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A study on effect of plyometric training for development of cardio-vascular endurance in tennis players

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Abstract

The study was designed to find out the effect of plyometric training for development of cardio-vascular endurance in tennis players. For this research study non probability sampling methods purpose sampling method has been adopted for selecting samples. Through this purposive sampling methods researcher have selected 40 district level tennis players. The players are daily practiced at MVP Samaj's KBT Lawn tennis Club in Nasik. The subject are divided in two group i.e. control group (N=20) and experimental group (N=20) between the age group of 18 to 25 years. Plyometric exercises such as standing mountain climbers, power skipping, squat thrust, jump squats, standing long jump, side to side ankle hop, double leg trunk jump, double leg hops, incline push up depth jump, split pike jump, standing long jump with sprint, stadium hops, etc. were given three times a week for eight weeks for experimental group and controlled group were given regular general tennis training in eight week. To assess the Cardio-vascular Endurance was measure on 12 m run and walk test. This study shows that due to the plyometric exercises there is a significant improvement of experimental group in the cardio-vascular endurance of district level tennis men players.

Keywords: Plyometric training, cardio-vascular endurance, district level tennis players

Introduction

Every human being participates in some kind of sports activity or physical exercise during the course of his life. This exercise may assume different forms for different individuals. It may be walking, jogging, cycling, swimming, working in a factory, participation in games and sports etc. Regular participation in exercise programmer clearly influences physical, physiological and mental fitness of an individual.

Tennis is a sport played among two players or two pairs of players competing with each other in a rectangular tennis court with fixed boundaries. The two sides of the court are separated with a net. The sport involves shooting a tennis ball towards the other side of the court with a tennis racket. The ball has to fall within the court boundaries. Players gain a point when the opposite team or player fails to deliver the ball to the opponent. Tennis as a sport was played outdoors for long time since its origin. The complete playing area was called lawn and the sport was fondly called as Lawn-Tennis. The court surface was either made of clay or grass. Gradually, the playing conditions and surface changed and the sport was played indoors too to avoid any sort of climatic interruptions. As new tournaments emerged by late 20th century, the court surfaces also varied. For example, Wimbledon is a tournament played on grass court. French Open is played on clay court. US Open and Australian Open are played on hard surfaces. Paris Masters is another tournament that is played on carpet surface which is a removable court.

The actual term plyometric was first coined in 1975 by Fred Wilt; one of America's more forward thinking track and field coaches. Based on Latin origins, plyo + metrics is interpreted to mean "measurable increases." These seemingly exotic exercises were thought to be responsible for the rapid competitiveness and growing superiority of eastern Europeans in track and field events.

Plyometric, or "plyos" for short, is a type of exercise designed to produce fast and powerful movements.

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They are generally used by athletes to improve performance in sports, especially those that involve speed, quickness and power. In addition, it is possible to find plyometric used in the fitness field, but to a much lesser degree. Thus, plyometric exercises use explosive, fast acting movements to develop muscular power and to improve overall speed. In other words, it's exercise that allows muscles to exert maximum force in the shortest amount of time possible.

Plyometric training can be used to develop fast muscle fiber so that you can get power, particularly in the legs. It's based on the idea that a shortening muscular contraction is much stronger if it immediately follows a lengthening contraction of the same muscle. Muscle fibers transfer energy more quickly and powerfully when they move in this way. It's like stretching fully a coiled spring and then letting it go; energy is released rapidly as the spring recoils. Individuals can use activities such as hopping depth jumping and bounding. Plyometric training should be implemented under supervision, since the technique and strength necessary to do the activities is broken by periods of rest to minimize injury.

Methods and Procedures

The sample for the present study consists of forty district levels tennis male players from MVP Samaj's K.B.T. Lawn Tennis Club in Nasik city were randomly selected as the subject of the study and age group of 18 to 25 years. Cardio-vascular endurance were selected as a dependent variable and plyometric exercise were considered as independent variables. Plyometric exercises such as standing mountain climbers, ski jumper, squat thrust, jump squats, standing long jump, side to side ankle hop, double leg trunk jump, double leg hops,

incline push up depth jump, split pike jump, standing long jump with sprint, stadium hops etc. were given three times a week for eight weeks (45 min/day) for experimental group and controlled group were given regular general tennis training. A pilot study was conducted before the investigation. The pre and post tests for both groups were collected from standardized test of 12 m run and walk test for data was analyzed to find the t-ratio for significance result. Standard statistical packages were used to analyses the data.

Table 1: Shows the variable test and measuring unit

Sr. No.	Variable	Test	Measuring Unit
1.	Cardio-vascular Endurance	12m run/walk test	Meters

Statistical Analyses

Student's t-test for independent data was used to assess the between-group differences. The level of $p \leq 0.05$ was considered significant.

Result and Discussion

The study shows that due to the plyometric training there is improvement of experimental group in the Cardio-vascular Endurance and controlled group has low improvement in Cardio-vascular Endurance due to the regular training. It is recommended that the plyometric exercises are admirable to improve the Cardio-vascular Endurance of district level tennis men players. The finding pertaining to the data are presented in the table 2 & 3.

Table 2: Mean, standard deviation, mean difference and t-ratio of Cardio-vascular Endurance for district level tennis men players (Control group and Experimental groups)

Group	N	Pre-test		Post-test		M.D.	T-Value	P-value
		Mean	SD	Mean	SD			
Control	20	2080	167	2097	120	17	0.89	0.19
Experimental	20	2167	229	2587	206	420	12.11	1.11

* Significant at 0.05 level of confidence

The table 2 shows that the district level tennis players of pre and posttest mean scores of cardio-vascular endurance for control group are 2080 and 2097 respectively with standard deviations (SD) 167 and 120. For experimental group the pre and posttest mean scores are 2167 and 2587 respectively with SDs 229 and 206 respectively. The calculated t value between pre and post test scores of experimental group are 12.11 with df 19 ($p \leq 0.05$), there is a statistical significance difference between pre and post scores of experimental group due to the control group. The obtained t value between pre and post test scores of control group are 0.89 with df 19 ($p \geq 0.05$), there is

no statistical significance difference between pre and post scores of control group. The result shows that the plyometric training significantly improves the performance of cardio-vascular endurance for district level tennis players experimental group.

The following graphical representation Figure 1 explained the mean, standard deviation, mean difference and t-ratio of both experimental group and control group on cardio-vascular endurance with respect to pre-test and post-test plyometric training on district level tennis players.

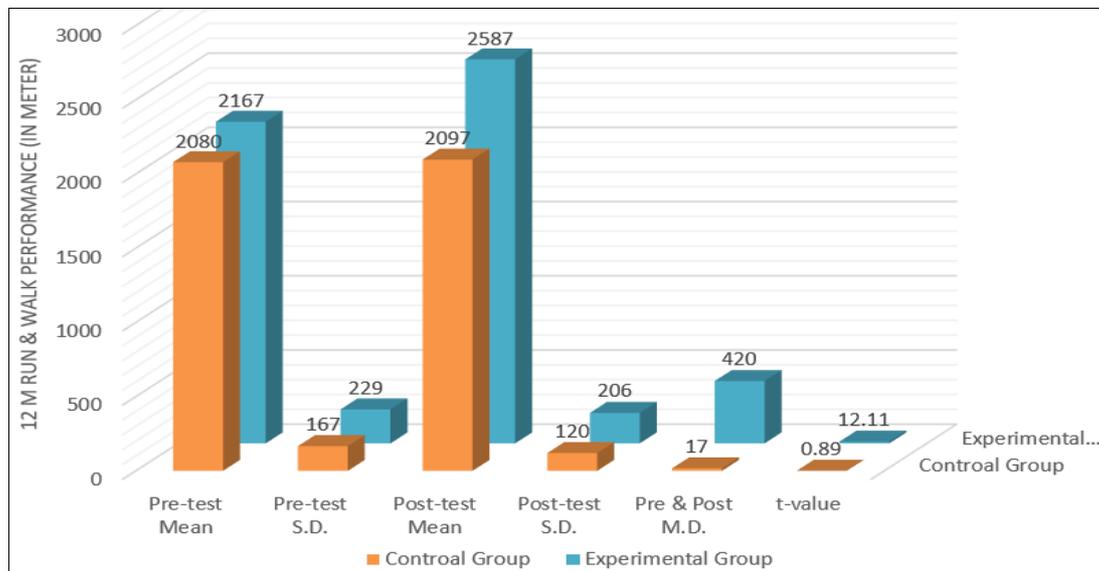


Fig 1: Bar diagram showing the mean, standard deviation, mean difference and t-ratio of cardio-vascular endurance for district level tennis players. (Control group and Experimental groups)

Conclusions

1. It was concluded that there was significant improvement in cardio-vascular endurance due to plyometric training on district level tennis men players.
2. The result of the study reveals that plyometric training would improve cardio-vascular endurance significantly on district level tennis men players.

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