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Effects of isotonic exercise and isometric exercise on leg strength

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Abstract

The purpose of the study was to find out the effects of isotonic and isometric training on leg strength. To achieve this purpose of the study, forty five men students in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamil Nadu, India were selected as subjects at random. The selected subjects were divided into three equal groups of fifteen subjects each, such as isotonic exercise and isometric training, and control group. The group I underwent isotonic training programme, Group-II underwent to isometric training for three days per week for twelve weeks. And Group III acted as control group who did not participate any special training programmes apart from their regular physical education activities as per their curriculum. The following variable namely Leg Strength was selected as criterion variable and it was measured by using leg lift with dynamometer. All the subjects of three groups were tested on selected criterion variable at prior to and immediately after the training programme. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between isotonic and isometric training group and control group on leg strength. And also it was found that there was a significant improvement on leg strength due to isometric and isotonic.

Keywords: Isotonic Training, Isometric Training and Leg Strength.

1. Introduction

Training in sports is essentially on education process. The athlete is instructed and educated by the trainers the physical education teachers and coaches. Training depends upon the various aspects and is a positive quality closely related to exercise and good health habits. It is an important and valuable pulse in modern society. For the last few decades, research has been conducted to develop a better training method to improve motor fitness components.

2. Methodology

The purpose of the study was to find out the effects of isotonic and isometric training on leg strength. To achieve this purpose of the study, forty five men students in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamil Nadu, India were selected as subjects at random. The selected subjects were divided into three equal groups of fifteen subjects each, such as isotonic exercise and isometric training, and control group. The group I underwent isotonic training programme, Group-II underwent to isometric training for three days per week for twelve weeks. And Group III acted as control group who did not participate any special training programmes apart from their regular physical education activities as per their curriculum. The following variable namely Leg Strength was selected as criterion variable and it was measured by using leg lift with dynamometer. All the subjects of three groups were tested on selected criterion variable at prior to and immediately after the training programme. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate.

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Table 1: Analysis of Covariance of the Data on Leg Strength of Pre and Post Tests Scores of Isotonic and Isometric Training and Control Groups

Test	Isotonic training group	Isometric training group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	90.83	90.84	90.86	Between	0.01	2	0.005	0.10
S.D.	0.214	0.237	0.221	Within	2.27	42	0.05	
Post Test								
Mean	95.88	92.82	90.87	Between	191.4	2	95.70	187.65*
S.D.	0.209	0.265	0.220	Within	21.43	42	0.51	
Adjusted Post Test								
Mean	95.46	91.92	90.84	Between	169.17	2	84.59	56.39*
				Within	61.42	41	1.50	

The adjusted post-test means of isotonic training group, isometric training group and control group are 95.46, 91.92 and 90.84 respectively. The obtained 'f' ratio of 56.39 for adjusted post-test means is more than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on leg strength.

The results of the study indicated that there was a significant difference between the adjusted post-test means of isotonic training group, isometric training group and control group on leg strength.

Table 2

Isotonic Training group	Isometric Training group	Control Group	Mean Differences	Confidence Interval Value
95.46	91.92	-	3.54*	1.04
95.46	-	90.84	4.62*	1.04
-	91.92	90.84	1.08*	1.04

The table 2 shows that the mean difference values between isotonic training group and isometric training group, isotonic training group and control group and isometric training group and control group 3.54, 4.62 and 1.08 respectively on leg strength which were greater than the required confidence interval value 1.04 for significance.

The results of this study showed that there was a significant difference between isotonic training group and isometric training group, isotonic training group and control group and isometric training group and control group on leg strength.

3. Conclusions

1. There was a significant difference among isotonic training, isometric training and control groups on leg strength.
2. There was a significant improvement on selected criterion variable due to isotonic training and isometric training. However, the improvement on selected criterion variable were in favour of isotonic training.

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