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Outcomes of Different Speed Training on Leg Explosive Power

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ABSTRACT

The intention of the study was to find out the outcomesof different speed training on leg explosive power. To achieve this point of the study, sixty untrained college men students of St. Joseph's First Grade College, Mysore, were selected as subjects at random and their age were ranged between 17 to 21 years. The selected subjects were divided in to four equal groups of fifteen subjects each. Group I underwent interval training (EXP.I), Group II underwent repetition training (EXP.II), Group III underwent acceleration training (EXP.III) for three days per week for twelve weeks and Group IV acted as control that did not take part in any training. Leg explosive power was selected as criterion variable. The analysis of covariance was used to analyze the significant difference, if any among the groups. Since, four groups were compared, whenever they obtained 'F' ratio for adjusted post-test was found to be significant, the Scheffe's test to find out the paired mean differences, if any. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance.

Keywords: Interval Training, Repetition Training, Acceleration Training And Leg Explosive Power

INTRODUCTION

Speed is quintessential for most of the sporting events and needless to say that a vast majority of the sportspersons have to run, move, react or change direction instantaneously. Speed essentially incorporates three elements, and they are the following viz., reaction time (the motor reaction to a signal), movement time (the ability to move a limb quickly, as in martial arts, batting or passing a ball) and the speed of running (including the frequency of arm and leg movement). Many sports specialists believe that sprinters are born and not made, because speed is determined genetically, depending on the type of muscle composition of an athlete. The higher the proportion of fast twitch muscle fibers, the faster the reaction and the more powerful the muscle contraction. Although speed is determined genetically, it is not the only determinant; there are also other ways and means by which speed could be developed adopting various training methods.

The **Repetition training** involves several repetitions of sprints over distances between 60 and 220 yards at absolute maximum speed. Because the heart beats so fact (around 200 beat/min or higher) during this type of training, a heart expansion stimulus does not normally take place since the heart does not fill to its maximum during the diastolic or resting period. As a result, an increased stroke volume of the heart is not generally produced. Instead, the primary effect of sprint training is the development of the ATP-CP energy system.

The **Interval training** is a type of discontinuous physical training that involves a series of low- to high-intensity exercise workouts combined with rest or relief periods. The high-intensity periods are typically

at or close to anaerobic exercise, while the recovery periods involve activity of lower intensity. Interval training can be described as short periods of work followed by rest. The main aim is to improve speed and cardiovascular fitness[2], it consists of sprinting for 50 yards and jogging for 60 yards after each for distances up to 3 miles. In other words, for each 440 yards, the athlete would combine four 50-yards sprints with four 60-yards jogs.

The **Acceleration training** develops almost exclusively speed and strength. It involves 50 to 110 yards of jogging. Followed by 50 to 110yards of fast striding, and finally 50 to 110 yards of sprinting, following a recovery (via walking) distance of 50 to 110 yards, the procedure should be repeated. All competitive sports rely on power for success. It is useful to understand that the components of power include strength (force) and velocity. In order to become more powerful, athletes must be strong enough to generate the necessary power for success. Once they have adequate strength, athletes must train to use that strength at the velocities necessary in competition[4]. In this study an attempt is made to find out the effect of different sprint training on Leg Explosive Power. The rate of force development is at the maximum for any type of muscle action is called as explosive power[5].

METHODS AND TOOLS

To achieve this purpose of the study, sixty untrained healthy college men students of St. Joseph's First Grade College, Mysore, were selected as subjects at random and their age were ranged between 17 to 21 years. The selected subjects were divided in to four equal groups of fifteen subjects each. Group I underwent Interval Training, Group II underwent Repetition Training and Group III underwent Acceleration Training for three days per week for twelve weeks. Group IV acted as control that did not participate in any training. Leg explosive power was selected as criterion variable. All the subjects of four groups were tested on Leg explosive power at prior to and immediately after the training programme. Leg explosive power tested through standing broad jump test.

TRAINING PROGRAMME

The experimental groups I, II and III were subjected to twelve week of Interval Training, Repetition Training and Acceleration Training of different sprint training respectively. The control group was not exposed to any training. Then training was given for three days per week (alternative days). The training program was scheduled between 6.30 am and 8.00 am. The subjects underwent their respective programme. Intensity is the effort involved in performing a given task. In the Sprint training, intensity is controlled by the rate of exercise performed. Training load was fixed with the application of progressive method. The Intensity of different sprint training can be increased by the fluctuation of repetition and sets of exercise.

TABLE-I COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PRE-TEST, POST TEST AND ADJUSTED POST TEST ON LEG EXPLOSIVE POWER OF DIFFERENT EXPERIMENTAL AND CONTROL GROUPS

Test	Acceleration Training Group	Repetition Training Group	Interval Training Group	Control Group	Source of Variance	Sum of Squares	Df	MS	'F' Ratio
Pre-test Mean	33.13	32.60	32.20	33.27	Between	10.93	3	3.64	1.52

S.D.	1.46	1.06	1.42	2.09	Within	134.67	56	2.40	
Post Test Mean	35.13	33.93	33.27	29.00	Between	320.73	3	106.91	71.62*
S.D.	1.46	0.80	1.22	1.31	Within	83.60	56	1.49	
Adjusted Post Test Mean	34.91	34.07	33.67	28.69	Between Within	349.43 24.07	3 55	116.48 0.44	266.11*

* Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence for 3 and 56 and 3 and 55 are 2.78 and 2.77 respectively).

The obtained pre-test F value of 1.52 was lesser than the required table F value of 2.78. The obtained post-test F value of 71.62 was greater than the required table F value of 2.78. Hence the post-test means values of explosive power show significant at 0.05 level of confidence for the degrees of freedom 3 and 56. The obtained adjusted post-test F value of 266.11 was greater than the required Table F value of 2.77. Hence the adjusted post-test means values of explosive power show significant at 0.05 level of confidence for the degrees of freedom 3 and 55. Since the observed F value on adjusted post-test mean among the groups such as on explosive power produced significant improvements among the three groups.

In order to find out which intervention programmes used in the present study was the source for the significance of adjusted mean was tested by Scheffe's post hoc test. Since, three groups were compared, the obtained 'F' ratio for adjusted post-test was found to be significant, the Scheffe's test to find out the paired mean differences and it was presented in

TABLE II SCHEFFE'S POST HOC TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST PAIRED MEAN ON LEG EXPLOSIVE POWER

(Scores in meters)

Acceleration Training Group	Repetition Training Group	Interval Training Group	Control Group	Mean Differences	Confidence Interval Value
34.91	34.07	-	-	0.85*	0.85
34.91	-	33.67	-	1.25*	
34.91	-	-	28.69	6.22*	
-	34.07	33.67	-	0.40	
-	34.07	-	28.69	5.38*	
-	-	33.67	28.69	4.98*	

* Significant at .05 level of confidence.

The table shows the comparison of group 2 and 3 show insignificant improvement on explosive power, because the obtained mean difference value on 0.40 was lesser than the confidential value of 0.85. All the remaining comparisons show significant improvement on the explosive power parameter, because the obtained mean difference values of the comparisons were 0.85, 1.25, 6.22, 5.38 and 4.98 which were higher than the confidential interval value. Hence all the above comparisons were significant at 0.05 levels. The results indicate that for explosive power the Acceleration Sprinting dominated than the

Repetition and Interval Sprinting. Further the Repetition Sprinting was found to be better than the Interval Sprinting. The least improvement was observed in the Interval Sprinting.

DISCUSSION

The results of the study clearly indicated that there were significant differences found among the selected groups and significant improvement was noticed on selected training programme.

CONCLUSION

After the 12 weeks of training programme Acceleration sprint training influenced to a great extent on sprinting performance than the other two trainings and control group. The repetition sprint training also produced enhanced development on the sprinting performance than the interval sprint training and control group. The interval sprint training produced slightest development on sprinting performance. No improvement was found on the control group.

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