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Effect of regressive and progressive resistance training on selected anthropometric and biomotor variables

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Abstract
The purpose of the study was to find out the effect of varied intensity of resistance training on selected, biomotor and anthropometric variables. To achieve the purpose of the study, 15 untrained students from the Department of Physical Education and Sports Sciences, Annamalai University were selected at random as subjects from volunteers, in the age group of 18 to 20 years. The selected subjects neither have the experience of organised fitness training nor participating in any other special coaching programme.
The chosen subjects were randomly assigned of 15 each. underwent varied intensity resistance training, To examine the effect of varied intensity resistance training on motor abilities and anthropometric variables, analysis of covariance (ANCOVA) was computed. In determining the level of significance 0.05 was fixed. The finding of the study shows that significant difference existed between control and experimental groups on leg strength and thigh girth.

Keywords: Regressive resistance, progressive resistance, anthropometric variables, biomotor variables

Introduction

Selection of Variables

Experimental Variables

The experimental variables used in the present study is
a. Regressive resistance training
b. Progressive resistance training

Criterion Variables

The criterion variables chosen for the present research were biomotor abilities, anthropometric variables

Biomotor variable

a. Leg Strength

Anthroometric variables

a. Thigh girth

Regressive intensity

40% of 1RM for loaded exercises, for pulse rate between 140 to 160 beats per minute. This confirmed the regressive intensity training.

Pogressive intensity

50% of 1RM for loaded exercises, for the pulse rate between 155 to 170 beats per minute. This confirmed the Pogressive intensity training.

Varied intensity resistance training

In both the training regimens, the subjects under went loaded exercises for 10 stations. The subjects performed the prescribed exercises for the fixed duration at each station. The percentage for 1RM for loaded exercise for regressive and progressive training ranged between 40 to 50 and 50 to 60 respective.

Experimental protocol

Training Period

The experimental groups I and II were subjected to eight weeks of regressive and progressive resistance training programmes respectively. Training was given during alternative days for three days a week for both experimental groups. The programme was scheduled for one session per day in the morning between 6.30 and 8.00 am. During every session the workout lasted approximately for 90 minutes inclusive of warming up, training and warm down process. Circuit training was given under the direct supervision of the investigator. The control group did not participated in any of the circuit training programme. All the criterion variables were tested for three groups prior and after the training period.

Administration of Tests

Biomotor Abilities

Leg Lift with Dynamometer

Purpose

To quantify the maximum strength of the leg muscles.

Testing Procedure

The back and leg dynamometer was kept on a platform to have clear vision on the dial. The subject stood erect on the base of the dynamometer, with hands in front of the thighs. The feet were placed parallel about six inches apart and body weight was equally balanced on both feet. The knees were flexed between 115 and 125 degrees. The bar was placed at top of the thigh and grasp firmly at the ends with pronated grip. The experienced tester hooked the chain according to the height of the subject. The arms and back were straight, the head erect and chest up throughout the lift. The subject pushes down with legs attempting to straighten the legs steadily without jerking. The maximum lift occurred when the subject's legs were straight. Whenever any deviations from proper procedures were noticed, the test was repeated. For each subject the test was administered three times with adequate rest in between.

Scoring

As instructed in the back and leg dynamometer, the score shown in the dial during the maximal lift, was multiplied by two to arrive at the final score. The best of three trails was recorded in kilograms.

Thigh girth

Subject stand erect with his hands away from his body and feet placed slightly apart to allow the free movement of tape between the medial surfaces of the thigh. Measure the girth at the largest part of the thigh without constriction and with the tape placed horizontally little below the gluteus fold.

Scoring

Girth is measured in centimeters John Garretti & Kennet Kennedy.

Statistical Technique

To examine the effect of varied intensity resistance training on motor abilities and anthropometric variables, analysis of covariance (ANCOVA) was computed. In determining the level of significance 0.05 was fixed.

Table 1: Analysis of Covariance for Pre and Post Tests Data on Thigh Girth and legstrength of Control and Experimental Groups

Control Group		Intensive Circuit Weight training Group	Extensive Circuit Weight Training Group	S o V	Sum of Squares	Df	Mean Square	F Ratio
Pretest of Thigh girth								
M	58.60	58.53	58.53	B	0.04	2	0.02	0.01
SD	1.84	1.06	1.06	W	79.06	42	1.88	
Post test of Thigh girth								
M	58.60	64.33	61.67	B	246.93	2	123.46	64.60*
SD	1.84	1.17	0.97	W	80.26	42	1.91	
Adjusted post Test of Thigh girth								
M	58.55	64.35	61.68	B	252.47	2	126.23	648.47*
				W	7.98	42	0.195	
Pretest of Leg strength								
M	92.33	91.53	92.26	B	5.91	2	2.95	0.121
SD	5.47	4.43	4.87	W	1028.00	42	24.47	
Post test of Leg strength								
M	99.27	103.86	94.13	B	711.24	2	355.62	21.509*
SD	5.19	3.42	3.68	W	694.40	42	16.53	
Adjusted post Test of Leg strength								
M	99.04	104.26	93.96	B	792.89	2	396.45	21.336*
				W	76.18	41	1.86	

The required table value for significance at 0.05 level of confidence with degrees of freedom 2 and 41 is 3.226 and degree of freedom 2.

Result and Discussion

The descriptive analyses of data collected on selected biomotor ability and anthropometric variable prior to and after eight weeks of varied resistance training is presented in table 1. The findings of the study show that significant difference existed between both control and experimental groups on leg strength ,and thigh girth.

The finding of the study shows that significant difference existed between control and experimental groups on leg strength and thigh girth since the obtained 'F' ratio of 64.60, 648.47, 21.509 and 21.336 respectively were greater than the required table value of 3.22,3.226 for significance of 2and 41.

It appears that the regular regular practice of physical exercises initiate a disruption in the systemic homoeostasis, which is followed by an adaptive phase results in the betterment of performance of leg strength and thigh girth is due progressive loading of intensity.

A conditioning programme of progressive resistance training can improve power performance (Blacky and Southard 1987; Adams *et al.,* 1992; Bauer *et al.,* 1990) [4, 1, 3].

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