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Impact of Speed Training Combined With Plyometric Training and Intensive Interval Training on Speed Endurance

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Abstract: *The purpose of this present study was to investigate the Impact of Speed training combined with Plyometric training and Intensive interval training on Speed endurance. To achieve thispurpose study 45 male students (N=45) were selected from Andhra Pradesh state, India Junior National level representationAthletes. During the year 2015-16.were selected at random The subject's age, height and weight ranged from 18 to 20 years,165 cm to 175cm ,55kgs to 65 kegs respectively. The selected subjects were divided into three equal groups of 15 subject's each. Group-Iunderwent combined Speed and Plyometric training, group-II underwent combined Speed and Intensive Interval training for six weeks and group-III acted as control was not given any exercise during the training program. The dependent variable selected for the study was Speed endurance measured by 300Mts run.Pre-test was taken before training and post-test was measured after the six weeks training period. The data collected from the groups prior and post experimentation on selected dependent variable was statistically analyzed to find out the significance difference, by applying the analysis of covariance (ANCOVA) and the F ratio was found out. The Scheffe's test was applied as post-hoc test to determine the paired mean difference. The level of significance will be fixed at 0.05 level of confidence for all the cases.*

I. Introduction

At present, Sports activities are classified into several areas such as performance Sports, Physical Education, Rehabilitation Sports, fitness and leisure Sports and adventure Sports.Performance Sports aim at high sports performance and for that the physical, physiological and psychic capacities of sportsmen are developed through various training means and methods. Most physical movements incorporate the elements of force, quickness duration, complexity and range of motion to a certain extent.Further, we can distinguish individual motor aspects and physiological components such as strength, speed, agility, endurance, flexibility and coordination. So training is no more amateur job. The athlete can perfected through the physiological components, commonly known as bio motor abilities before passing the skills. Out of all the bio motor abilities, speed, strength and power are the most critical for many sports. All team sports and individual sports to major role components like speed and strength.In different events have different demands on fitness. To develop specific fitness required for an event it is necessary for the coach to understand the characteristic of the physical fitness and performance fitness components and how to develop them (worthinintong, 1980).

In sprinting, speed endurance becomes important from the point where the development of pure speed begins to slow down to reach its maximum at about 40 seconds, when the main resource of the energy reserves have been used. As this is combined with production of large quantities of lactic acid, speed endurance is the closely related to the ability to tolerate a high level of waste products.Baechle suggested (1994), Speed endurance programmes should be designed with reference to the sports primary energy system, which involves sports duration. Speed endurance is normally enhanced interval training, which involves high intensity exercise bouts alternated with bouts of recovery. Uppal Guatam (2000) suggested speed endurance is the special speed quality that can be using both Pace races and repeated high intensity run.

Purpose of The Study

This study aims at finding out the Impact of Speed training combined with Plyometric training and Intensive interval training on Speed endurance of junior national level Sprinting athletes

II. Methodology

To achieve this purpose study 45 male students (N=45) were selected from Andhra Pradesh state, Junior National level Sprinting Athletes. During the year 2015-16.were selected at random The subject's age, height and weight ranged from 18 to 20 years,165 cm to 175cm ,55kgs to 65 kegs respectively. The selected subjects were divided into three equal groups of 15 subject's each. Group-I underwent combined Speed and Plyometric training, group-II underwent combined Speed and Intensive Interval training for six weeks. The group –I and group- II were treated with their respective training for one hour per day for three days a week for a period of six weeks and group-III acted as control was not given any exercise during the training period. The dependent variable selected for the study was Speed endurance measured by 300 Mts run the time taken one

tenth of second.Pre-test was taken before training and post-test was measured after the six weeks training period.The Impact of Speed training combined with Plyometric training and Intensive interval training on Speed endurance of junior national level Sprinting athletes.

Experimental group-I : Speed training combined with Plyometric training
Experimental group-II : Speed training combined with Intensive interval training

Statistical Techniques

The data collected from the three groups were statistically analyzed for significance, the analysis of covariance (ANCOVA) was used and the F ratio was found out. Hence to make the adjustments for significant difference, the analysis of covariance was used. Since, three grouped were involved, post means, Scheff's post Hoc test was followed to determine which of the paired means difference was significant. In all the cases to test the significance, 0.05 levels of significance were fixed. The data were analyzed by computer using statistical packages.

III. Results and Discussion

Analysis of covariance for the pre-test, post-test and Adjusted posttest mean values for Speed training combined with Plyometric training group and Speed training combined with Intensive interval training group and control groups on Speed endurance.

Analysis of Covariance on Speed Endurance of Experimental and Control Groups

	Speed combined with Plyometric training group	Speed combined with Intensive interval training group	Control group	Source of Variance	Sum of Squares	df	Mean Squares	'F'ratio
Pretest Mean	21.90	21.91	21.99	Between	0.076	2	0.038	0.15
SD	0.47	0.50	0.53	Within	10.51	42	0.25	
Pretest Mean	21.43	21.31	21.89	Between	2.84	2	1.42	5.26*
SD	0.53	0.54	0.43	Within	11.32	42	0.27	
Adjusted	21.46	21.33	21.84	Between	2.10	2	1.05	13.71*
Posttest Mean				Within	3.14	41	0.08	

(The require table value for significance at 0.05 level of confidence with degrees of freedom 2 and 43 is 3.23 and degree of freedom 2 and 41 is 3.22)
*Significant at 0.05 level of confidence.

The above table shows that the pre-test means and Standard deviation on Speed endurance of combined Speed and Plyometric training, combined Speed and Intensive interval training and control groups are 21.90±0.47, 21.91±0.50 and 21.99±0.53 respectively. The obtained F ratio value 0.15 of Speed endurance less than the required table value of 3.23 for the degree of freedom 2 and 42 at 0.05 level of confidence, which proved that the random assignment of the subjects were successful and their scores in speed endurance before the training were equal and their was no significant differences.The post-test means and standard deviation on Speed endurance of combined Speed and Plyometric training, combined Speed and Intensive interval training and control groups are 21.43±0.53, 21.31±0.54 and 21.89±0.48 respectively. The obtained F'ratio value 5.26 of Speed endurance is greater than the required table value of 3.23 for the degree of freedom of 2 and 42 at 0.05 level of confidence. It implies the significant differences existed between three groups during the post test period on Speed endurance.

The Adjusted post- test means on Speed endurance of combined Speed and Plyometric training, combined Speed and Intensive interval training and control groups are 21.46, 21.33 and 21.84 respectively. The obtained F ration value 13.71 of Speed endurance is greater than the required table value of 3.22 for the degree of freedom 2 and 41 at 0.05 level of confidence. Hence, it is concluded that significance differences exist between the adjusted post- test means of combined Speed and Plyometric training, combined Speed and Intensive interval training and control groups on Speed endurance.

Since, the obtained F ratio value in the adjusted post- test means is found to be significant, the Scheffe's S test is applied as post hoc test to find out the paired mean differences, and it is presented below.

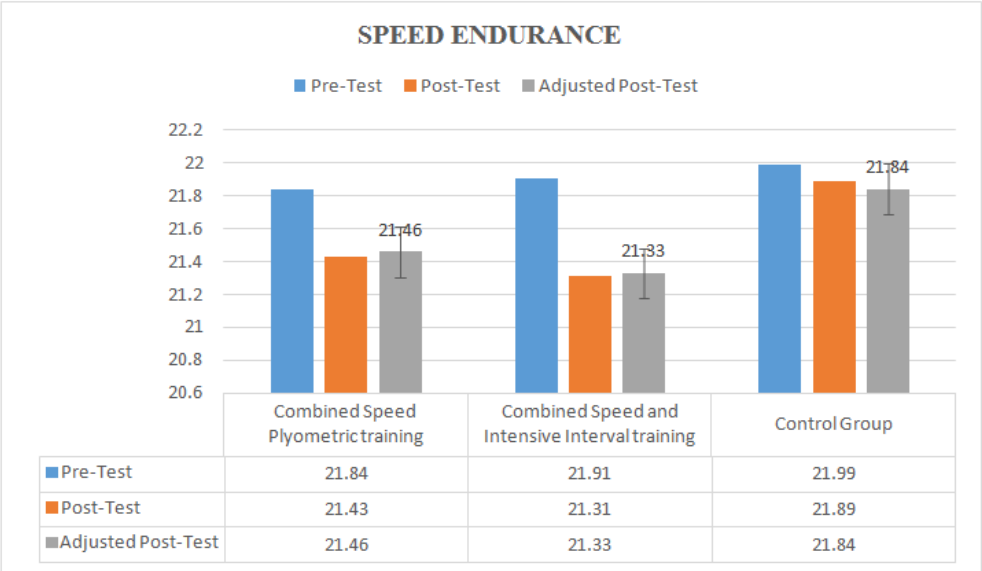
Scheffe's Post Hoc Test for the Differences Among Paired Means of Experimental and Control Groups On Speed Endurance

Speed and Plyometric training Group	Speed and Intensive interval training Group	Control Group	Mean Differences	Confidence Interval
21.46	21.33		0.13	0.26
21.41		21.84	0.43*	0.26
	21.29	21.84	0.55*	0.26

*Significance at 0.05 level

From the above table the Scheffe's post hoc analysis proved that significant mean differences exist between combined Speed and Plyometric training, combined Speed and Intensive interval training and control groups on Speed endurance. Since the mean differences 0.43 and 0.55 are higher than the confident interval value of 0.26 at 0.05 level of significance. However, no significant difference exist between combined Speed and Plyometric training group and combined Speed and Intensive interval training group since, mean difference is 0.13 lesser than the confident interval value of 0.26 at 0.05 level of confidence.

Diagram Showing the Mean Values on Speed Endurance of Experimental and Control Groups



	Combined Speed Plyometric training	Combined Speed and Intensive Interval training	Control Group
Pre-Test	21.84	21.91	21.99
Post-Test	21.43	21.31	21.89
Adjusted Post-Test	21.46	21.33	21.84

IV. Conclusion

Hence, it is concluded that due to the effect of combined Speed and Plyometric training and combined Speed and Intensive interval training the Speed endurance of subjects is significantly improved. It is also concluded that no significant differences exist between combined Speed and Plyometric training and combined Speed and Intensive interval training groups in improved Speed endurance. The pre, post and adjusted post- test mean values of experimental and control groups on Speed endurance is graphically represented above.

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