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## Effect of resistance training on selected physical variables of adolescent male tennis players

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### Abstract

The study was to find out the effect of resistance training on physical variables of adolescent male tennis players. To achieve the purpose of the study, thirty adolescent male tennis players were randomly selected from the National Sports School, Ajjanoor, Coimbatore and their age ranged between 14 and 17 years. The subjects were randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects each as experimental and control group. Group-I underwent resistance training for a period of twelve weeks and group-II acted as control who did not participate in any special training other than routine. The physical variables such as speed, explosive power and flexibility were selected as dependent variables. Speed was tested by thirty mts (Dash) in seconds, leg Explosive power was tested by standing broad jump in meters, flexibility was tested by sit and reach in centimetres. Pre and post-test random group design was used for this study. The dependent 't' test was applied to determine the difference between the means of two group. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05 level of confidence was fixed. The result of the study shows that, there was a significant improvement takes place on speed, explosive power, flexibility of adolescent male tennis players due to the effect of twelve weeks of resistance training. And also concluded that, there was a significant difference exists between experimental and control groups on speed, leg explosive power, flexibility. The control group did not improve the selected criterion variables.

**Keywords:** Resistance training, speed, leg explosive power, flexibility

### Introduction

Tennis is one of the popular sports. Tennis is sport characterized by variety demands on the human body all depending on the level of play. Tennis requires coordination, agility, speed, flexibility, strength and power. Each aspect becomes more important at higher levels of play. Like some team sports, speed, explosive power and flexibility are more associated with the successful performance of the tennis. In this condition, the physical variables are plays a major role in becoming a solid and strong tennis player when the match duration going beyond the one hour. Speed is associated with the rate of time to hit the ball effectively and power is related to energy production and flexibility is considered with multi directional movements. So that these variables are essential to sustain the match period and also these are important factors to decide the success. To achieve maximum achievement, a tennis player must follow intensive and continuous training in terms of physical variables to achieve victory.

Resistance training aimed at development of motor abilities and the control of body movement through development of neuromuscular system to perform effectively. This training aims to improve ability of player to perform explosive multi-directional movements by reprogramming the neuromuscular system to work effectively. Thus, the researcher interested to investigate the effect of resistance training on physical variables of tennis players.

### Resistance training

Resistance training is a modality of exercise that has grown in popularity over the past two decades, particularly for its role in improving athletic performance by increasing muscular strength, power and speed, hypertrophy, local muscular endurance, motor performance, balance, and coordination. It is a careful progression system with goal targeting, exercise testing, proper exercise technique, supervision, and optimal exercise prescription which all

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contribute to the successful implementation of a resistance training program. Included within a program for resistance training is the use of both concentric and eccentric muscle actions and the performance of both single and multiple joint exercises, plus unilateral and bilateral movements as well. It is the magnitude of the individual effort and systematic structuring of the training stimulus that ultimately determines the outcomes associated with resistance training. Thus, resistance-training programs need to be individualized (e.g., based on individual goals) in order to maximize the outcomes (Kraemer & Ratamess, 2000) [1].

### Methods

The purpose of the study was to find out the effect of resistance training. To achieve the purpose of the study, thirty adolescent male tennis players were selected from National Sports School, ajjanoor, Coimbatore. The subjects were randomly assigned into two equal groups namely, resistance training group (PTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks (alternate days) for the training period of twelve weeks. The control group was not given any sort of training except their routine.

### Design

**Table 1:** Computation of 't' ratio on experimental group and control group selected physical variables of adolescent male tennis players

Group	Variables		Mean	N	Std. deviation	Std. error mean	t ratio
Experimental group	Speed	Pre	4.38	15	0.28	0.025	*2.16
		Post	4.33	15	0.24		
	Leg explosive power	Pre	1.50	15	0.10	0.24	*3.09
		Post	1.58	15	0.12		
	Flexibility	Pre	23.46	15	2.58	0.52	*3.71
		Post	25.40	15	2.89		
Control group	Speed	Pre	4.38	15	0.34	0.02	1.74
		Post	4.39	15	0.35		
	Leg explosive power	Pre	1.51	15	0.10	0.006	0.80
		Post	1.50	15	0.09		
	Flexibility	Pre	23.06	15	3.08	0.63	0.10
		Post	23.13	15	3.41		

\*Significant level 0.05 level degree of freedom (2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and 't' ratio on selected physical fitness parameters namely speed, leg explosive power and flexibility of experimental group. The obtained 't' ratio on speed, leg explosive power and flexibility were 2.16, 3.04 and 3.71 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were greater than the table value it was found to be statistically significant. Further the computation of mean,

To evaluate physical variables, Speed was tested by thirty mts (Dash) in seconds, leg explosive power was tested by standing broad jump in meters and flexibility was tested by sits and reaches in centimetres. The parameters were measured at baseline and after twelve weeks of resistance training were examined.

### Training programme

The training programme was conducted for 45 minutes for session in a day, 3 days in a week for a period of twelve weeks duration. These 45 minutes included 10 minutes warm up, Resistance training for 25 minutes and 10 minutes warm down. Every three weeks of training 5% of intensity of load was increased from 65% to 80% of work load. The volume of resistance training prescribed based on the number of sets and repetitions. The equivalent in resistance training is the length of the time each action in total 3 day per weeks (Monday, Wednesday and Friday).

### Statistical analysis

The collected data before and after training period of twelve weeks on the above said variables due to the effect of resistance training was statistically analysed with 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. ( $P < 0.05$ )

standard deviation and 't' ratio on selected physical parameters namely speed, leg explosive power and flexibility of control group. The obtained 't' ratio on speed, explosive power and flexibility were 1.74, 0.80 and 0.10 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the obtained 't' values were lesser than the table value it was found to be statistically not significant.

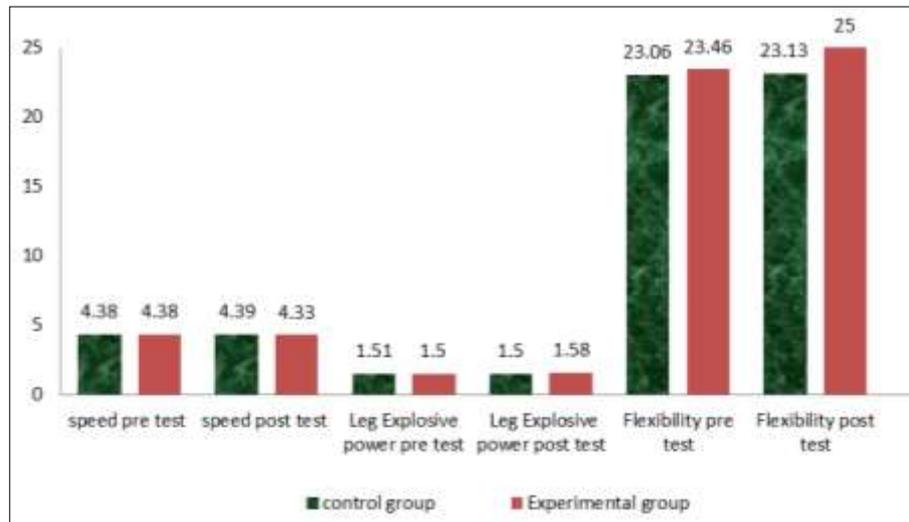


Fig 1: Shows control and Experimental group

### Discussion and Findings

The present study experiment the effect of resistance training on physical variables of adolescent male tennis players. The result of the study indicated that the resistance training improved the physical variables such as speed, leg explosive power and flexibility. The findings of the present study had similarity with the findings of the investigations referred in this study. P. Velusamy-2013 [2] reported that the significant difference found on speed, flexibility, muscular power due to the resistance training with the circuit training among intercollegiate volley ball players. Pre-season resistance training had greater influence on speed and power of the female university softball players Nurlman Bin Md Rahim 2015 [3]. According to the R. Savarirajan 2013 [4], high velocity resistance training is found to be better training to increase speed through the improvement of the speed. Resistance training has significant effect on the speed, flexibility of university level male badminton players after six week training period Kishor P Pathak 2016 [5]. The speed, flexibility variables were increased by the influence of the Resistance training in youth tennis players Tom E Mabon 2016 [6]. One of the important fitness variable explosive powers also increased and had improvement by the resistance training after six week training program in female taekwondo players Hoda Zearei 2013 [7]. Thus, from the result of the present study, it is speculated that the observed changes in speed, leg explosive power and flexibility may properly designed resistance training which are suitable for adolescent male tennis players.

### Conclusion

The results concluded that there was a significant improvement takes place on selected physical variables due to the effect of twelve weeks resistance training. There was a significant difference exists between experimental and control groups on selected physical variables such as speed, leg explosive power and flexibility.

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