



EFFECT OF LADDER TRAINING ON AGILITY AND EXPLOSIVE POWER AMONG COLLEGE STUDENTS

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Abstract

The purpose of the present investigation was to find out the effects of ladder training on agility, explosive power and speed among college men. To achieve the purpose of this study, twenty-four men students studying in St. Johns College, Palayamkottai, Tirunelveli were selected randomly as participants. The participants were divided into two groups namely ladder training (experimental) group and control group of twelve (n=12) participants each. The experimental group underwent ladder training for six weeks of three sessions per week. The second group acted as control, which was not engaged in any special activities other than their regular curricular activities during the period of training. Among the physical variables the following variables was selected as criterion variables namely agility, and explosive power. All the participants were tested on selected criterion variables prior to and immediately after the training period. Agility, explosive power and speed test was assessed by seconds and coordination was assess by in number. The collected data were analyzed statistically by using dependent ‘t’ test to determine the differences if any among the group prior to and immediately after the training period on selected criterion variables separately. Analysis of covariance (ANCOVA) was used to determine the differences, if any among the adjusted posttest means on selected dependent variables separately. The level of significance was fixed at 0.05 level of confidence, which was considered as appropriate. The experimental group namely the ladder training group has achieved significant improvement on agility and explosive power. Significant differences were found

among ladder training group towards improving the selected criterion variables such as agility, and explosive power.

Key Words: Agility, Explosive Power, Ladder Training.

INTRODUCTION

Ladder training is a commonly used agility training method in sports and physical education to improve footwork, coordination, speed, and neuromuscular control. It involves performing a variety of quick stepping patterns through an agility ladder placed on the ground. These drills require rapid changes in direction, precise foot placement, and coordinated body movements, which help enhance an individual's agility and explosive power. Agility refers to the ability to change direction quickly and effectively while maintaining balance and control, whereas explosive power is the ability to exert maximum force in a short period of time. Both of these physical fitness components are essential for athletic performance and overall physical fitness among college students who participate in sports and recreational activities (**Bompa & Buzzichelli, 2019**). Regular participation in ladder training exercises can significantly improve lower body strength, reaction time, coordination, and neuromuscular efficiency. Studies have shown that structured agility ladder drills stimulate fast-twitch muscle fibers and improve the speed of muscle contraction, which contributes to better explosive movements such as jumping, sprinting, and quick directional changes. Therefore, incorporating ladder training into physical conditioning programs for college students may help enhance agility and explosive power, thereby improving overall athletic performance and physical fitness levels (**Brown & Ferrigno, 2015**).

STATEMENT OF THE PROBLEM

The purpose of this study was to determine the effects of a six-week ladder training program on agility, explosive power and speed in college male students.

METHODOLOGY

SELECTION OF VARIABLES

Dependent Variables

Since agility, explosive power and speed can play an important role in almost all games and sports. So, the agility, explosive power and speed were selected as dependent variables for this study.

Independent Variables

Ladder training was selected as independent variables.

SELECTION OF TESTS

Table I

TESTS SELECTION

Sl. No.	Criterion Variables	Test	Unit of Measurement
1.	Agility	Illinois's Agility Test	In seconds
2.	Explosive Power	Centimeters	In centimeters
3.	Speed	50 m run	In seconds

Table II

INTRA CLASS CO-EFFICIENT OF CORRELATION ON SELECTED DEPENDENT VARIABLES

Sl. No.	Variables	'R' Value
1.	Agility	0.87*
2.	Explosive Power	0.88*
4.	Speed	0.91*

*Significant at .01 level of confidence (Table value required for significance at 0.01 level of confidence is 0.77).

Since the obtained 'R' values were higher than the required value, the data were accepted as reliable in terms of instruments, tester and the participants.

PILOT STUDY

A pilot study was conducted to assess the initial capacity of the participants to fix the load, select the exercises and to design the training programme. Ten men participants were selected at random for this purpose, and they were given ladder training under the watchful eyes of the investigator. While constructing the training programmes the basic principles of sports training (Progression of overload and specificity) were followed. During construction of the training programme, the individual differences were also being considered.

STATISTICAL TECHNIQUES

The criterion variables were statistically analyzed with dependent "t" test to find out the significant improvement between pre and post-test means of both groups and analysis of covariance (ANCOVA) was used to find out the significant difference between experimental and control groups.

ANALYSIS OF DATA

Agility (Illinois Agility test)

The analysis of dependent 't'-test on the data obtained for agility of the pre-test and post-test means of experimental and control groups have been analyzed and presented in table III.

Table III

THE SUMMARY OF MEAN AND DEPENDENT 't' TEST FOR THE PRE AND POST TESTS ON AGILITY OF EXPERIMENTAL AND CONTROL GROUPS

Mean	Experimental Group	Control Group
Pre test Mean	18.11	18.22
Post test Mean	16.90	18.30
't' test	4.20*	0.18

*Significant at 0.05 level of confidence. Agility scores in Seconds

(Table value required for significance at 0.05 level for 't' test with df 11 is 2.201)

From the table III, the dependent 't'-test values between the pre and posttests means of experimental and control groups were 4.20 and 0.18 respectively. Since the obtained 't'-test value of experimental group was greater than the table value 2.201 with df 11 at 0.05 level of confidence, it is concluded that experimental group had significant improvement in the performance of agility. However, control group has no significant improvement in the performance of agility.

The analysis of covariance (ANCOVA) on agility of experimental and control groups have been analyzed and presented in table IV.

Table IV

ANALYSIS OF COVARIANCE ON AGILITY OF EXPERIMENTAL AND CONTROL GROUPS

Adjusted Post Test Means		Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Ladder Training	Control					
16.95	18.30	Between	121.31	1	121.31	11.87*
		Within	214.52	21	10.22	

*Significant at .05 level of confidence. Agility scores in Seconds

(The table value required for significance at 0.05 level with df 1 and 21 is 4.32).

From the table IV, the adjusted posttest mean values of agility for experimental and control groups are 16.85 and 18.30 respectively. The obtained F-ratio of 4.71 for adjusted posttest mean is more than the table value of 4.32 for df 1 and 21 required for significance at 0.05 level of confidence. The results of the study indicate that there was significant difference between the adjusted posttest means of experimental and control groups on the development of agility.

Explosive Power (Vertical Jump Test)

The analysis of dependent 't'-test on the data obtained for explosive power of the pre-test and post-test means of experimental and control groups have been analyzed and presented in table V.

Table V
THE SUMMARY OF MEAN AND DEPENDENT 't' TEST FOR
THE PRE AND POST TESTS ON EXPLOSIVE POWER OF
EXPERIMENTAL AND CONTROL GROUPS

Mean	Experimental Group	Control Group
Pretest Mean	35.01	36.25
Posttest Mean	40.41	36.87
't' test	9.45*	0.87

*Significant at 0.05 level of confidence. **Explosive power scores in centimeters**

(Table value required for significance at 0.05 level for 't' test with df 11 is 2.201)

From the table III, the dependent 't'-test values between the pre and posttests means of experimental and control groups were 9.45 and 0.87 respectively. Since the obtained 't'-test value of experimental group was greater than the table value 2.201 with df 11 at 0.05 level of confidence, it is concluded that experimental group had significant improvement in the performance of explosive power. However, control group has no significant improvement in the performance of explosive power.

The analysis of covariance (ANCOVA) on explosive power of experimental and control groups have been analyzed and presented in table VI.

Table VI
ANALYSIS OF COVARIANCE ON EXPLOSIVE POWER OF
EXPERIMENTAL AND CONTROL GROUPS

Adjusted Post Test Means		Source of Variance	Sum of Squares	df	Mean Squares	'F'-Ratio
Ladder Training	Control					
40.12	36.56	Between	650.71	1	650.71	10.97*
		Within	1245.25	21	59.3	

*Significant at .05 level of confidence. **Explosive power scores in Seconds**

(The table value required for significance at 0.05 level with df 1 and 21 is 4.32).

From the table VI, the adjusted posttest mean values of explosive power for experimental and control groups are 40.12 and 36.56 respectively. The obtained F-ratio of 10.97 for adjusted posttest mean is more than the table value of 4.32 for df 1 and 21 required for significance at 0.05 level of confidence. The results of the study indicate that there was significant difference between the adjusted posttest means of experimental and control groups on the development of explosive power.

CONCLUSIONS

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

The experimental group namely the ladder training group has achieved significant improvement on agility, and explosive power.

Significant differences were found among ladder training group towards improving the selected criterion variables such as agility, and explosive power.

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