

Enhancement of Sprint Performance and Selected Criterion Variables through Ladder Training and Plyometric Training Capsules among Engineering College Male Athletes

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Abstract

This purpose study restricted to forty five (N=45) male athletes who were participated in Anna University Zone-16 inter collegiate Athletic meet during the year 2018-2019 were randomly selected as subjects. Their age ranged from 18 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent Ladder training, Group-II underwent Plyometric training and Group-III acted as Control. All the subjects were fully informed regarding the nature of the experimental methodology and the subjects gave their consent to participate in this investigation and selected to be measured on the selected subjects - Speed, Stride Length, Stride Frequency, Strength and Agility. To achieve the purpose of the present study, two training programmes namely Ladder Training and Plyometric Training were designed scientifically. These programmes were given to the subjects of respective groups such as group-I and group-II. The detailed procedures of these three training programmes are dealt with in detail. ANCOVA was used to find out the significant difference if any between the groups.

Key Words: Plyometric Training, Ladder Training and Sprints

Introduction

Sport is intimate, profound and even spiritual. It has reached the root of human existence and, as such, provided an area for the discovery of personal truth. Neither man nor did sport alone provide the completeness by existence. The word "training" means different things in different fields. Training denotes the process of preparation for some task. This process varyingly extends to a number of days and even months and years. The term "Training" is widely used in sports. In a narrow sense training is physical exercise for the improvement of performance. Training involves constructing an exercise programme to develop an athlete for a particular event. This increasing skill and energy capacities need equal consideration (*Singh, 1991*). Sports training

are the basic form of preparation of sportsmen. Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performances in sports competitions. The word training means different things in different fields. In sports, the word training means doing physical exercises. In a narrow sense, training is doing physical exercises for the improvement of performance. The concept is reflected in short terms, which are given to separate components of training or to separate methods or procedures of doing physical exercises.

Circuit Training

Circuit Training is a great way to build a variety of fitness components and skills, particularly for larger groups of athletes. It features multiple stations where athletes

perform assigned activities for specific periods of time or until they have completed a set number of repetitions, and then they rotate.

Plyometric Training

Plyometrics, or bounding exercises, are excellent for building power, coordination, and explosiveness. Boxes are sometimes used to capitalize on the effect of gravity for additional resistances.

Strength Training

Strength Training requires athletes to use resistances to build strength, endurance, and size. Barbells, resistance bands, machines, and other types of equipment that offer resistance can be used to build strength--even the athlete's own body weight.

Endurance Training

Endurance fitness can involve a variety of sustained activities that improve cardio respiratory function, or the heart and lungs. Jogging, swimming, and cycling are examples of activities that build aerobic

capabilities while improving muscular endurance.

Methodology

For this study restricted to forty five (N=45) male athletes who were participated in Anna University Zone-16 inter collegiate Athletic meet during the year 2018-2019 were randomly selected as subjects. Their age ranged from 18 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent Ladder training, Group-II underwent Plyometric training and Group-III acted as Control. All the subjects were fully informed regarding the nature of the experimental methodology and the subjects gave their consent to participate in this investigation. Taking into consideration of all these factors, a set of variables were selected to be measured on the selected subjects. Speed, Stride Length, Stride Frequency, Strength and Agility were taken from each subject for the estimation of these selected variables.

Table – 1

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Speed of Experimental groups and Control group

Test	Ladder Training Group	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	7.72	7.65	7.67	Between groups	0.04	2	0.02	0.55
				Within groups	1.44	42	0.03	
Post-Test Mean	6.74	6.73	7.69	Between groups	9.18	2	4.59	45.68*
				Within groups	4.22	42	0.10	
Adjusted Post-Test Mean	6.71	6.76	7.70	Between sets	9.33	2	4.67	58.39*
				Within Sets	3.28	41	0.08	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23 (Speed scores are in Seconds)

Table- 1 shows that the obtained F-ratio value 0.55 for pre test mean of Ladder Training group, Plyometric Training group and Control group on Speed is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 45.68 for post test mean of Ladder Training group, Plyometric Training group and Control group on Speed is more than the required table value of 3.22 for significance with df 2

and 42 at 0.05 level of confidence.

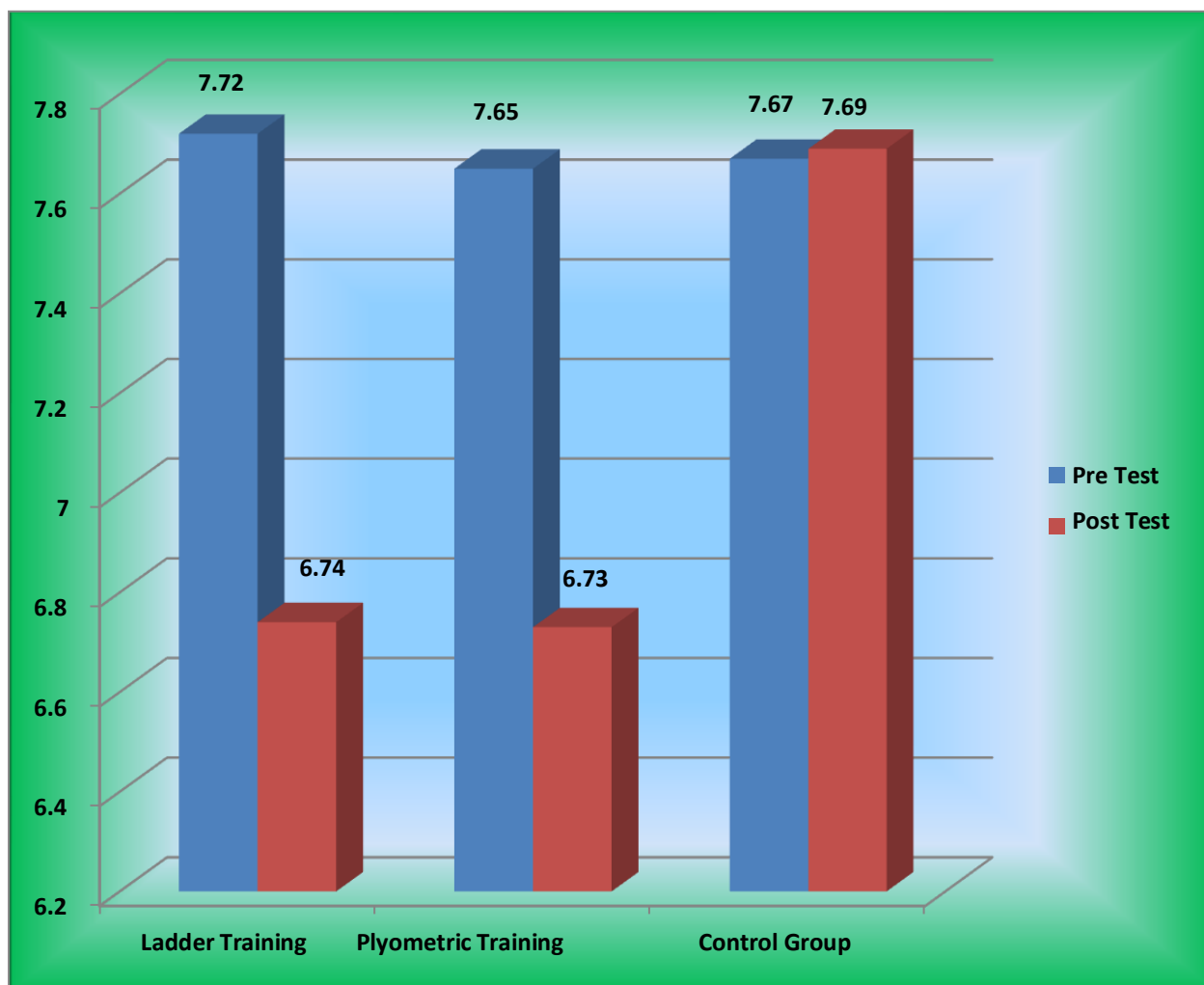
The obtained F-ratio value of 58.39 for adjusted post test mean of Ladder Training group, Plyometric Training group and Control group on Speed is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Ladder Training group, Plyometric Training group and Control group on Speed.

Figure -1

The Pre and Post test Mean Values of Ladder Training group, Plyometric Training group and Control group on Speed

Table 2



Computation of Analysis of Covariance of pre test, post test and adjusted post test on Stride Length of Experimental groups and Control group

Test	Ladder Training Group	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	1.53	1.52	1.51	Between groups	0.002	2	0.001	0.88
				Within groups	0.06	42	0.001	
Post-Test Mean	1.76	1.74	1.53	Between groups	0.49	2	0.24	379.26*
				Within groups	0.49	42	0.24	
Adjusted Post-Test Mean	1.76	1.74	1.53	Between sets	0.46	2	0.23	421.82*
				Within Sets	0.02	41	0.001	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23 (Stride Length scores are in Metes)

Table 2 shows that the obtained F-ratio value 0.88 for pre test mean of Ladder Training group, Plyometric Training group and Control group on Stride Length is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 379.26 for post test mean of Ladder Training group, Plyometric Training group and Control group on Stride Length is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 421.82 for adjusted post test mean of Ladder Training group, Plyometric Training group and Control group on Stride Length is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Ladder Training group, Plyometric Training group and Control group on Stride Length.

Figure – 2

The Adjusted Post Test Mean Values of Ladder Training group, Plyometric Training group and Control group on Stride Length

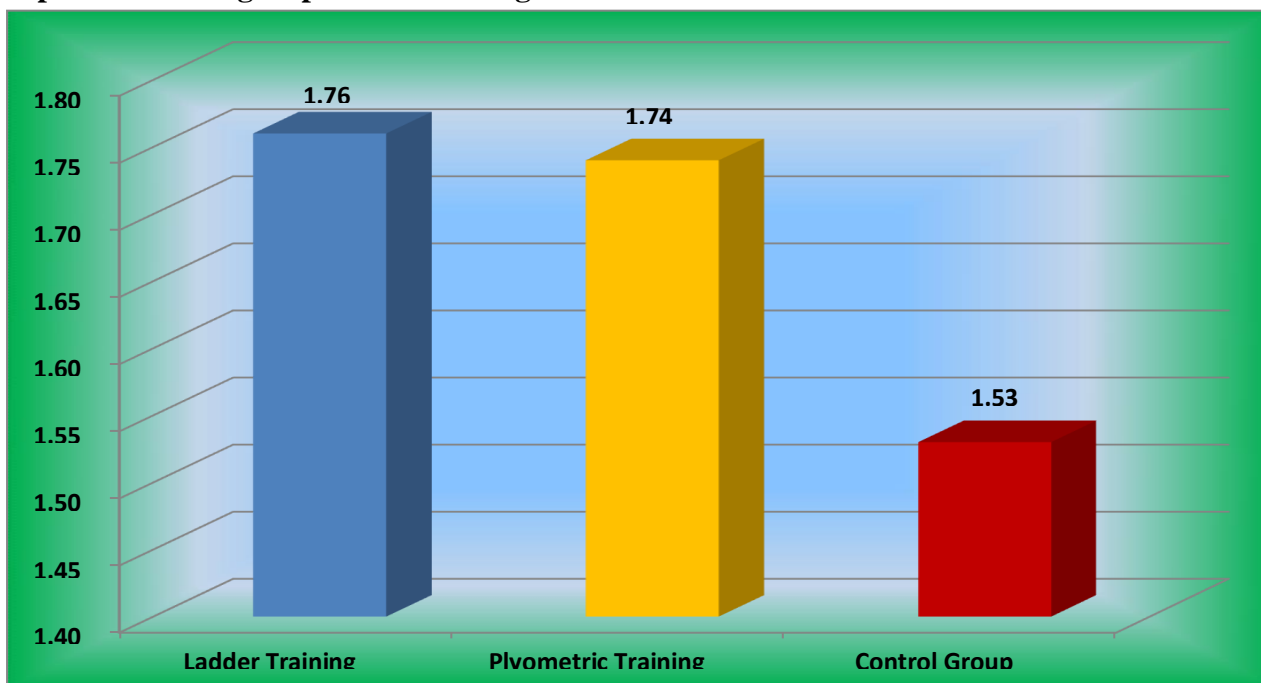


Table 3

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Stride Frequency of Experimental groups and Control group

Test	Ladder Training Group	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	3.83	3.81	3.84	Between groups	0.006	2	0.003	1.20
				Within groups	0.12	42	0.002	
Post-Test Mean	4.05	4.03	3.83	Between groups	0.44	2	0.22	73.99*
				Within groups	0.12	42	0.003	
Adjusted Post-Test Mean	4.05	4.04	3.82	Between sets	0.49	2	0.25	225.87*
				Within Sets	0.05	41	0.001	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23 (Stride Frequency scores are in Numbers)

Table-4.8 shows that the obtained F-ratio value 1.20 for pre test mean of Ladder Training group, Plyometric Training group and Control group on Stride Frequency is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 73.99 for post test mean of Ladder Training group, Plyometric Training group and Control group on Stride Frequency is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 225.87 for adjusted post test mean of Ladder Training group, Plyometric Training group and Control group on Stride Frequency is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Ladder Training group, Plyometric Training group and Control group on Stride Frequency.

Figure - 3

The Adjusted Post Test Mean Values of Ladder Training group, Plyometric Training group and Control group on Stride Frequency

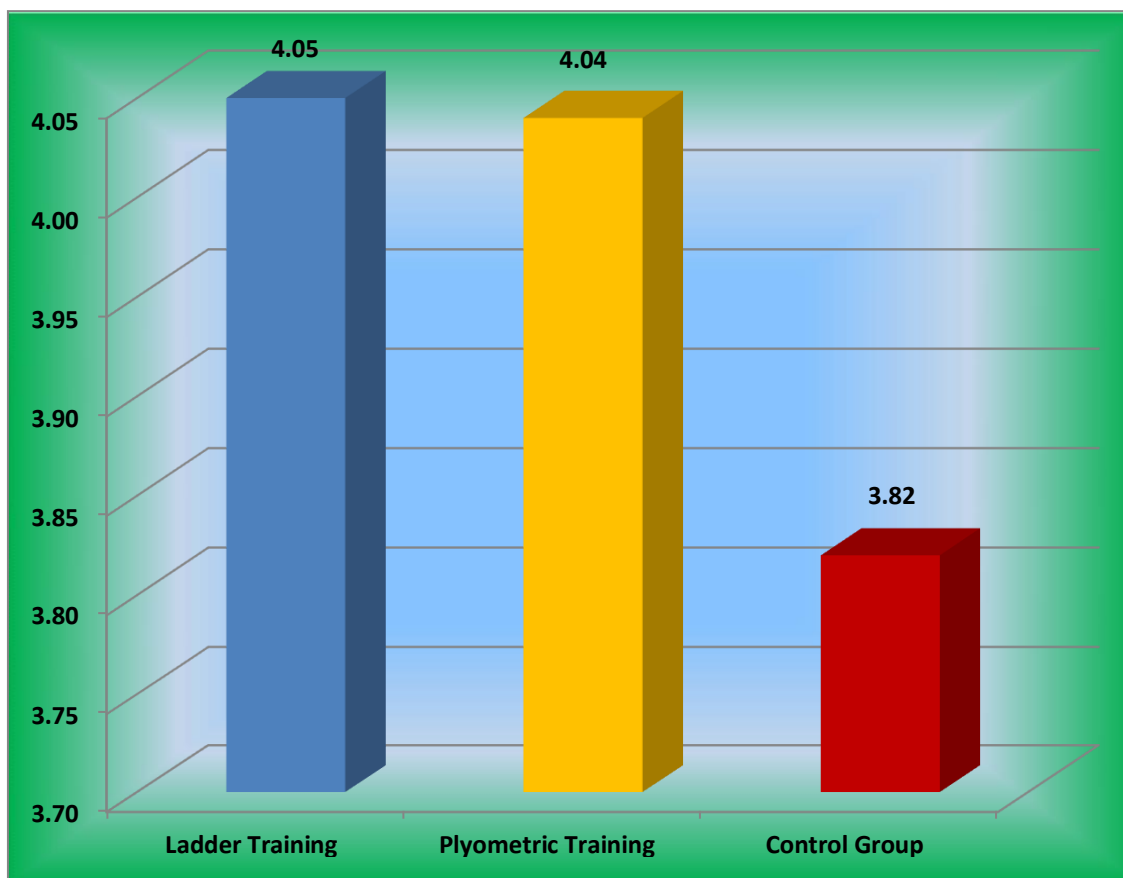


Table – 4

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Strength of Experimental groups and Control group

Test	Ladder Training Group	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	17.87	17.53	18.20	Between Groups	3.33	2	1.67	0.66
				Within Groups	105.87	42	2.52	
Post-Test Mean	20.60	24.07	18.27	Between groups	255.51	2	127.76	73.04*
				Within groups	73.47	42	1.75	
Adjusted Post-Test Mean	20.60	24.19	18.15	Between sets	268.34	2	134.17	91.80*
				Within Sets	59.92	41	1.46	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23 (Strength scores are in Numbers)

Table-4 shows that the obtained F-ratio value 0.66 for pre test mean of Ladder Training group, Plyometric Training group and Control group on Strength is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 73.04 for post test mean of Ladder Training group, Plyometric Training group and Control group on Strength is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 91.80 for

adjusted post test mean of Ladder Training group, Plyometric Training group and Control group on Strength is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Ladder Training group, Plyometric Training group and Control group on Strength.

Since, three groups are compared and whenever the obtained 'F' ratio for adjusted post test is found to be significant.

Figure - 4

The Adjusted Post Test Mean Values of Ladder Training group, Plyometric Training group and Control group on Strength.

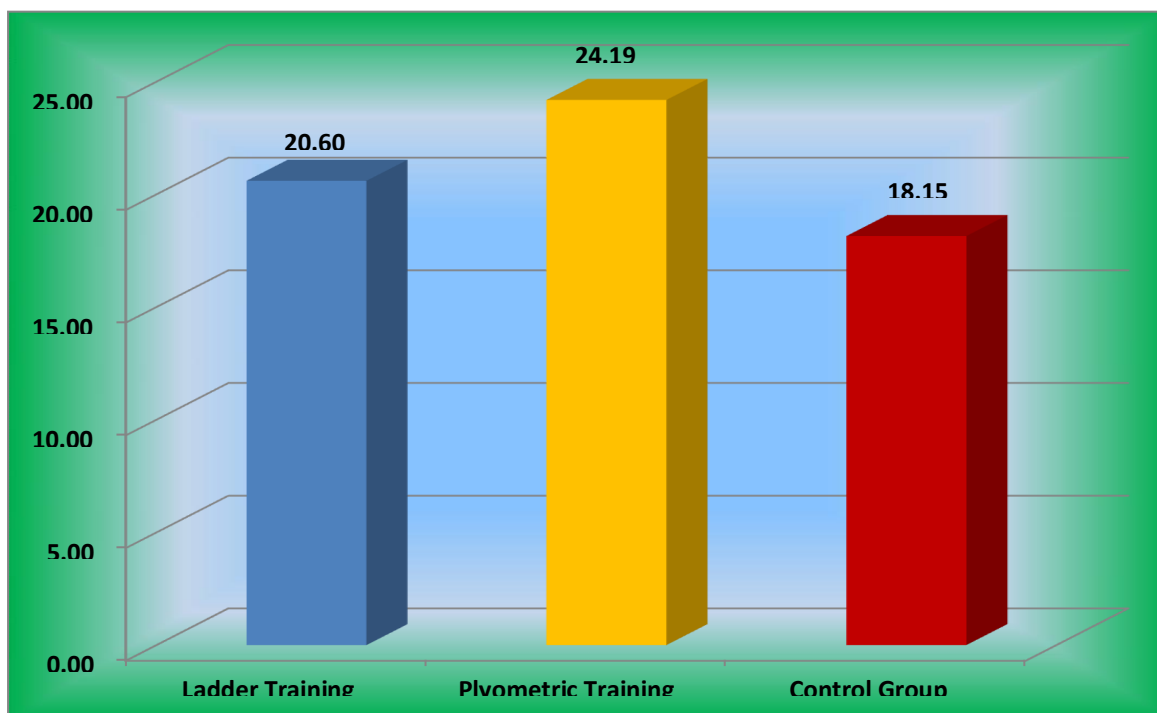


Table –5

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Agility of Experimental groups and Control group

Test	Ladder Training Group	Plyometric Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	10.54	10.58	10.63	Between groups	0.06	2	0.03	0.35
				Within groups	3.95	42	0.09	
Post-Test Mean	9.57	9.92	10.61	Between groups	8.46	2	4.23	85.80*
				Within groups	2.07	42	0.05	
Adjusted Post-Test Mean	9.59	9.92	10.59	Between sets	7.68	2	3.84	125.31*
				Within Sets	1.26	41	0.03	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23
 (Agility scores are in Seconds)

Table-5 shows that the obtained F-ratio value 0.35 for pre test mean of Ladder Training group, Plyometric Training group and Control group on Agility is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 85.80 for post test mean of Ladder Training group, Plyometric Training group and Control group on Agility is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

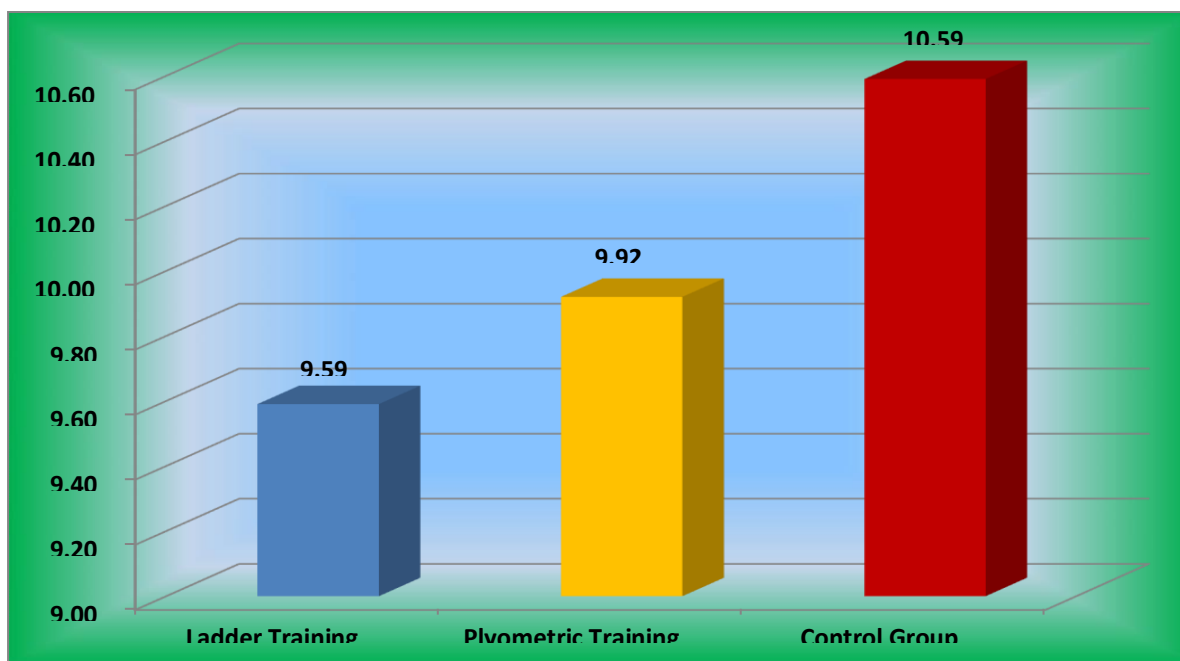
The obtained F-ratio value of 125.31 for

adjusted post test mean of Ladder Training group, Plyometric Training group and Control group on Agility is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Ladder Training group, Plyometric Training group and Control group on Agility.

Since, three groups are compared and whenever the obtained 'F' ratio for adjusted post test is found to be significant.

Figure - 5
The Adjusted Post Test Mean Values of Ladder Training group, Plyometric Training group and Control group on Agility.



Conclusions

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

The Experimental groups namely, Ladder Training and Plyometric Training had significantly improved all the selected

variables such as Speed, Stride Length, Stride Frequency, Strength and Agility.

Significant differences were also found among Ladder Training group Plyometric Training group and Control group all the dependent variables Speed, Stride Length, Stride Frequency, Strength, and Agility.

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