

Comparison of Power Training Programmes of Varied Intensities on Speed Related Parameters of Anna University Men Participants

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Abstract

The purpose of the study was to design to compare the power training programmes of varied intensities on speed related parameters of Anna University men Participants. For this purpose, forty men players studying various undergraduate Engineering courses in Government College of Engineering, Salem, Tamil Nadu, India who have participated in the Anna University of Technology, Coimbatore inter collegiate tournaments in the year 2010-2011 were selected as subjects at random, and they were divided randomly into four Experimental groups of ten each, namely Group-I, (Maximal Resistance Training with 60% Intensity) (MRT 60% Intensity), Group-II, (Maximal Resistance Training with 80% Intensity) (MRT 80% Intensity), Group-III, (Plyometric Training with 60% Intensity) (PT 60% Intensity), and Group-IV (Plyometric Training with 80% Intensity) (PT 80% Intensity). The training period was limited to eight weeks and for three days per week. The dependent variables selected for this study were Speed, Stride Length and Speed Endurance. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables. The data obtained from the Experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted posttest means was found to be significant, the Scheffe's test was applied as post-hoc test to determine the paired mean differences. The level of confidence was fixed at .05 level for all the cases. The results of the study showed that there was a significant difference was found among all the experimental groups.

Key words: Maximal resistance training, Plyometric training speed, Stride length and speed endurance.

Introduction

Muscular power is related to muscular strength. One may possess adequate strength, but may not be able to deliver the generated force judiciously on time, and at the particular point of action to advantage. Power is the application of force, per unit time or per unit area of surface. The nature of power application determines the effectiveness of the execution of the skill (**Sundararajan, 1979**).

Resistance training is an anaerobic form of exercise. This training programme can be used to enhance the ability of the body to perform at very high force and / or power outputs for a very short period of time to improve the ability of the body to perform repeated bouts of maximal activity.

The actual term 'plyometrics' was first coined in 1975 by Fred Wilt, the American Track and Field coach. The elements ply and metric come from Latin roots for "increase" and "measure" respectively, the combination thus means 'measurable increase" (**Baechle, 1994**).

Plyometrics became known to coaches and athletes as exercises or drills aimed at linking strength with Speed movement to produce power. Presently many coaches and athletes have successfully used plyometric type exercises chiefly as a method of training to enhance performance through it has potential benefits in improving strength and overall conditioning of the athletes also.

Speed is one of the most important physical qualities required for successful performance in jumps, especially in the horizontal jump and in the pole vault. The amount of speed required is slightly different in the event due to differing emphasis in the take off. It is said that sprinters are born not made but it is certainly true that natural ability always plays a major role in sports events.

Speed is a determining factor in explosive sports (e.g. Sprints, Jumps and most field sport) while in the endurance events its role as a determining factor appears to get reduced with increased distance (Dick,1980).

Methodology

Forty men players studying various undergraduate Engineering courses in Government College of Engineering, Salem, Tamil Nadu, India who have participated in the Anna University of Technology, Coimbatore inter collegiate tournaments in the year 2010-2011 were selected as subjects and their age ranged from 18-21 years. The selected subjects randomly assigned into four groups of ten each, namely, Group-I, (Maximal Resistance Training with 60% Intensity)(MRT 60% Intensity), Group-II, (Maximal Resistance Training with 80% Intensity) (MRT 80% Intensity), Group-III, (Plyometric Training with 60% Intensity) (PT 60% Intensity), and Group-IV (Plyometric Training with 80% Intensity) (PT 80% Intensity). The training period was limited to one hour per day for three days per week for eight weeks. The dependent variables selected for this study were Speed, Stride Length and Speed Endurance. The selected dependent variables were assessed prior to and immediately after the training period. Speed and Stride Length were collected by administering 50 meters Run and that on Speed Endurance were collected by administering 150 meters Run (Seagrave, 1996).

Analysis of the Data

The data collected from the MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. The level of significance was fixed at .05 level of confidence to test the 'f' ratio obtained by analysis of covariance.

Table-I
Summary of Mean and Dependent 'T' Test for the Pre and Post Tests on Selected Criterion Variables of Experimental Groups

Criterion variable	MRT 60% intensity group - (I)			MRT 80% intensity group - (II)			PT 60% intensity group - (III)			PT 80% intensity group -- (IV)		
	Pre test	Post test	t test	Pre test	Post test	t test	Pre test	Post test	t test	Pre test	Post test	t test
Speed	7.04	6.93	9.29*	7.11	7.08	5.01*	7.00	6.64	11.84*	6.97	6.76	11.11*
Stride length	1.65	1.69	6.57*	1.66	1.68	5.66*	1.62	1.73	8.67*	1.66	1.72	6.70*
Speed endurance	6.90	7.06	6.08*	6.90	6.97	4.73*	6.97	7.37	30.65*	6.88	7.18	17.35*

* Significant at .05 level. Table value required for significance at .05 level for 't'-test with df 9 is 2.26

From the Table – I the dependent 't' test value among MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group on Speed, Stride Length and Speed Endurance were 9.29, 5.01, 11.84, 11.11, 6.57, 5.66, 8.67, 6.70, 6.08, 4.73, 30.65 and 17.35 respectively. Since the obtained 't'-test value of the Experimental groups were greater than the table value 2.26 with df 9 at .05 level of confidence, it is concluded that MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group had registered significant improvement in performance of Speed, Stride Length and Speed Endurance.

The analysis of covariance on of Speed, Stride Length and Speed Endurance of MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group have been analyzed and presented in Table – II.

Table-II
Analysis of Covariance on Selected Variable of Experimental Groups

Criterion variable	Adjusted Post-test Means				Source of variance	Sum of squares	df	Mean squares	'F' Ratio
	MRT 60% intensity group (I)	MRT 80% intensity group (II)	PT 60% intensity group (III)	PT 80% intensity group (IV)					
Speed	6.92	7.00	6.67	6.82	Between with in	0.57 0.13	335	0.19 0.0037	51.35*
Stride length	1.69	1.67	1.74	1.71	Between with in	0.02 0.01	335	0.01 0.0003	33.33*
Speed endurance	7.07	6.98	7.32	7.21	Between with in	0.65 0.13	335	0.22 0.004	55.00*

* Significant at .05 level of confidence (The table value required for Significance at .05 level with df 3 and 35 is 2.87)

From table – II, the obtained value of 'f' - ratio for Speed, Stride Length and Speed Endurance, for adjusted post test means were 51.35, 33.33 and 55.00. The obtained 'f' - ratio value of the Experimental groups were greater than the table value of 2.87 for df 3 and 35 required for significant at 0.05 level of confidence. The results of the study indicated that significant differences exist among the adjusted post test means of MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group on the development of for Speed, Stride Length and Speed Endurance.

To determine which of the paired means had a significant difference, Scheffe's test was applied as post hoc test and the results are presented in Table III.

Table-III

The Scheffe's Test for the Differences between the Adjusted Post Test Paired Means on Selected Variable

Adjusted Post-test means					Mean difference	Confidence interval
Criterion variables	MRT 60% intensity group (I)	MRT 80% intensity group (II)	PT 60% intensity group (III)	PT 80% intensity group (IV)		
Speed	6.92	7.00			0.08*	0.08
	6.92		6.67		0.25*	0.08
	6.92			6.82	0.10*	0.08
		7.00	6.67		0.33*	0.08
		7.00		6.82	0.18*	0.08
			6.67	6.82	0.15*	0.08
Stride length	1.69	1.67			0.02*	0.02
	1.69		1.74		0.05*	0.02
	1.69			1.71	0.02*	0.02
		1.67	1.74		0.07*	0.02
		1.67		1.71	0.04*	0.02
			1.74	1.71	0.03*	0.02
Speed endurance	7.07	6.98			0.09*	0.08
	7.07		7.32		0.25*	0.08
	7.07			7.21	0.14*	0.08
		6.98	7.32		0.34*	0.08
		6.98		7.21	0.23*	0.08
			7.32	7.21	0.11*	0.08

Table III shows that the mean difference values of Speed between MRT 60% Intensity group and MRT 80% Intensity group, MRT 60% Intensity group and PT 60% Intensity group, MRT 60% Intensity group and PT 80% Intensity group, MRT 80% Intensity group and PT 60% Intensity group, MRT 80% Intensity group and PT 80% Intensity group, PT 60% Intensity group and PT 80% Intensity group (0.08, 0.25, 0.10, 0.33, 0.18 & 0.15), Stride Length between MRT 60% Intensity group and MRT 80% Intensity group, MRT 60% Intensity group and PT 60% Intensity group, MRT 60% Intensity group and PT 80% Intensity group, MRT 80% Intensity group and PT 60% Intensity group, MRT 80% Intensity group and PT 80% Intensity group, PT 60% Intensity group and PT 80% Intensity group (0.02, 0.05, 0.02, 0.07 0.04 & 0.03), Speed Endurance between MRT 60% Intensity group and MRT 80% Intensity group, MRT 60% Intensity group and PT 60% Intensity group, MRT 60% Intensity group and PT 80% Intensity group, MRT 80% Intensity group and PT 60% Intensity group, MRT 80% Intensity group and PT 80% Intensity group, PT 60% Intensity group and PT 80% Intensity group (0.09, 0.25, 0.14, 0.34, 0.23 & 0.11) respectively, is greater than the confidence interval value (0.08, 0.02 & 0.08) respectively, which was significant at .05 level of confidence.

The mean values of Speed, Stride Length and Speed Endurance of MRT 60% Intensity group, MRT 80% Intensity group, PT 60% Intensity group, and PT 80% Intensity group were graphically represented in the Figure-1, Figure-2 and Figure-3 respectively.

Figure-1
Mean Values of Experimental Groups on Speed

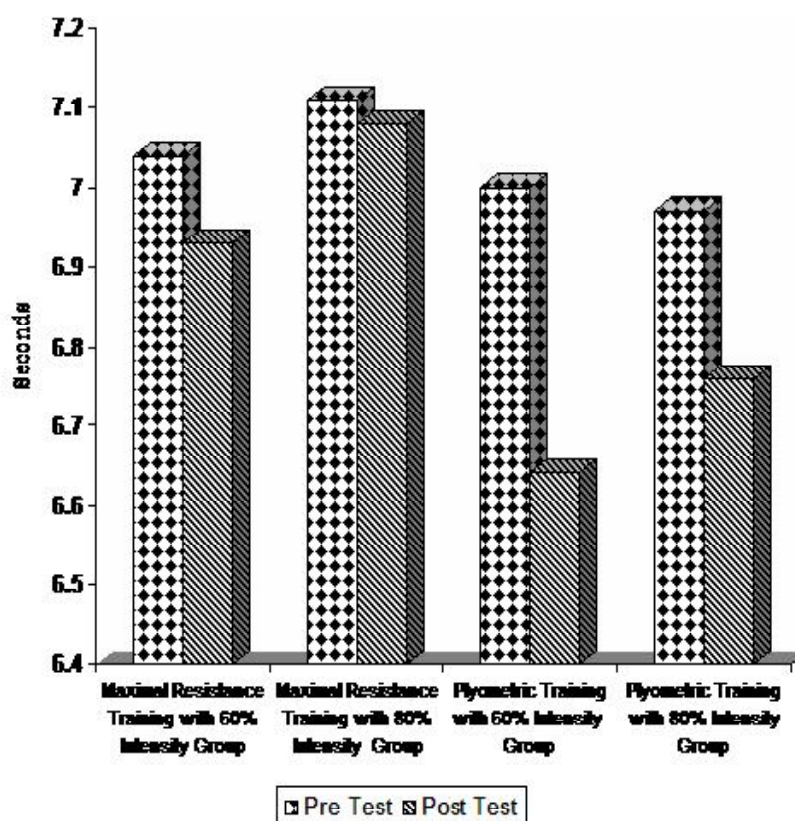


Figure-2
Mean Values of Experimental Groups on Stride Length

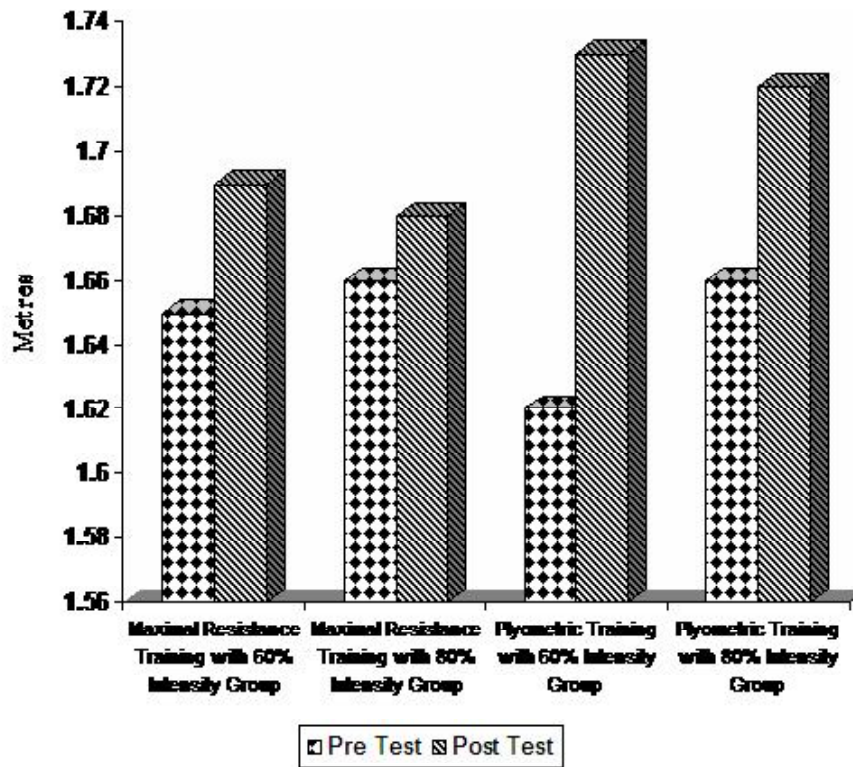
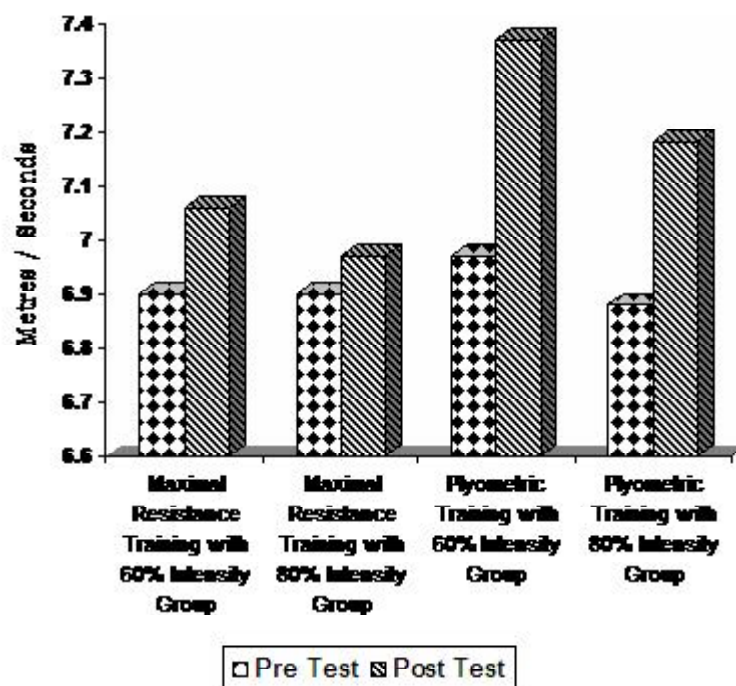


Figure-3
Mean Values of Experimental Groups on Speed Endurance



Results and Discussion

The results of the study indicate that all the experimental groups-namely Maximal Resistance Training with 60% Intensity, Maximal Resistance Training with 80% Intensity, Plyometric Training with 60% Intensity and Plyometric Training with 80% Intensity group had significantly improved in the selected dependent speed related variables namely Speed, Stride Length and Speed Endurance. It is also found that the improvement effected by Plyometric Training in the 60% Intensity group was greater when compared to the effects other Experimental groups.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The Experimental groups namely, Maximal Resistance Training with 60% Intensity, Maximal Resistance Training with 80% Intensity, Plyometric Training with 60% Intensity and Plyometric Training with 80% Intensity groups had significantly improved in speed related variables such as Speed, Stride Length and Speed Endurance.
2. Significant differences in achievement were found among Maximal Resistance Training with 60% Intensity, Maximal Resistance Training with 80% Intensity, Plyometric Training with 60% Intensity and Plyometric Training with 80% Intensity groups in all the selected criterion variables such as Speed, Stride Length and Speed Endurance.
3. Plyometric Training with 60% intensity was found to be better than the other Experimental groups in developing Speed, Stride Length and Speed Endurance.

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