

Isolated and Combined Effect of Plyometric and Resistance Training on Speed Performance of Male Cricket Players

K. Rajasekar,

Ph.D Scholar (Part Time), Department of Physical Education and Health Sciences,
Alagappa University, Karaikudi, Tamilnadu, India -630 00

Dr. M. Kalaiselvi,

Assistant Professor, Department of Physical Education and Health Sciences,
Alagappa University, Karaikudi, Tamilnadu, India -630 00

ABSTRACT

The purpose of the study was to determine the effects of both individual and combined plyometric and resistance training on the speed performance of male cricket players. Sixty (N=60) male cricket players who were enrolled at different colleges in the Pudukkottai District of Tamil Nadu, India, were chosen at random as the study's subjects. Plyometric training, resistance training, combined resistance and plyometric training, and control group were the four groups of fifteen individuals each that were randomly selected among the subjects (n=15). The subjects were between the ages of 18 and 21. Group-I underwent Plyometric Training, group-II underwent resistance training, Group III underwent combined resistance and plyometric training, and Group IV served as the control group in the experiment. The experimental groups had corresponding training for twelve weeks, three days a week. Speed was chosen as the dependent variable and was measured by 50 meters run. Speed tests were conducted on each individual both before and after the trial period. Analysis of covariance was used to statistically assess the data collected from the experimental groups prior to and following the experimental period (ANCOVA). The Scheffe's Post hoc test was used to ascertain the paired mean differences whenever the 'F' ratio for adjusted post test means was found to be significant. For each scenario, the degree of confidence was set at 0.05. Plyometric training, resistance training, and combined plyometric and resistance training were the experimental groups that significantly improved in the chosen variable, anaerobic power. Plyometric training, resistance training, and combined plyometric and resistance training all had a significant impact on anaerobic power. Additionally, the study's findings showed that the combined plyometric and resistance training group performed the best of the three training groups in terms of enhancing anaerobic power.

Keywords: Plyometric Training, Resistance Training and Combined Plyometric and Resistance Training, Anaerobic Power

INTRODUCTION

Today, resistance training in some form or another is used as conditioning workouts in every competitive sport played across the globe. Plyometric training has been shown to be a highly effective way to increase explosive strength and is a great way to enhance body power (Chaudhary and Jhajharia 2010).

In plyometric training (PT), the same muscles and connective tissues are dynamically and quickly stretched (using an eccentric action), then quickly contracted (using a concentric action). This training focuses on mastering the quick or "explosive" transition from a muscle extension to a contraction, as in specialised repeated jumping. Exercises combine strength and speed for high-intensity, explosive muscle contractions that improve power (Hakkinen et al., 1985).

A rapid, resisted, eccentric contraction during which the muscle lengthens is followed immediately by a rapid movement reversal with a resisted concentric contraction of the same muscle. This is known as plyometric training. There is widespread consensus that plyometric exercise enhances sports-specific abilities like vertical jump, muscle power production, and agility. (Utku Alemdaroglu, 2012).

Resistance training, often known as strength training, involves using tools like dumbbells, barbells, and other equipment to enhance one's physical attractiveness, athletic performance, and/or health. Resistance training is used by athletes in a variety of sports as part of their preparation. You can reach training goals like increased muscle strength with the correct amount of exercise, which will also improve your body's structure and athletic performance. Resistance training should be a part of all exercise plans, whether they are geared toward strength and power sports or cardiovascular health. Resistance training must take precedence for athletes that compete in sports that need strength and power, such as weightlifting, bodybuilding, and sprinting. Many other athletes, especially those who participate in sports that require a high level of physical stamina, can benefit from strength training (Skelton et al., 1995).

METHODOLOGY

Sixty (N=60) male cricket players who were enrolled at different colleges in the Pudukkottai District of Tamil Nadu, India, were chosen at random as the study's subjects. Plyometric training, resistance training, combined resistance and plyometric training, and control group were the four groups of fifteen individuals each that were randomly selected among the subjects (n=15). The subjects were between the ages of 18 and 21. Group-I underwent Plyometric Training, group-II underwent resistance training, Group III underwent Combined resistance and plyometric training, and Group IV served as the control group in the experiment. The experimental groups had corresponding training for twelve weeks, three days a week. Speed was chosen as the dependent variable and was measured using the 50 meters run. Speed tests were conducted on each individual both before and after the trial period. Analysis of covariance was used to statistically assess the data collected from the experimental groups prior to and following the experimental period (ANCOVA). The Scheffe's Post hoc test was used to ascertain the paired mean differences whenever the 'F' ratio for adjusted post test means was found to be significant.

RESULTS & DISCUSSION

The results of the Analysis of Covariance on Speed of the pre, post, and adjusted test scores of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are presented in Table – 1.

Table – 1

The Summary of Mean and Dependent ‘t’ Test for the Pre and Post Tests on Speed of Experimental Groups and Control Group

Mean	Plyometric Training group	Resistance Training group	Combined Plyometric and Resistance Training group	Control group
Pre- test mean	7.71	7.66	7.75	7.63
Post-test mean	7.16	6.99	6.66	7.66
‘t’-test	12.19*	8.91*	14.09*	0.60

* Significant at 0.05 level.

(Table value required for significance at .05 level for ‘t’-test with df 14 is 2.15)

Table - 1 indicates that the pre-test mean of Speed for Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are 7.71, 7.66, 7.75 & 7.63 respectively.

The post-test mean are 7.16, 6.99, 6.66 & 7.66 respectively. The obtained dependent t-ratio values between the pre and post test means on Speed of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are 12.19, 8.91, 14.09 & 0.60 respectively.

The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that Experimental groups such as Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group had registered significant improvement in Speed.

The results of the Analysis of Covariance on Speed of the pre, post, and adjusted test scores of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are presented in Table – 2.

Table – 2

**Analysis of Covariance on Speed of Experimental Groups
and Control Group**

Test	Plyometric Training group	Resistance Training group	Combined Plyometric and Resistance Training group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre Test Mean	7.71	7.66	7.75	7.63	Between	0.13	3	0.04	1.38
					Within	1.72	56	0.03	
Post Test Mean	7.16	6.99	6.66	7.68	Between	8.04	3	2.68	60.92*
					Within	2.47	56	0.04	
Adjusted Post Test Mean	7.14	7.02	6.62	7.71	Between	8.81	3	2.94	99.87*
					Within	1.62	55	0.03	

* Significant at 0.05 level of confidence

(Speed Scores in 1/100th of a Second)

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

The above table-2 indicates that the pre-test mean values on Speed of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are 7.71, 7.66, 7.75 and 7.63 respectively. The obtained 'F' ratio of 1.38 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The post test mean values on Speed of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are 7.16, 6.99, 6.66 and 7.68 respectively. The obtained 'F' ratio of 60.92 for post-test scores was higher than the table value of 2.76 for degrees of freedom 3 and 56 required for significance at 0.05 level of confidence on Speed.

The adjusted post-test means on Speed of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group are 7.14, 7.02, 6.62 and 7.71 respectively. The obtained 'F' ratio of 99.87 for adjusted post-test scores was higher than the table value of 2.78 for degrees of freedom 3 and 55 required for significance at 0.05 level of confidence on Speed.

The results of the study indicate that there are significant differences among the adjusted post test means of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group in Speed.

To determine which of the paired means have a significant difference, the Scheffe's test is applied as Post hoc test and the results are presented in Table – 3.

Table – 3

The Scheffe's test for the differences between the adjusted post test paired means on Speed

Adjusted Post-test Means				Mean Difference	Confidence Interval
Plyometric Training group	Resistance Training group	Combined Plyometric and Resistance Training group	Control Group		
7.14	7.02			0.13	0.18
7.14		6.62		0.53*	0.18
7.14			7.71	0.57*	0.18
	7.02	6.62		0.40*	0.18
	7.02		7.71	0.70*	0.18
		6.62	7.71	1.10*	0.18

* Significant at 0.05 level of confidence

Table-3 shows that the adjusted post test mean differences on Speed between Plyometric Training group and Combined Plyometric and Resistance Training group, Plyometric Training group and Control group, Resistance Training group and Combined Plyometric and Resistance Training group, Resistance Training group and Control group & Combined Plyometric and Resistance Training group and Control group are 0.53, 0.57, 0.40, 0.70 and 1.10 respectively, which are greater than the confidence interval value of 0.18 at 0.05 level of confidence.

Further the table-4.3 shows that the adjusted post test mean differences on Speed between Plyometric Training group and Resistance Training group is 0.13, which is lesser than the confidence interval value of 0.18 at 0.05 level of confidence.

The results of the study showed that there was a significant difference between Plyometric Training group and Combined Plyometric and Resistance Training group, Plyometric Training group and Control group, Resistance Training group and Combined Plyometric and Resistance Training group, Resistance Training group and Control group & Combined Plyometric and Resistance Training group and Control group on Speed.

Further the results of the study showed that there was no significant difference between Plyometric Training group and Resistance Training group on Speed.

The above data also reveal that Combined Plyometric and Resistance Training group had shown better performance than Plyometric Training group, Resistance Training group and Control group in Speed.

The Pre, Post and Adjusted post test mean values of Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group on Speed are graphically represented in the Figure -1.

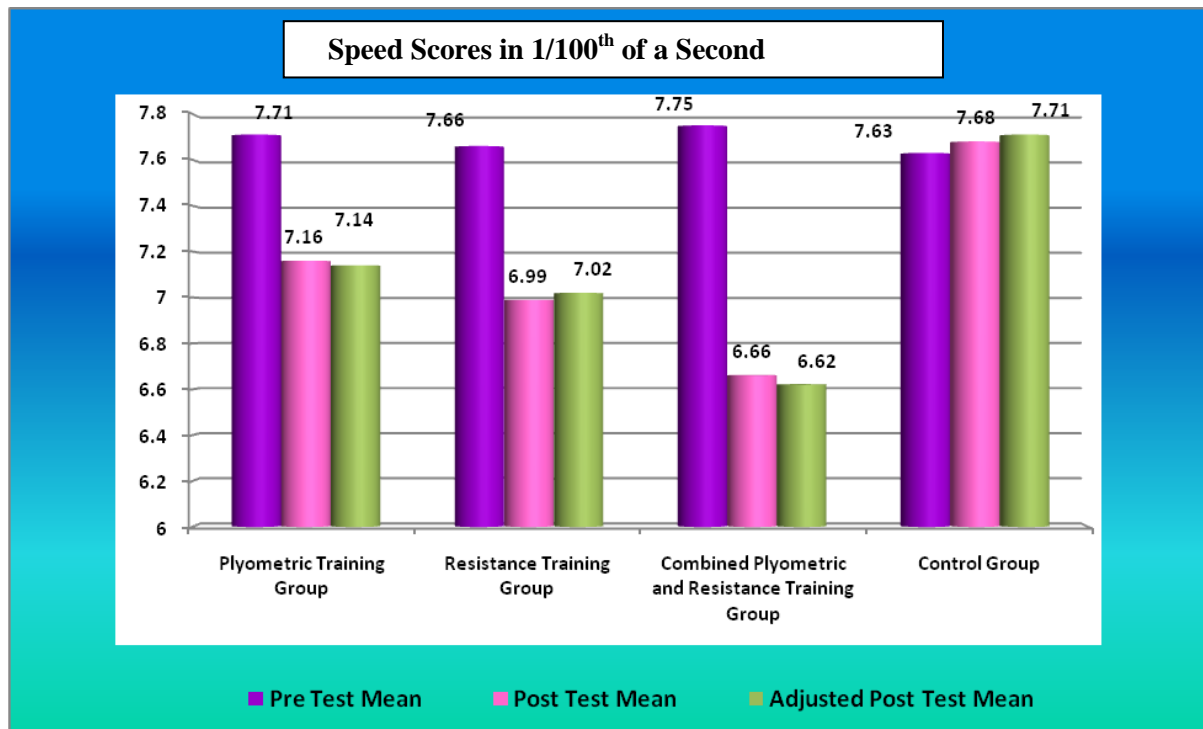


Figure: 1 The Pre, Post and Adjusted Post test Mean values Plyometric Training group, Resistance Training group, Combined Plyometric and Resistance Training group and Control group on Speed

CONCLUSION

The selected variable Speed has significantly improved in the experimental groups, Plyometric Training, Resistance Training, and Combined Plyometric and Resistance Training. In terms of Speed, there were also notable variations between plyometric training, resistance training, and combined plyometric and resistance training. The combined plyometric and resistance training group was shown to be the most effective of the three training groups in increasing Speed compared to other groups, according to the study's findings.

REFERENCES

- Chaudhary C, Jhajharia B (2010), Effects of plyometric exercises on selected motor abilities of university level female basketball players, *British Journal of Sports Medicine*, 44:i23.
- Hakkinen K, Alén M and Komi PV (1985), Changes in isometric force-and relaxation-time, electromyographic and muscle fibre characteristics of human skeletal muscle during strength training and detraining. *Acta Physiol Scand*. 125:573–585.
- Skelton DA, Young A, Greig CA, Malbut KE(1995), Effects of resistance training on strength, power, and selected functional abilities of women aged 75 and older, *Journal of the American Geriatrics Society*. Oct;43(10):1081-7.
- Utku Alemdaroglu(2012), The Relationship Between Muscle Strength, Anaerobic Performance, Agility, Sprint Ability and Vertical Jump Performance in Professional Basketball Players *Journal of Human Kinetics* 31, 99 – 106.