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Effects of Varied Loads of Resistance Training on Selected Strength Parameters

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Abstract

The purpose of the study was to find out the effects of varied loads of resistance training on selected strength parameters namely leg strength and strength endurance. To achieve this purpose of the study, forty five men students studying in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamil Nadu and India were selected as subjects at random. Their age ranged between 18 to 24 years. The selected subjects were divided into three equal groups of fifteen each namely progressive resistance training group, fluctuated resistance training group and control group. The experimental group I underwent progressive resistance training, group II underwent fluctuated resistance training for three days per week for twelve weeks whereas the control group maintained their daily routine activities and no special training was given to them. The following strength parameters namely leg strength and strength endurance were selected as criterion variables. The subjects of the three groups were tested on selected strength parameters namely leg strength and strength endurance using standardized tests namely leg lift with dynamometer and bent knee sit-ups at prior and immediate after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significant difference, if any among the groups. Whenever the obtained "F" ratio was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean difference,, if any. The .05 level of confidence was fixed to test the level of significance which was considered as an appropriate. The results of the study showed that there was a significant difference exist among progressive resistance training group, fluctuated resistance training group and control group on selected strength parameters namely leg strength and strength endurance. And also progressive resistance training group and fluctuated resistance training group showed significant improvement on leg strength and strength endurance when compared to control group.

Keywords: Progressive resistance training, fluctuated resistance training, leg Strength, strength endurance, analysis of covariance (ANCOVA).

Introduction

Today life mostly depends upon science technology. In such circumstance people need more exercise to keep the body and mind fit to execute the activity efficiently. Sport is the way which we use our physical capacities to play. Sports is an important in other ways, when one's body works better his mind works better, his brain and his body are interrelated. Sports allows you to blow of tension, to forget your problems for a while and to go out and have a good time no matter what other pressures one may be under in his life.

Methodology

The purpose of the study was to find out the effects of varied loads of resistance training on selected strength parameters namely leg strength and strength endurance. To achieve this purpose of the study, forty five men students studying in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamil Nadu and India were selected as subjects at random. Their age ranged between 18 to 24 years. The selected subjects were divided into three equal groups of fifteen each namely progressive resistance training group, fluctuated resistance training group and control group. The experimental group I underwent progressive resistance training, group II underwent fluctuated resistance training for three days per week for twelve weeks whereas the control group maintained their daily routine activities and no special training was given to them. The following strength parameters namely leg strength and strength endurance were selected as criterion variables. The subjects of the three groups were tested on selected strength parameters namely leg strength and strength endurance using standardized tests namely leg lift with dynamometer and

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bent knee sit-ups at prior and immediate after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significant difference, if any among the groups. Whenever the obtained "F" ratio was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean difference, if any. The .05 level of confidence was fixed to test the level of significance which was considered as an appropriate. During the training period, the Group I underwent progressive resistance training and Group II underwent fluctuated resistance training for three days per week (alternative days) for twelve weeks. Every day the workout lasted for 45 to 60 minutes approximately including warming up and warming down periods. Group III acted as control who did not participate in any strenuous physical exercises and specific training throughout the training period. However, they performed activities as per their curriculum.

Analysis of Data

The analysis of covariance on selected strength parameters of progressive resistance training group and fluctuated resistance training group and control group have been analyzed and presented below,

Results

Table 1. Analysis of covariance of the data on leg strength of pre and post tests scores of progressive resistance training fluctuated resistance training and control groups

Test	Progressive Resistance Training group	Fluctuated Resistance Training group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	94.33	94.60	94.87	Between	2.13	3	0.71	0.30
S.D.	1.58	1.54	1.36	Within	100.67	42	2.40	
Post Test								
Mean	98.60	96.67	95.07	Between	93.91	3	31.30	21.25*
S.D.	0.61	1.45	1.29	Within	61.87	42	1.47	
Adjusted Post Test								
Mean	98.77	96.67	94.89	Between	103.36	3	34.45	52.10*
				Within	27.11	41	0.66	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The adjusted post-test means of progressive resistance training group, fluctuated resistance training group and control group are 98.77, 96.67 and 94.67 respectively. The obtained "F" ratio of 52.10 for adjusted post-test means is greater than the table value of 3.226 for df 1 and 42 required for significance at .05 level of confidence on leg strength. Since, three groups were compared whenever the obtained "F" ratio for the adjusted post test was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean differences, if any and it was presented in table II.

Table II. The scheffe's test for the differences between paired means on leg strength

Progressive Resistance Training Group	Fluctuated Resistance Training Group	Control Group	Mean differences	Confidence interval value
98.77	96.67	-	2.10*	1.12
98.77	-	94.67	4.10*	1.12
-	96.67	94.67	2.00*	1.12

* Significant at .05 level of confidence.

The table II showed that the mean difference values between progressive resistance training group and fluctuated resistance training group, progressive resistance training group and control group and fluctuated resistance training group and control group on leg strength were 2.10, 4.10 and 2.00 respectively which were greater than the required confidence interval value 1.12. The results of the study showed that there was a significant difference between progressive resistance training group and fluctuated resistance training group, progressive resistance training group and control group and fluctuated resistance training group and control group on leg strength.

Table III. ANCOVA for the pre and post tests scores on strength endurance among progressive resistance, fluctuated resistance and control group

Test	Progressive Resistance Training group	Fluctuated Resistance Training group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	35.40	35.27	35.13	Between	0.53	3	0.18	0.13
S.D.	0.80	1.12	1.41	Within	58.27	42	1.39	
Post Test								
Mean	40.13	36.33	35.33	Between	192.40	3	64.13	55.65*
S.D.	0.50	1.01	1.40	Within	48.40	42	1.15	
Adjusted Post Test								
Mean	40.02	36.63	35.45	Between	173.00	3	57.67	262.83*
				Within	9.00	41	0.22	

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The adjusted post-test means of progressive resistance training group fluctuated resistance training group and control group are 40.02, 36.63 and 35.45 respectively. The obtained "F" ratio of 262.83 for adjusted post-test means is greater than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on strength endurance. Since, three groups were compared whenever the obtained "F" ratio for the adjusted post test was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean differences, if any and it was presented in table IV.

Table IV. The scheffe's test for the differences between paired means on strength endurance

Progressive Resistance Training Group	Fluctuated Resistance Training Group	Control Group	Mean differences	Confidence interval value
40.02	36.63	-	3.39*	1.29
40.02	-	35.45	4.57*	1.29
-	36.63	35.45	1.18*	1.29

* Significant at .05 level of confidence.

The table IV showed that the mean difference values between progressive resistance training group and fluctuated resistance training group, progressive resistance training group and control group and fluctuated resistance training group and control group on strength endurance were 3.39, 4.57 and 1.18 respectively which were greater than the required confidence interval value 1.29. The results of the study showed that there was a significant difference between progressive resistance training group and fluctuated resistance training group, progressive resistance training group and control group and fluctuated resistance training group and control group on strength endurance.

Conclusions

1. The results of the study showed that there was a significant difference among progressive resistance training group, fluctuated resistance training group and control group on leg strength and strength endurance.
2. And also it was showed that there was a significant improvement on leg strength and strength endurance due to progressive and fluctuated resistance training. Progressive resistance training was better than fluctuated resistance training.

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