improvement and criterion of means and methods of improving sports performance and factors of performance.

Physical fitness is a prime asset and an athlete must possess strength, endurance, speed and agility. It is the duty of the coaches to select suitable training method based on scientific principles to acquire these traits towards better performance. Among the training methods, the most popular result oriented method is "resistance training". It not only develops the strength and the power which the athlete needs, but also perfects the execution of the skill.

Morehouse and miller (1972) quote that with the adding of resistance to movement there is sensory stimuli, particularly from muscle spindles. Feedback from these kinesthetic proprioceptors produces corrective changes in movement and posture. Thus the co-ordination of the motor act is facilitated. German scholar Muellar (2005) stated the word sports in the 1950's when he stated that one isometric contraction using two third of the resistance, once daily, was the best for an increase in strength.

The object of tracking is that the body may be enabled to withstand the strains of life and perform the required work of it without much injury to the system of body. The harmonious development of the whole body will correct the faults and put the body in a better state to perform any other that may be required of it. Now it's recognized that resistance training can enhance muscular performance. Many studies have proved that better performance can be achieved by the following the resistance training method. It is also said that you can reach the top level performance in a short time.

Correspondence
Dr.D.Gokulakrishnan,
E-mail: gogulakrishnan1@yahoo.co.in, Ph: 076670 24252

Performing the actual skill with some amount of resistance is called as resistance training. This can be practiced daily which improves the specific strength of the particular muscle groups for a better performance in strength, endurance, explosive power, speed and flexibility.

Statement of the Problem

The purpose of the study was to investigate the effect of progressive resistance training programme on selected physical fitness components among college men.

Hypothesis

It was hypothesised that, the effect of progressive resistance training programme may improve the selected physical fitness components among college men.

Methodology

To achieve the purpose thirty students were selected at random from Selvam Educational Institutions, Namakkal. Age ranged between 18 - 25 years for this study. The subjects were divided into two equal groups. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (n=30) were randomly assigned to two equal groups of fifteen subjects each. The groups were assigned as resistance training group (RTG) and control group (CG) in an equivalent manner. The experimental group underwent progressive resistance training programme for a period of eight weeks for a prescribed schedule. The strength, endurance, explosive power, speed and flexibility were selected as criterion variables. 1RM bench press, sit ups, vertical jump, 50 meters run and sit and reach tests were used respectively.

Analysis of Data and Interpretation of the Study

For analyzing the data Analysis of co variance (ANCOVA) was applied to determine whether the training programme produced significantly different improvements in selected variables after eight weeks of training. The group mean gains recorded by the various groups during the experimental period of eight weeks to the criterion measures were tested for the significance by applying 't' test. In all the cases 0.05 level of confidence will be utilized which was considered as an appropriate.

Table 1. Summary of 't' ratio on selected variables of control group

S. No	Variables	Pre Test mean ± σ	Post test mean ± σ	Mean difference	σDM	't' ratio
01	Strength	37.47 ± 3.72	38.2 ± 4.69	0.73	0.74	0.99
02	Endurance	34.73 ± 6.18	35.33 ± 5.66	0.6	0.64	0.94
03	Explosive Power	38.26 ± 1.88	38.53 ± 2.03	0.27	0.20	1.35
04	Speed	7.18 ± 0.325	7.17 ± 0.33	0.64	0.01	0.33
05	Flexibility	4.93 ± 0.93	5.06 ± 0.85	0.13	0.09	1.41

An examination of table-1 indicates that the obtained 't' ratios were 0.99, 0.94, 1.35, 0.33 and 1.14 for strength, endurance, explosive power, speed and flexibility respectively. The obtained 't' ratios on all the selected variables were found to be lesser than the required table value of 2.14 at 0.05 level of significance for 1, 14 degrees of freedom. So it was found to be insignificant.

Table II. summary of't' ratio on selected variables of progressive resistance training group

S. No	Variables	Pre Test mean ± σ	Post test mean ± σ	Mean difference	σDM	't' ratio
01	Strength	39.53 ± 4.097	48.2 ± 3.92	8.67	0.31	28.15*
02	Endurance	31.87 ± 4.43	39.33 ± 4.94	7.46	0.56	13.24*
03	Explosive Power	38.00 ± 2.97	42.33 ± 2.96	4.33	0.05	79.61*
04	Speed	7.25 ± 0.39	6.36 ± 0.47	0.89	0.07	13.10*
05	Flexibility	4.6 ± 1.08	6.67 ± 1.01	2.16	0.10	20.59*

An examination of table-2 indicates that the obtained't' ratios were 28.15, 13.24, 79.61, 13.10 and 17.66 for strength, endurance, explosive power, speed and flexibility respectively. The obtained't' ratios on all the selected variables were found to be greater than the required table value of 2.14 at 0.05 level of significance for 1, 14 degrees of freedom. So it was found to be significant. Hence the hypothesis was accepted.

Table III. Analysis of variance on pre-test, post-test and analysis of covariance on post-test means of progressive resistance training programme (PRTPG) group and control group (CG)

STRENGTH							
TEST	**PRTPG**	**CG**	**SOV**	**SS**	**DF**	**MS**	**F**
Pre Test	39.53	37.47	**Between**	32.03	1	32.033	1.95
SD	4,097	3.72	**Within**	459.47	28	16.41	
Post Test	48.20	38.20	**Between**	750.00	1	750.00	37.45
SD	3.92	4.69	**Within**	560.80	28	20.03	
Adjusted Post Test	47.26	39.14	**Between**	462.26	1	462.26	69.14
			Within	180.524	27	6.69	
ENDURANCE							
Pre Test	31.87	34.73	**Between**	61.63	1	61.633	1.99
SD	4.43	6.18	**Within**	866.67	28	30.95	
Post Test	39.33	35.33	**Between**	120.00	1	120.00	3.97
SD	4.94	5.66	**Within**	846.67	28	30.24	
Adjusted Post Test	40.60	34.06	**Between**	299.21	1	299.21	48.12
			Within	167.872	27	6.22	
EXPLOSIVE POWER							
Pre Test	38	38.27	**Between**	0.53	1	0.533	0.08
	2.97	1.88	**Within**	184.93	28	6.60	
Post Test	42.33	38.53	**Between**	108.30	1	108.30	15.71
	2.96	2.03	**Within**	193.07	28	6.90	
Adjusted Post Test	42.46	38.40	**Between**	123.15	1	123.15	165.69
			Within	20.068	27	0.74	
SPEED							
Pre Test	7.246	7.18	**Between**	0.04	1	0.035	0.26
SD	0.39	0.325	**Within**	3.82	28	0.14	
Post Test	6.36	7.17	**Between**	5.01	1	5.01	28.66
SD	0.47	0.33	**Within**	4.89	28	0.17	
Adjusted Post Test	6.34	7.19	**Between**	5.36	1	5.36	35.61
			Within	4.065	27	0.15	
FLEXIBILITY							
Pre Test	4.60	4.93	**Between**	0.83	1	0.833	0.76
SD	1.08	0.93	**Within**	30.53	28	1.09	
Post Test	6.67	5.07	**Between**	19.20	1	19.20	20.47
SD	1.01	0.85	**Within**	26.27	28	0.94	
Adjusted Post Test	6.79	4.95	**Between**	24.74	1	24.74	64.74
			Within	10.319	27	0.38	

An examination of table - 3 indicated that the results of ANOVA for pre test scores of the progressive resistance training programme and control group. The obtained F-ratio for the pre-tests on strength, endurance, explosive power, speed and flexibility was 1.95, 1.99, 0.08, 0.26 and 0.76 respectively. It was found to be less than the required 'F' ratio of 4.20. By this it was inferred that the mean difference among the two groups at pre-test on strength, endurance, explosive power, speed and flexibility was statistically insignificant. Thus the in Significant F- ratio found in the pre-test mean differences provided a confidence that the samples hailed from same population and devoid of sampling bias.

In the post-test data analysis, the progressive resistance training programme and control group on muscular strength, explosive power, speed, and flexibility. The obtained F- ratio for the post-test was 37.45, 3.97, 15.71, 28.66, and 20.47. The F-ratio needed for significant differences on the mean, for degrees of freedom 1, 28 was 4.20 at 0.05 level of confidence. Since the observed F-ratio on this variable was found to be higher than the F- ratio needed for significance, it was inferred that the mean differences among the two groups on the strength, endurance, explosive power, speed and flexibility used in the study at the end of the treatment period was statistically significant.

The preliminary aim of the analysis of covariance is adjusting the post-test means for the differences in the pre-test means, and adjusted means were tested for significance. The F-ratio obtained from the testing the adjusted post-test means among the two groups' namely progressive resistance training programme and control group on strength, endurance, explosive power, speed and flexibility was 69.14, 48.12, 165.69, 35.61and 64.74.

The obtained F- ratio on strength, endurance, explosive power, speed and flexibility among the two groups was statistically significant since they exceeded the needed F- ratio (4.21) for degree of freedom 1 and 27, at 0.05 level of confidence. From this it was concluded that the strength, endurance, explosive power, speed and flexibility was significantly influenced by the treatments used in this study. Thus the formulated hypothesis was accepted.

Result of the study revealed that there was a significant improvement on the strength, endurance, explosive power, speed and flexibility due to the progressive resistance training programme.

Discussion on Findings

From the result of the study due to the training programme experimental group increased in the strength 21.93%, endurance 23.41%, explosive power 11.39%**,** speed 12.27% and flexibility 46.95% at the end of the treatment. From the findings of the study it was concluded that there was a significant difference in strength, endurance, explosive power, speed and flexiblity between experimental group and control group due to the training. The result of the study is in line with the W. M.Teng, et al (2008) is concluded that the prescribed resistance training was able to elicit a significant increase in some of the physical fitness variables. Ali Akbar Sadeghi (2011), N.N. Toskovic, D. Blessing and H.N. Williford and M.A. Suzana and W. Pieter who found out that there is an increase of strength, endurance, explosive power, speed and flexibility due to the training programme.

Conclusions

The following conclusions were drawn with in the limitations identified and the subjects' performance in tests.

1. The progressive resistance training was significantly effective in enhancing the physical fitness components among college men.
2. The control group did not exhibit any significant change in the physical fitness components among college men.

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