



P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (RJIIF): 5.38  
IJPESH 2023; 10(5): 232-235  
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[www.kheljournal.com](http://www.kheljournal.com)  
Received: 27-07-2023  
Accepted: 03-09-2023

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## Effect of ladder training on selected skill related physical fitness variables of tennis players

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### Abstract

The impartial of this study was to travel the ladder training on selected skill related physical fitness variables of tennis players, totally 30 inter collegiate players to participate in S.S.D.M. College, Kovilpatti, Tamil Nadu this study. Treatment group I underwent ladder training, group II acted as control group. All thirty subjects were inducted for pre and posttest on agility and reaction time. The ladder training was given to the experimental group for 5 days per week (Monday to Friday) for the period of eight weeks. The control group was not given any sort of training except their routine work. The agility (4 x 10 meter shuttle run in seconds) and reaction time (penny cup test) were assessed before and after training period. The result from 't' test and inferred that 12 weeks ladder training treatment produced identical changes over agility and reaction time of tennis players. Further, the findings confirmed the ladder training is suitable protocol to bring out the desirable changes over agility and reaction time of tennis players.

**Keywords:** Ladder training, agility, reaction time and tennis players

### Introduction

Tennis is a sport based on unpredictability. The unpredictability of point length, shot selection, strategy, match duration, weather, and the opponent all influence the complex physiological aspects of tennis play. Designing and implementing training for tennis requires a solid understanding of the many physiological variables critical to optimal performance. Tennis requires short explosive bursts of energy repeated dozens, if not hundreds, of times per match or practice session. Tennis, unlike many other sports, does not have time limits on matches. This can result in matches lasting less than one hour or as long as five hours (In five-set matches). This variability requires successful tennis athletes to be highly trained both an aerobically for performance, and aerobically, to aid in recovery during and after play. Although tennis is one of the most popular sports worldwide, few extensive reviews have been completed to help provide tennis scientists, coaches, and players with a summary of the tennis research. This information may aid in the creation of training programmes designed to improve performance and reduce injury risk. The information for this evidence based review was obtained using searches on the Medline and Sport discus databases with the pertinent tennis articles cross checked for sources and appropriate references examined for relevant information. Tennis is the world's second most popular sport, trailing only soccer. It is played in 195 countries and has an estimated 87 million fans (who have played tennis at least once) and represents 1.17% of the world's population. Tennis has evolved from a predominantly technical sport in which sport-specific technical skills (e.g., stroke skills) predominated to a more explosive sport characterized by increasing serve and stroke velocity and requiring significantly increased physical demands. Physical fitness levels of the tennis players are critical in determining who wins and who loses, especially those with extremely close competitive levels. Tennis players must possess a combination of agility, speed, strength, aerobic capacity, and other physical fitness components in order to execute advanced shots and compete well against increasingly competent opponents. This extraordinary performance cannot be boiled down to a single distinguishing physical attribute. Tennis demands a delicate interplay of several components of physical fitness. Tennis skill development and performance are the procedures that underpin these components of physical fitness.

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A healthy physical structure is critical for an athlete's performance to improve. Additionally, the International Tennis Federation recommended that tennis players undergo a physical fitness examination.

**Materials and Methods**

To attain the determination of the study 30 tennis players at the age group of 21-25 years were selected from S.S.D.M. College, Kovilpatti, Tamil Nadu. The selected subject was randomly assigned into two equal groups, consist of fifteen each, namely laddet training group (n=15) and Control group (n=15). The respective training was given to the experimental group the 5 days per weeks (Monday to Friday) for the training period of twelve weeks. The control group was not given any sort of training except their routine. The evaluated agility were measured by 4 x 10 meter shuttle run in seconds and reaction time were measured by penny cup test the unit of measurement was in seconds and. The parameters were

measured at baseline and after 12 weeks of ladder training were examined. The intensity was increased once in two weeks based on the variation of the exercises. The training programme was lasted for 45 minutes for session in a day, 6 days in a week for a period of 12 weeks duration. These 45 minutes included warm up for 10 minutes, 25 minutes ladder training and warm down for 10 minutes. The equivalent in shadow training with Suryanamaskar practices is the length of the time each action in total 5 day per weeks. (Monday to Friday)

**Statistical analysis**

The collected data on agility and reaction time due to the combination of ladder training was statically analyzed with “t” test to find out the significant improvement between pre& posttest if any. In all case the criterion for spastically significance was set at 0.05 level of confidence ( $p < 0.05$ ).

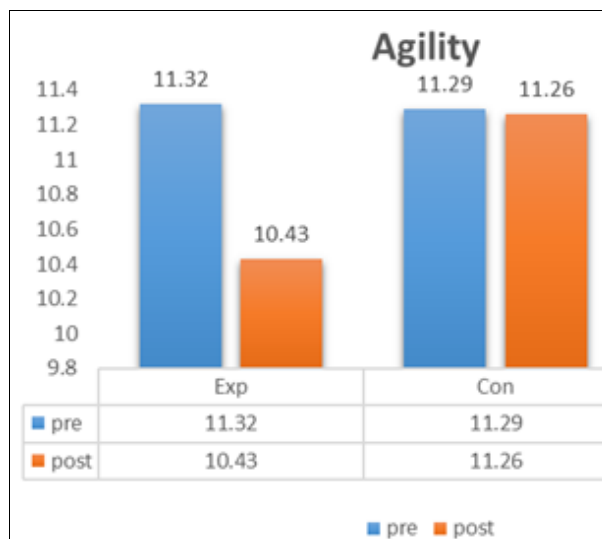
**Table 1:** Computation of ‘t’ ratio on agility of tennis players on experimental group and control group (Scores in Numbers/ Seconds)

Group	Test	Mean	Std. Deviation	T ratio
Agility	Experimental Group	Pre test	11.32	1.08
		Post test	10.43	1.25
	Control Group	Pre test	11.29	0.99
		Post test	11.26	0.78
				14.64*
				0.82

\*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 agility of experimental and control group. The obtained ‘t’ ratio on agility were 14.64 and 0.82 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

experimental group ‘t’ values were greater than the table value of 2.14, it was found to be statistically significant. The control group ‘t’ value is less then table value of 2.14 it was found to be statistically insignificant.



**Fig 2:** Bar diagram showing the mean value on agility of tennis players on experimental group and control group

**Table 2:** Computation of ‘t’ ratio on reaction time of tennis players on experimental group and control group (Scores in Numbers/ Seconds)

Group	Test	Mean	Std. Deviation	T ratio
Reaction Time	Experimental Group	Pre test	5.03	0.75
		Post test	4.71	0.75
	Control Group	Pre test	5.09	1.17
		Post test	5.77	1.19
				8.30*
				1.52

\*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 reaction time of experimental and control group. The obtained ‘t’ ratio on reaction time were 8.30 and 1.52 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 experimental group ‘t’ values were greater than the table value of 2.14, it was found to be statistically significant. The control group ‘t’ value is less then table value of 2.14 it

was found to be statistically insignificant.



**Fig 2:** Bar diagram showing the mean value on agility of softball players on experimental group and control group

### Discussion on findings

The current study examined the effect of ladder training on the selected variables are agility and reaction time of the tennis players. The results of this study indicated that ladder training is more efficient to bring out needed changes over the agility and reaction time of the tennis players.

The 4x10 meter shuttle running test was applied to the subjects participating in the study and the maximum oxygen consumption capacity was determined by the values obtained from 4x10 meter shuttle running test. When the results related to maximum oxygen capacity were examined, mean values of male subjects were statistically higher than female subjects in terms of gender factor. In a study of 11-year-old girls and boys who did not exercise, the mean values of Max VO<sub>2</sub> were 27.76 ml / kg / min and 32.11 ml / kg / min, respectively (Saygın, Karacabey, 2011) <sup>[13]</sup>. In another study conducted at 7-11 years of age, aerobic capacities of 766 male students were reported as 46, 4 ml / kg / min (Esmailzadeh, Kalantari, and Nakhostin-Roohi, 2013) <sup>[14]</sup>.

The reaction time performances of the subjects participating in the study were determined by the penny cup test. In a study conducted on young male tennis players. It was reported that the mean value of penny cup average was 5.07 sec in the study performed on male children in the same age range (Ayan, Erol, Mülazımoğlu, and Gültekin, 2008) <sup>[15]</sup>. It can be said that these results are similar to the mean values of penny cup in the study. According to pre-test results, when the CG subjects got better scores than the subjects who made up the SB group, but the intermediate test and the post-test were examined, it was seen that the subjects who formed the group of the resultant training program got better scores than the CG at penny cup. This can be a sign that ladder training has a positive effect on acceleration.

The result from this study are very hopeful and it proves the benefits of ladder training. The tennis players are not only using dance exercises to improve their flexibility but also to improve the presentation. Also, the results support that development in mobility can occur 12 weeks of ladder training.

### Conclusions

Based on the result of the study it was concluded that the ladder training have been significantly changes in reaction time of tennis players. It was concluded that the ladder training have been significantly changes in agility of tennis players.

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