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**EFFECT OF PLYOMETRIC TRAINING AND WEIGHT TRAINING ON  
SELECTED STRIDE LENGTH AND MUSCLAR ENDURANCE PARAMETERS OF  
BASKET BALL PLAYERS.**

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**ABSTRACT**

The purpose of the study was to find out effect of plyometric training, and weight training on selected speed and endurance parameters of basketball players. The research design of the study was random group design. 60 inter university level basketball players (N=60) who represented their university in different basketball tournaments were selected at random. The selected subjects were randomly divided into three groups and assigned into plyometric training group (Group-I), weight training group (Group-II) and control group. Each group consisted of 20 subjects. The training period was 12 weeks and three sessions a week on alternative days. Prior to experimental treatments all the subjects were measured of the criterion variables selected for this study. After the completion of the experimental period, the all the subjects were again measured of the criterion variables selected. The differences between the initial and final means on criterion variables were considered as the effect of respective treatment among the subjects. To test statistical significance of the difference, the obtained data were analysed using ANCOVA. In all cases 0.05 level was fixed to test the hypothesis.

**Introduction**

Sports are an enjoyable means of increasing physical fitness and relieving tension. It takes skills to be good; furthermore, it takes skill to have a good since. One tends to participate in those activities in which he possesses some skill and enjoys those activities in which his skill is better than average. Skill tests and learning are very closely related to neuro-muscular co-ordination. Fundamental skills are universal in nature and common to all races, where as their adaptation into games. The

fundamental skills are frequently measured in physical tests such as a dash, a throw for distance, a jump, and the like. Skill tests are usually conducted to test the ability of the students in the skill of sports and major games. Skill tests are necessary to find out, how far the students understood the material and subject matter, which have been taught in the class; as far as practical session is concerned in sports and physical education, the skills tests are necessary to enlighten the progress of students in their subject matter.

### **STATEMENT OF THE PROBLEM**

The purpose of the study was to find out effect of plyometric training, and weight training on selected speed and endurance parameters of basketball players.

### **DELIMITATIONS**

1. Sixty basketball men players who represented their university in inter university tournaments were selected at random.
2. Their age ranged between 18 and 25 years.
3. The selected 60 subjects were divided into plyometric, weight training and control groups, each group consisted of 20 subjects.
4. The speed parameters selected were stride length for the purpose of the study.
5. The endurance parameters selected were, muscular endurance
6. The training was given on alternative days of a week for a period of 12 weeks.

### **LIMITATIONS**

1. The diet of the subjects was not restricted with strict observation.
2. The socio-economic background of the subjects was not considered for the purpose of the study.
3. The heredity and the enrolment of the subjects were not considered in this study.
4. The psychological stresses and other factors, which affect the metabolic functions, were not taken into consideration.

5. The other extraneous factors which would have influenced the results of the study were not controlled.

## **METHODOLOGY**

### **SELECTION OF SUBJECTS**

To achieve the purpose of the study, 60 inter university level men basketball players who represented their university in different competitions were selected at random. The subjects were selected from Different University in Andhra Pradesh. The age of the subjects ranged between 18 and 25 years. The selected subjects were fit to undergo the experimental training and gave their written consent to participate in the study.

### **SELECTION OF VARIABLES**

Based on the available scientific literatures pertaining to plyometric training and weight training and in consultation with experts, the following dependent variables were selected for this study.

### **DEPENDENT VARIABLES**

#### **Speed Parameters**

- 1.Stride Length
- 2.Muscular Endurance

### **INDEPENDENT VARIABLES**

- 1.Plyometric training for 12 weeks
- 2.Weight training for 12 weeks

## **RESEARCH DESIGN**

The research design of the study was random group design. 60 inter university level basketball players (N=60) who represented their university in different basketball tournaments were selected at random. The selected subjects were randomly divided into three groups and assigned into plyometric training group (Group-I), weight training group (Group-II) and control group. Each group consisted of 20 subjects. The training period was 12 weeks and three sessions a week on alternative days. Prior to experimental treatments all the subjects were measured of the criterion variables selected for this study. After the completion of the experimental period, the all the subjects were again measured of the criterion variables selected. The differences between the initial and final means on criterion variables were considered as the effect of respective treatment among the subjects. To test statistical significance of the difference, the obtained data were analysed using ANCOVA. In all cases 0.05 level was fixed to test the hypothesis.

## **RESULTS AND DISCUSSIONS**

### **RESULTS ON STRIDE LENGTH**

The statistical analysis comparing the initial and final means of Stride length due to Plyometric Training and Weight Training among inter university basketball players is presented in Table I

Table I

## ANCOVA RESULTS ON EFFECT OF PLYOMETRIC TRAINING AND WEIGHT TRAINING COMPARED WITH CONTROLS ON STRIDE LENGTH

	PLYOMETRIC TRAINING	WEIGHT TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	Df	MEAN SQUARES	OBTAINED F
Pre Test Mean	1.61	1.60	1.60	Between	0.001	2	0.000	0.23
				Within	0.107	57	0.002	
Post Test Mean	1.64	1.62	1.60	Between	0.01	2	0.01	3.82*
				Within	0.11	57	0.002	
Adjusted Post Test Mean	1.63	1.62	1.60	Between	0.01	2	0.004	42.24*
				Within	0.01	56	0.000	
Mean Diff	0.03	0.02	0.001					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

\*Significant

As shown in Table I, the obtained pre test means on Stride length on Plyometric Training group was 1.61, Weight Training group was 1.60 was and control group was 1.60. The obtained pre test F value was 0.23 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Stride length on Plyometric Training group was 1.64, Weight Training group was 1.62 was and control group was 1.60. The obtained post test F value was 3.82 and the required table F value was 3.16, which proved that there was significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 42.24 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table

Table II

**Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on Stride length**

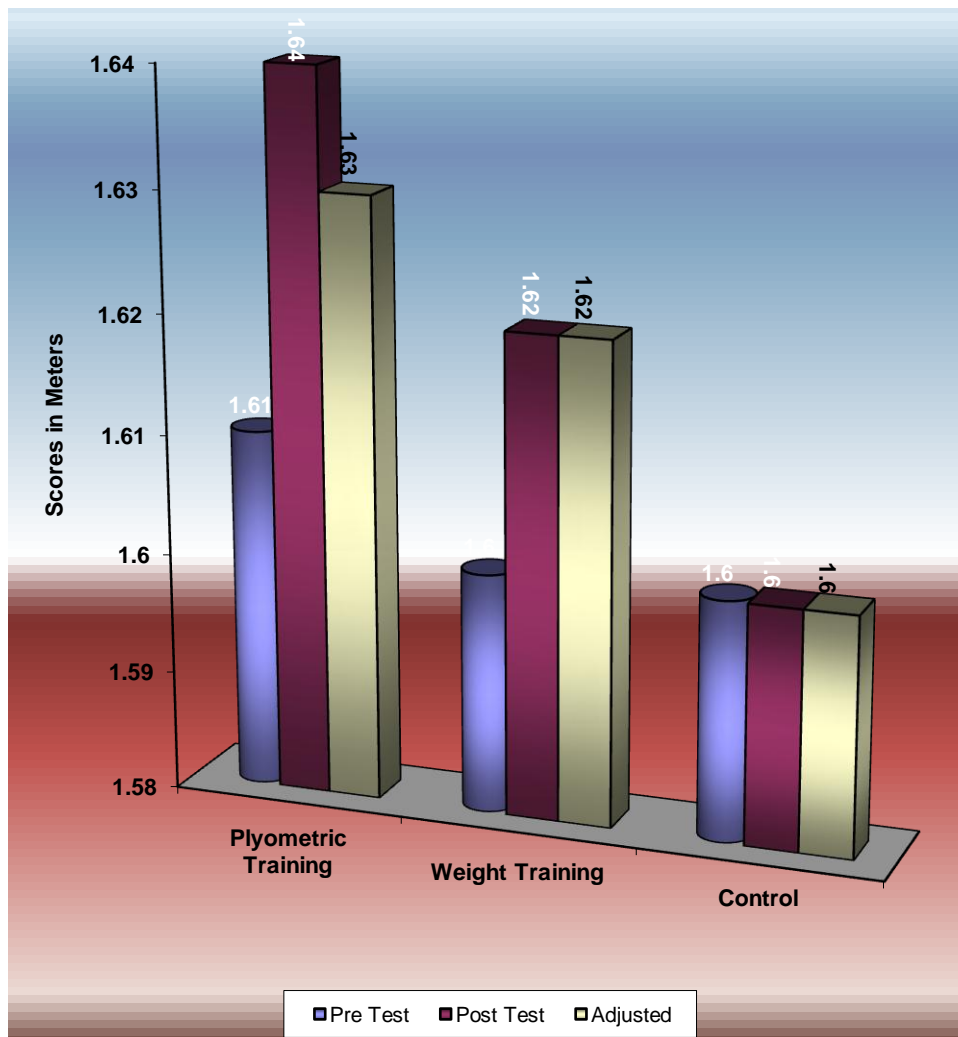
MEANS				Required C I
Plyometric Training Group	Weight Training Group	Control Group	Mean Difference	
1.63	1.62		0.01*	0.01
1.63		1.60	0.03*	0.01
	1.62	1.60	0.02*	0.01

\* Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Plyometric Training group and control group (MD: 0.03). There was significant difference between Weight Training group and control group (MD: 0.02). There was significant difference between treatment groups, namely, Plyometric Training group and Weight Training group. (MD: 0.01).

The means of pre test, post test and ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure

**Figure I**  
**BAR DIAGRAM SHOWING PRE TEST, POST TEST AND ORDERED ADJUSTED MEANS ON STRIDE LENGTH**



## DISCUSSIONS ON FINDINGS ON STRIDE LENGTH

In order to find out the effect of plyometric training and weight training on speed parameter Stride length the obtained pre and post test means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test.

The effect of Plyometric Training and Weight Training on Stride length is presented in Table. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 42.24 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table proved that there was significant difference between Plyometric Training group and control group (MD: 0.03) and Weight Training group and control group (MD: 0.02). Comparing between the treatment groups, it was found that there was significant difference between Plyometric Training and Weight Training group among inter university basketball players.

Thus, it was found that Plyometric Training was significantly better than Weight Training and control group in improving Stride length of the inter university basketball players.

**Table III**  
**ANCOVA RESULTS ON EFFECT OF PLYOMETRIC TRAINING AND WEIGHT TRAINING COMPARED WITH CONTROLS ON MUSCULAR ENDURANCE**

	PLYOMETRIC TRAINING	WEIGHT TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	35.40	34.15	36.35	Between	48.70	2	24.35	0.79
				Within	1759.90	57	30.88	
Post Test Mean	37.25	36.65	36.60	Between	5.23	2	2.62	0.11
				Within	1345.10	57	23.60	
Adjusted Post Test Mean	37.16	37.65	35.69	Between	40.51	2	20.25	44.24*
				Within	25.64	56	0.46	
Mean Diff	1.85	2.50	0.25					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

\*Significant

As shown in Table, the obtained pre test means on Muscular endurance on Plyometric Training group was 35.40, Weight Training group was 34.15 was and control group was 36.35. The obtained pre test F value was 0.79 and the required table F value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Muscular endurance on Plyometric Training group was 37.25, Weight Training group was 36.65 was and control group was 36.60. The obtained



post test F value was 0.11 and the required table F value was 3.16, which proved that there was no significant difference among post test scores of the subjects.

Taking into consideration of the pre test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 44.24 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table .

**Table IV**

**Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on Muscular endurance**

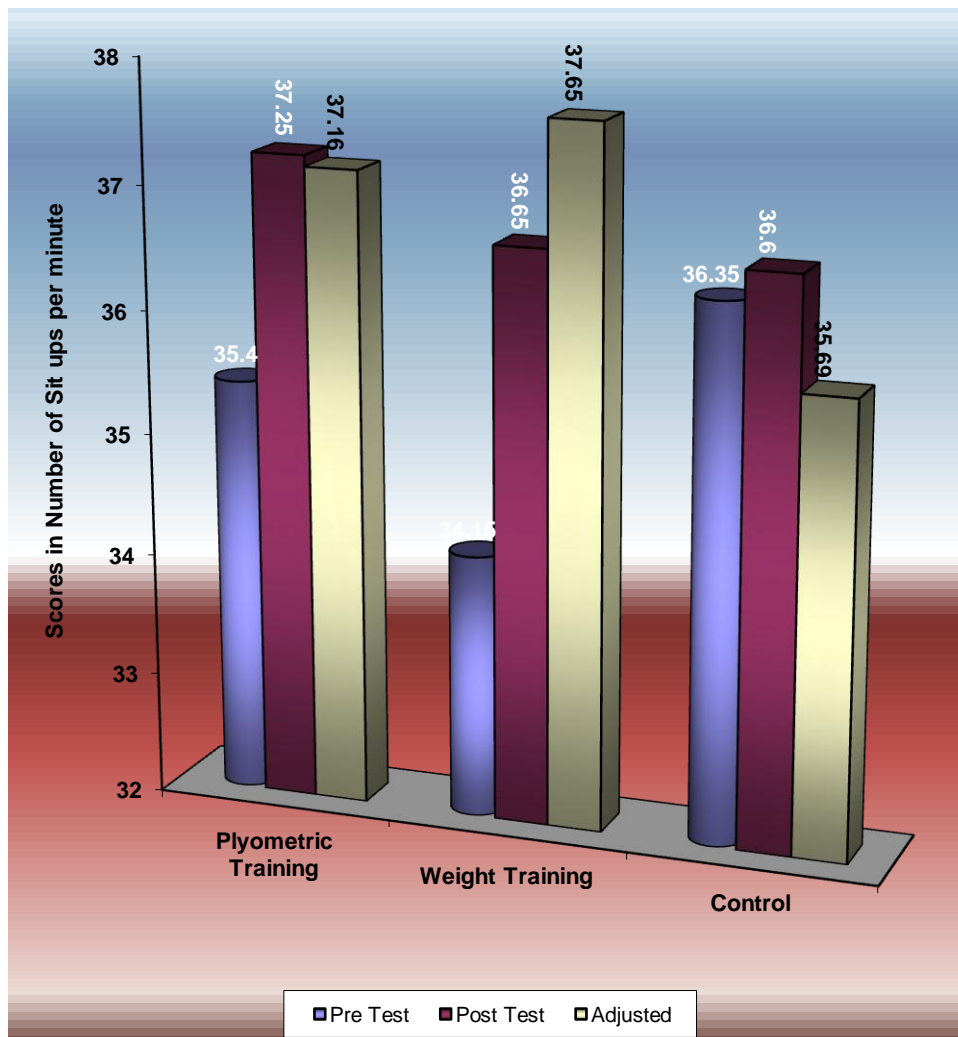
MEANS				Required C I
Plyometric Training Group	Weight Training Group	Control Group	Mean Difference	
37.16	37.65		0.48	0.54
37.16		35.69	1.47*	0.54
	37.65	35.69	1.95*	0.54

\* Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Plyometric Training group and control group (MD: 1.47). There was significant difference between Weight Training group and control group (MD: 1.95). There was no significant difference between treatment groups, namely, Plyometric Training group and Weight Training group. (MD: 0.48).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure .

**Figure II**  
**BAR DIAGRAM SHOWING PRE TEST, POST TEST AND ORDERED ADJUSTED MEANS ON MUSCULAR ENDURANCE**



### DISCUSSIONS ON FINDINGS ON MUSCULAR ENDURANCE

In order to find out the effect of plyometric training and weight training on speed parameter Muscular endurance the obtained pre and post test means were subjected to ANCOVA and post hoc analysis through Scheffe's confidence interval test.

The effect of Plyometric Training and Weight Training on Muscular endurance is presented in Table The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F value 44.24 was greater than the required table F value to be significant at 0.05 level.

Since significant F value was obtained, the results were further subjected to post hoc analysis and the results presented in Table proved that there was significant difference between Plyometric Training group and control group (MD: 1.47) and Weight Training group and control group (MD: 1.95). Comparing between the treatment groups, it was found that there was no significant difference between Plyometric Training and Weight Training group among inter university basketball players.

Thus, it was found that Plyometric Training and weight training were significantly better than control group in improving Muscular endurance of the inter university basketball players.

## CONCLUSIONS

Within the limitations and delimitations of this study, the following conclusions were drawn.

1. It was concluded that plyometric training protocols significantly improved speed endurance of basketball players compared to control group. Comparing between treatment groups, it was found plyometric training was significantly better than weight training group.
2. It was concluded that plyometric training and weight training protocols significantly improved muscular endurance of basketball players compared to control group. Comparing between treatment groups, it was found there was no significant difference between plyometric training and weight training groups.

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