

## EFFECT OF RESISTANCE TRAINING AND PLYOMETRIC TRAINING IN SERIES AND PARALLEL ON SPEED AND AGILITY AMONG WOMEN STUDENTS



## PHYSICAL EDUCATION

**Keywords :** Speed and Agility

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### ABSTRACT

Aim of the Study find out the assess Effect of Resistance training and Plyometric training in series and parallel on speed and agility among women students. The study was formulated as a true random group design, consisting of a pre test and post test. The subjects (n=45) were randomly assigned to three equal groups of fifteen The selected subjects were divided into three equal groups and each group consisted of fifteen subjects. Group I underwent series training of resistance and plyometric training [resistance training for first six weeks and plyometric training for remaining six weeks], Group II underwent parallel training of resistance and plyometric training [resistance and plyometric training s in alternate days and alternate weeks]. Group III acted as control who did not participate in any special training apart from their regular physical education programme in the curriculum. experimental period and after the experimental period of twelve weeks to determine the training effects. The subjects were re-tested after three weeks of cessation of training to found the detraining effects. To identify the significant difference among the groups due to training and detraining mean gain method was followed.

### I. INTRODUCTION

Swami Vivekananda has stressed that “What India need today is not the Bhagwat Geeta but the football ground. Physical fitness is to the human body what fine-tuning is to an engine. It enables us to perform up to our potential. Fitness can be described as a condition that help us for better look, pleasant feeling and of our best. Physical fitness is “the ability to perform daily task vigorously and alertly, with energy left over for enjoying leisure-time activities and meeting emergency demands”. It is the ability to endure, to bear up, to withstand stress, to carry on in circumstance where an unfit person could not continue, and is a major basis for good health and well-being.

#### Statement of the problem

The present investigation is intended Effect of Resistance Training and Plyometric Training in series and parallel on speed and agility among women

#### Delimitations

- [1] The present study was delimited to forty five women students studying bachelor’s degree during the academic year 2014-17in Telangana Area
- [2] The age of the subjects was 17 to 23 years.
- [3] The variables tested were agility and Speed.

#### Limitations

The study was limited in the following factors.

- [1] Heredity, day to day activities, rest period, food habits, life style and family factors could not be controlled.
- [2] The general mood of the subjects while have affected the performance and was recognized as a limitation.
- [3] All efforts made by the research scholar to motivate the students to put up their optimal performaces in various test

items. But there were no objective measures available to make sure that each performed their optimum.

#### Methodology

In this chapter, the procedure and methods applied in the selection of subjects, selection of variable, selection of tests, instruments reliability, reliability of the data, competency of the tester, estimating 1 RM, pilot study, training programmers, orientation to the subjects collection of the data, tests administration, experimental design and statistical procedures has been explained.

#### Selection of Subjects

The purpose fo the study was to find out the effect of resistance training and plyometric training in series and parallel. On Speed and Agility. To achieve this purpose, forty five women students studying bachelor’s degree during the academic year 2014-17in Telangana area As per the records, their age ranged from 17 to 23 years. The selected subjects were divided into three equal groups and each group consisted of fifteen subjects. Group I underwent series training of resistance and plyometric training [resistance training for first six weeks and plyometric training for remaining six weeks], Group II underwent parallel training of resistance and plyometric training [resistance and plyometric training s in alternate days and alternate weeks]. Group III acted as control who did not participate in any special training apart from their regular physical education programme in the curriculum. Group I and Group II underwent their respective training programme for four days per week for twelve weeks. The subjects were free to withdraw their consent in case of felling of any discomfort during the period of their participation, but there were no drop outs in this study.

### Selection of Tests

The present study was undertaken to assess the effects of resistance training and plyometric training in series and parallel on speed, agility. The investigator analyzed various literatures and also consulted with physical education professionals to use most suitable tests to ensure the purpose of the study and represented in table -I

Table -I: The Selected Criterion variables and their Standardized Tests

Sl No.	Variables	Tests
1.	Speed	50 Mtrs Run
2.	Agility	Shuttle run

### Reliability of the Data

The reliability of the data was established by test-retest method. Ten subject were randomly selected and they were tested twice on selected criterion variables under similar conditions by the same testers. The collected data were analyzed by using intra class correlation to find out the reliability of the data separately for each criterion variable and are presented in table.II

Table-II: Intra Class Co-Efficient Of Correlation Values on Selected Criterion Variables

S.No.	Variable	"R" Value
1.	speed	0.83
2.	Agility	0.81

\*Significant at .01 level of confidence.

(The table value required for significant at .01 level of confidence is 0.767)

### Training Schedule Resistance and Plyometric Training- Series

Week	Warm up	Training	Repetition	Rest in between repetition	Cool down	Total time
Week 1	5 min	Resistance	3	45-60 sec	5 min	35
Week 2	5 min	Resistance	5	45-60 sec	5 min	40
		Resistance	7	45-60		

### Tests Administration

#### 50 Metres run

**Purpose :** to measure speed.

**Equipments :** A 50 metres course, two stop watches, starting clapper.

#### Procedure

After a short warm-up the subjects took position behind the starting line. Best results are obtained when two subjects run at the same time for competition. The starter used the command, on your mark and "GO", latter accompanied by a clap as a signal to the timer. The subjects run across the finish line.

#### Scoring

One trial is permitted, by using the stopwatch time was taken to the nearest one tenth of a second.

#### Shuttle Run

##### Purpose

The purpose of this test was to measure the agility of an individual to change the direction in the shortest period of

time.

### Equipments

Measuring tape, stop watches, [1/10<sup>th</sup> of a second] and wooden blocks.

### Procedure

The performer stood behind the starting line on the signal "go" runs to the blocks picks up one, returns to starting line and places block behind then she then repeated the process with the second block allow some rest between the two trials.

### Scoring

The score of each performance was the length of the time required to complete the course. The best trial was recorded to the nearest one tenth of a second.

Table - III: Analysis of Covariance for the Pre and Post Tests Data on Speed of Control, Series Training and Parallel Training Groups

Test	Control Group	Series Training Group	Parallel Training Group	Source of Variance	Sum of Squares	DF	Mean Squares	'F' Ratio
Pre Test								
Mean	9.65	9.67	9.75	Between	2.64	2	1.32	1.75
S.D	0.75	0.86	0.99	Within	31.69	42	0.75	
Post Test								
Mean	9.64	9.45	8.88	Between	4.71	2	2.35	3.36
S.D	0.70	.093	0.87	Within	29.27	42	0.70	
Adjusted Post Test				Between	11.06	2	5053	69.12
Mean	9.64	9.33	8.69	Within	3.25	41	0.08	

\* significant at .05 level of confidence

[The table value required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.23 respectively]

The table III shows that the pre test mean value of control, series training and parallel training groups on speed are 9.65, 9.67 and 9.75 respectively. The obtained "F" ratio of 1.75 for pre test scores is less than the required table value of 3.22 for significance with df 2 and 42 at .05 level of confidence. The post test mean values of control, series training and parallel training groups on speed are 9.64, 9.45 and 8.88 respectively. The obtained "F" ratio of 3.36 for post test scores is greater than the required table value of 3.22 for significance with df 2 and 42 at .05 level of confidence. The adjusted post test mean values of control, series training and parallel training groups on speed are 9.64, 9.33 and 8.69 respectively. The obtained "F" ratio of 69.12 for adjusted post tests scores is greater than the required table value of 3.23 for significance with df 2 and 41 at 0.5 level of confidence. The results of the study indicates that there is a significant difference, among control, series training and parallel training groups on speed. To determine which of the three paired means had a significant difference, the scheffe's test was applied as post hoc test and the results are presented in table IV.

Table-IV: The Scheffe's Test for Differences Between the Adjusted Post Test Paired Means on Speed

Adjusted post Test Means			Mean difference	Confidence interval
Control group	Series Training group	Parallel training group		
9.64	9.33	--	0.31*	0.26
9.64	--	8.69	0.95*	0.26
--	9.33	8.69	0.64*	0.26

\* significant at .05 level of confidence

Table IV shows that the means difference values on speed between control group and series training group, control group and parallel training group and series training group and parallel training group are 0.31, 0.95 and 0.64 respectively which are greater than the confidence interval value of 0.26. The results of the study shows the confidence interval value of 0.26. the results of the study shows that significant difference exist between control group and series training group, control group and parallel training group and series training group, parallel training group on speed. However, the improvement of speed was significantly higher for the parallel training group than the series training group. It may be concluded that parallel training is better than the series training in improving the speed.

**Agility**

The analysis of covariance for the pre and post tests data on agility of control group, series training group and parallel training group were analyzed and are present in Table V.

Table -V: Analysis of Covariance for the Pre and Post Tests Data on Agility of Control, Series Training and Parallel Training Groups

Test	Control Group	Series Training Group	Parallel Training Group	Source of Variance	Sum of Squares	DF	Mean Squares	'F' Ratio
<b>Pre Test</b>								
Mean	10.43	10.47	10.48	Between	2.25	2	1.13	1.49
S.D	0.65	0.46	0.48	Within	32.02	42	0.78	
<b>Post Test</b>								
Mean	10.42	1.015	9.79	Between	3.11	2	1.56	4.73
S.D	0.66	0.55	0.49	Within	13.65	42	0.33	
<b>Adjusted Post Test</b>								
Mean	10.58	10.11	9.58	Between	7.47	2	3.73	26.64
				Within	5.65	41	0.14	

\* significant at .05 level of confidence.

[ The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.22 and 3.22 respectively].

The table V shows that the pre test mean values of control, series training and parallel training groups on agility are 10.43, 10.41 and 10.48 respectively. The obtained "F" ratio of 1.49 for pre test scores is less than the required table value of 3.22 for significance with of 2 and 42 at .05 level of confidence. The post test man values of control, series training and parallel training groups in agility are 10.42 10.15

and 9.79 respectively. The obtained "F" ratio of 4.73 for post test scores is greater than the required table value of 3.22 for significance with dif 2 and 42 at .05 level of confidence. The adjusted post test mean values of control, series training and parallel training h groups on agility are 10.58, 10.11 and 9.58 respectively. The obtained "F" ratio of 26.64 for adjusted post tests score is greater than the required table value of 3.23 for significance with df 2 and 41 at .05 level of confidence. The results of the study indicates that there is a significant difference, among control, series training and parallel training groups on agility. To determine which of the three paired means had a significant difference, the scheffe's test was applied as post hoc test and the results are presented in Table 4.4

Table-VI: The Scheff's test for Differences Between the Adjusted post test Paired Means on Agility

Adjusted post Test Means			Mean difference	Confidence interval
Control group	Series Training group	Parallel training group		
10.58	10.11	--	0.47*	0.41
10.58	--	9.58	1.00*	0.41
--	10.11	9.58	0.53*	0.41

\* significant at .05 level of confidence

Table VI shows that the mean difference values on agility between control group and series training group, control group and parallel training group and series training group and parallel training group are 0.47, 1.00 and 0.53 respectively which are grater than the confidence internal value of 0.41. The results of the study shows that significant difference exist between control group and series training group, control group and parallel training group and series training group and parallel training group on agility. However, the improvement of agility was significantly higher for the parallel training group than the series training in improving the agility.

**CONCLUSIONS**

From the analysis of the data, the following conclusions were drawn.

1. There was a significant difference among control group, series training group and parallel training group on selected criterion variables namely speed, agility, in favour of parallel training group.
2. The series training and parallel training groups significantly improved speed, agility, when compared with control group.
3. Both parallel training and series training improved speed agility However, parallel training was found to be better than the series training.

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