
Comparative Effect of Isometric and Isotonic Training on Speed of Tennis Players

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Received: 02 November, 2016; **Accepted:** 12 November, 2016; **Published:** 22 November, 2016

Abstract: The purpose of the study was to compare of effect of isometric training and Isotonic training on speed of tennis players .after 10 weeks isometric training and Isotonic training of tennis players (male) of LNIPE to fulfill the objective of the study 10 male tennis player from the tennis match practice of LNIPE (5 in isometric training, 5 in Isotonic training and 5 control group) were selected for the data collection. 50m dash sprint test was used to measures of speed of the subjects. In order to analyze the data ANCOVA was used and investigator observed the significant difference between isometric training program and Isotonic training program among the subjects.

Keywords: Isometric Training, Isotonic Training, Speed.

Introduction:

Tennis is a racquet sport that can be played individually against a single opponent (singles) or between two teams of two players each (doubles). Each player use a racquet that is strung with cord to strike a hollow rubber ball covered with felt over or around a net and into the opponent's court. The object of the game is to play the ball in such a way that the opponent is not able to play a good return. The opponent who is unable to return the ball will not gain a point, while the opposite opponent wills (Wikipedia). They need to develop their motor components. Speed is a one motor component which is more require in tennis. The basic physical fitness elements are muscular strength, muscular power, agility, and speed, and body balance. There are lot of method of training has varied according to the nation's interests, but the traditional method has been the use of Isotonic exercise program.and Isometric.

Tennis player have to run as fast as possible during the tennis match and take all court movement to cover the tennis court, so speed is very important component to take the fast movement in tennis court tennis is a open skill game tennis player the volley and other strokes and come back basic line for hit the ball. Speed is important to work on grooving your strokes. Speed development depends on muscular strength and power. There is lot of method to develop of speed of the players like short distance run, sand run, parachute training, and ply metrics. then isometric training and Isotonic training are good training method to develop speed of tennis player both have different nature of training then I want to find out which one better for develop the speed of tennis players.

Isometric training: isometrics are a type of strength training in which the joint angle and muscle length do not change during contraction (compared to concentric or eccentric contractions, called dynamic/Isotonic movements).

Isotonic training: when a contracting muscle shortens against a constant load, as when lifting a weight. Isotonic exercise is one method of muscular exercise. In contrast, isometric exercise is when muscular contractions occur without movement of the involved parts of the body.

Methodology:

Selection of subjects

A total of 15 subject selected of university level randomly in tennis. 5 subject each group (control group 5, isometric training 5, and Isotonic training 5) the age of the selected subject ranged from 19 to 24 years.

Variables and Tests

Speed was chosen as the alone fitness variable and was tested by the 50m sprint which had the unit second for collected the data of speed

Statistical technique

ANCOVA was used for comparing the isometric training and Isotonic training groups at 0.05 level of significance.

Table: 01

Levene’s Test of Equality of Error Variances for Dependent Variable: Post Speed

F	df1	df2	Sig.
.806	2	12	.470

The Table 01 indicates the outcome of the Levene’s test for equality of error variances for the homogeneity of variances within the groups. In which the significant value in case of the Speed was greater than the level of significant [P>0.05]. So in that case, the assumption of equality of variance for the variable Speed was not violated and it stated that the within group variances were equal.

Table: 02

Adjusted post-test value for Dependent Variable: post speed

group name	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
control group	7.081 ^a	.060	6.949	7.214
Isometric group	6.607 ^a	.061	6.474	6.741
Isotonic group	6.625 ^a	.060	6.492	6.759

a. Covariates appearing in the model are evaluated at the following values: pre speed = 7.0753.

The Table 02 indicates the new adjusted post mean values for the treatment groups after nullifying the effect of initial difference among the treatment groups. The adjusted post mean value for isometric training group is 6.607 and for Isotonic group it is 6.625 whereas for control group it is 6.949. The adjusted mean value of the variable is presented through the following figure:

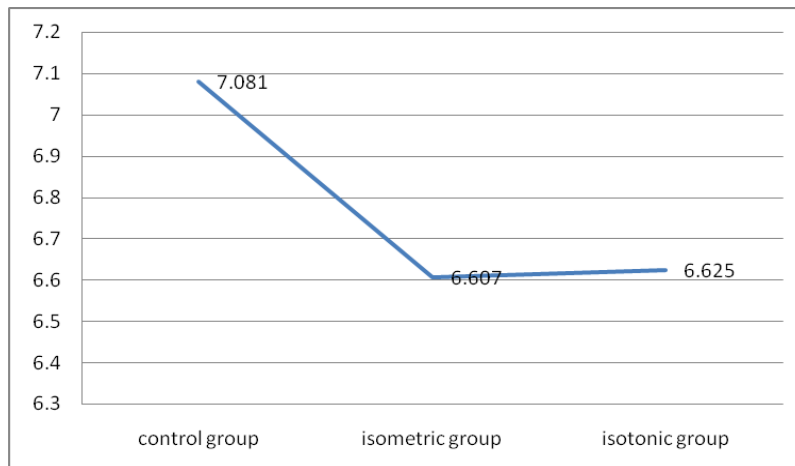


Figure 01: Adjusted mean value for variable Speed

Table: 03

ANCOVA Table for Dependent Variable: Post Speed

Source	Type I Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre speed	.601	1	.601	33.328	.000	.752
Group	.721	2	.361	19.990	.000	.784
Error	.198	11	.018			
Corrected Total	1.521	14				

In the Table 03, it is seen that the significant value of shoulder maximum strength was .000, which was significant at 0.05 level of significant ($P < 0.05$). So it can be concluded that initially there was significant difference in the groups which might affect the main effect of the study. In that case, ANCOVA was the appropriate test for comparing these three groups. On the other hand, the main effect for the groups was significant ($F = 19.990$, $P = 0.000$, $P < 0.05$) and it indicates that there was statistically significant differences between the groups after adjusting the effect of the pre-test.

Table: 04

Pair-Wise Comparisons for Dependent Variable: Post Speed

(I) group name	(J) group name	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
control group	Isometric group	.474*	.085	.001	.233	.715*
	Isotonic group	.456*	.085	.001	.216	.696*
Isometric group	control group	-.474*	.085	.001	-.715	-.233*
	Isotonic group	-.018	.086	1.000	-.261	.225

Isotonic group	control group	-.456*	.085	.001	-.696	-.216*
	Isometric group	.018	.086	1.000	-.225	.261
Based on estimated marginal means						

Since the F value in the previous table is significant, a pair-wise comparison of means has been made by using the Bonferroni correction which is shown in the Table ---. It may be noted that the p value associated with the mean difference between Control and Isometric group is 0.001 and between Control and Isotonic group is 0.001. Both these p values are less than 0.05 and hence the differences are significant at 5% level.

Conclusions:

1. There is a significant difference in the adjusted mean speed of the Isometric and Control groups.
2. There is a significant difference in the adjusted mean speed of the Isotonic and Control groups.
3. There is no significant difference in the adjusted mean speed of the Isometric and Isotonic groups.

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