



EFFICACY OF LADDER AND PLYOMETRIC TRAINING ON AGILITY AMONG JUMPERS

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Abstract:

The purpose of the study was to investigate the efficacy of ladder and plyometric training on agility among jumpers. To facilitate the study, thirty jumpers from various clubs in Chennai city, Tamilnadu, India were selected as subjects at random and their ages between 14 to 17 years. The subjects were divided into three equal groups. Group-I performed ladder training, group-II performed plyometric training and group-III was control. Agility was assessed by Illinois agility run test. The subjects were involved with their respective training for a period of 12 weeks. At the end of the twelfth weeks of the training post-tests were taken. The significant differences between the means of experimental group and control group for the pre-test and post-test scores were determined by paired 't' ratio and ANCOVA. The level of significance was fixed at 0.05 level of confidence for the degree of freedom 14. The ladder training and plyometric group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level. In the control group the obtained 'f' value on agility were failed to reach the significant level.

Key Words: Agility, Ladder, Plyometric & Jumpers.

Introduction:

A ladder is an excellent piece of training equipment and is useful to enhance body control and agility and increase the foot speed. For this training need not to go out and purchase the own Ladder, it is just as easy to use throw-down lines and as far as juniors are concerned, they may be found to be better as there is no chance of their getting tangled up in the Ladder. The added advantage of lines is that the distance between them can be changed to suit various exercise patterns. Using a building block system of skill development is very important to achieve success in training with a Ladder. The training start with general development up to advanced skill development, from a full range of motion to smaller, quicker movements. Keeping in mind the principle of working from slow and controlled movements and moving onto fast, explosive movements as a teaching and learning progression will have a greater amount of success.

Plyometrics is the term given to exercises designed to increase the power of an athlete. It is defined as the equivalent of explosive strength and referred to by others as "speed-strength". In layman's terms, the aim of plyometrics is to increase the explosiveness of the muscle allowing an athlete to run faster, jump further, or generate force at a greater rate. Plyometric training is a form of training that is used to help develop and enhance explosive power, which is a vital component in a number of athletic performances. This training method is meant to be used with other power development methods in a complete training program to improve the relationship between maximum strength and explosive power. The modern history of Plyometrics is somewhat brief but not relatively new. This technique was originated in Russia and Eastern Europe in the middle of 1960. The Soviets were very successful in the use of Plyometrics in their training programmes, especially in track and field. This technique was originally known as the "Shock Method of Training". Yuri Verhoshansky, a Russian coach whose success with jumpers is legendary, could very well be called the "Father of Plyometrics". He had tried and succeeded in increasing his athletes' reactive abilities by experimenting with exercises like the depth jump. He has been the leading researcher and coach most recognized with the spread of Plyometrics. He also has been credited with most of the forms of plyometric training that are still in use today (Coetzee, 2007).

Methodology:

The purpose of the study was to investigate the efficacy of ladder and plyometric training on agility among jumpers. To facilitate the study, thirty jumpers from various clubs in Chennai city, Tamilnadu, India were selected as subjects at random and their ages between 14 to 17 years. The subjects were divided into three equal groups. Group-I performed ladder training, group-II performed plyometric training and group-III was control. Agility was assessed by Illinois agility run test. The subjects were involved with their respective training for a period of 12 weeks. At the end of the twelfth weeks of the training post-tests were taken. The significant differences between the means of experimental group and control group for the pre-test and post-test scores were determined by paired 't' ratio and ANCOVA. The level of significance was fixed at 0.05 level of confidence for the degree of freedom 14.

Results:

Table 1: Descriptive Analysis of the Data on Agility

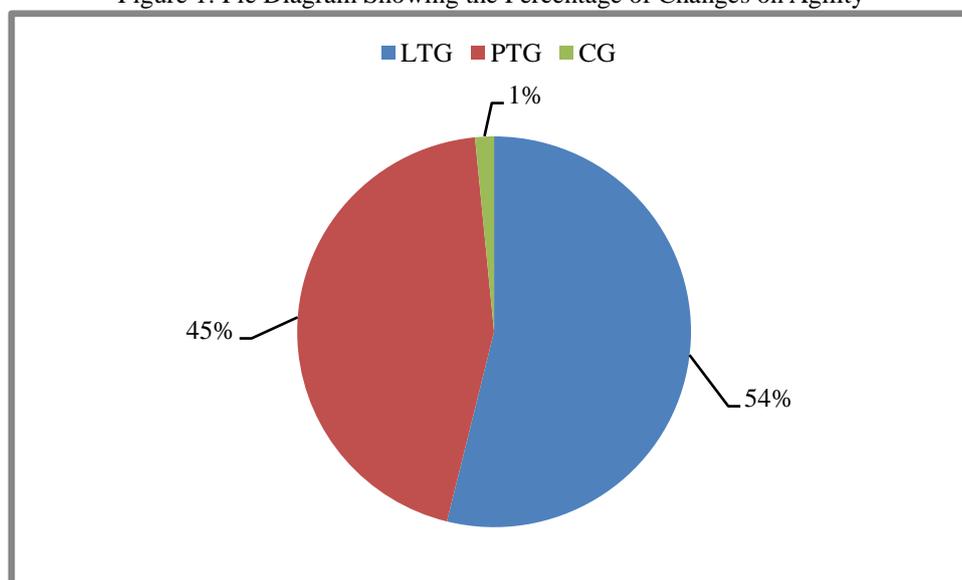
Name of the Group	Testing Period	Mean Score	SD	MD	Obtained 't' Ratio	Magnitude of Changes
Ladder Training Group	Pre	18.25	0.93	2.04	4.91*	11.11
	Post	16.21	0.38			
Plyometric Training Group	Pre	18.14	0.75	1.67	3.84*	9.20
	Post	16.47	0.54			
Control Group (CG)	Pre	18.21	1.01	0.06	0.39	0.32
	Post	18.15	1.06			

Table Value for 11 degrees of freedom is 2. 20

*Significant at 0.05 level of confidence

Table 1 shows that the obtained 't' values 4.91, 3.84 and 0.39 respectively of the ladder, plyometric and control groups are higher than the table value (2.14) required for significant at 05 level for 14 degrees of freedom. It exposed that significant mean differences existed on agility between the pre and post test scores of experimental groups. On the other hand, insignificant differences were found between the pre test and post test means of control group on agility as, the obtained 't' value 0.39 is lesser than the table value (2.14) required for significance. The result of the study produced 11.11%, 9.20% and 0.32% of improvement due to ladder, plyometric and control group on agility. The magnitude of changes on agility of ladder, plyometric and control groups are graphically shown in figure I for better understanding.

Figure 1: Pie Diagram Showing the Percentage of Changes on Agility



The data collected from the three groups on agility was statistically analyzed by ANCOVA and the outcomes are presented in table 2.

Table 2: Analysis of Covariance on Agility of Experimental and Control Groups

	Ladder Training	Plyometric Training	Control Group	S o v	SS	df	MS	Obtained 'F' ratio
Pretest Mean	18.25	18.14	18.21	B	0.21	2	0.10	0.13
SD	0.93	0.75	1.01	W	32.17	42	0.76	
Posttest Mean	16.21	16.47	18.15	B	11.06	2	5.53	7.00*
SD	0.38	0.54	1.06	W	33.18	42	0.79	
Adjusted Posttest Mean	16.17	16.45	18.13	B	11.35	2	5.67	7.12*
				W	32.64	41	0.79	

(Table value for df 2 & 42 and 2 & 41 is 3.21 & 3.22)

*Significant at 0.05 level

Table 1 reveals that the indicated that the obtained 'F'-ratio for the pre-test means among the groups on agility were 18.25 for experimental group – I, 18.14 for experimental group – II and 18.21 for control group.

The obtained 'F'-ratio 0.13 was lesser than the table 'F'-ratio 3.21. Hence the pre-test mean 'F'-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. The post-test means were 16.21 for experimental group – I, 16.47 for experimental group – II and 18.15 for control group. The obtained 'F'-ratio 7.00 was higher than the table 'F'-ratio 3.21. Hence the post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. The adjusted post-test means were 16.17 for experimental group – I, 16.45 experimental group – II and 18.13 for control group. The obtained 'F'-ratio 7.12 was higher than the table 'F'-ratio 3.22. Hence the adjusted post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. It was concluded that there was a significant mean difference among ladder training group, plyometric training group and control group, in developing agility of the jumpers.

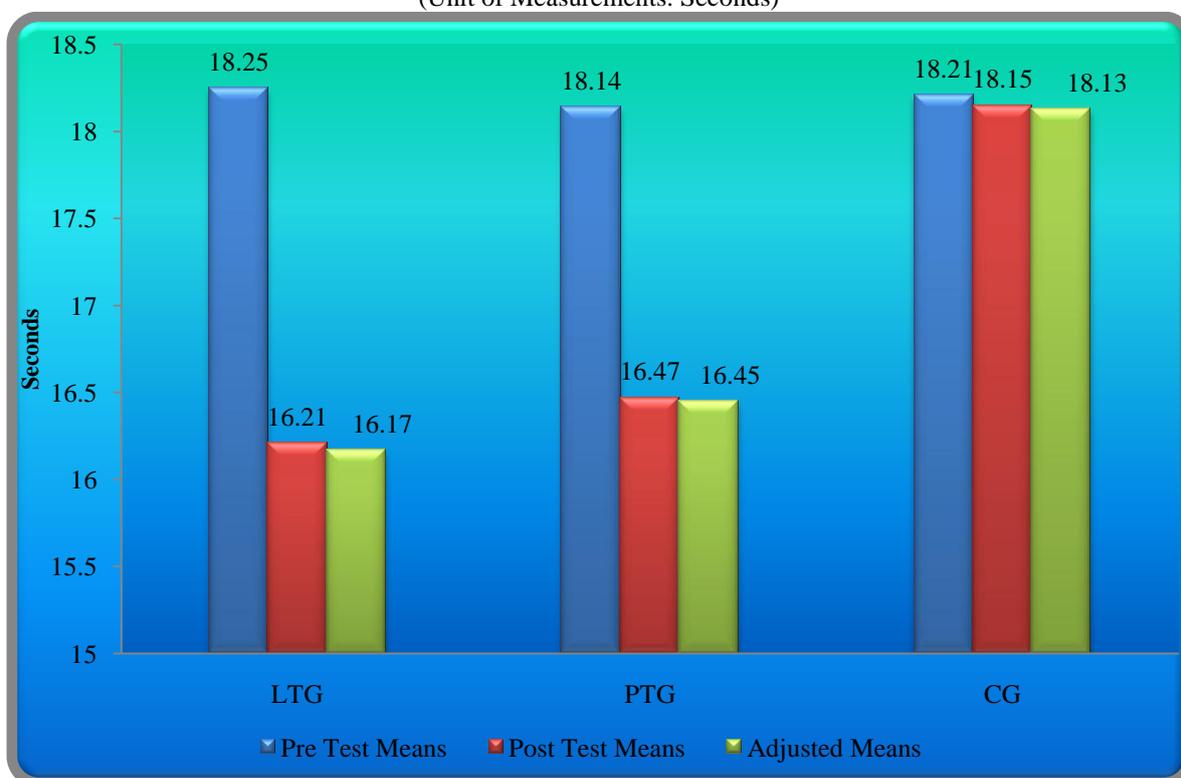
Table 3: Scheffe's Post Hoc Test on Agility of Experimental and Control Groups

Ladder Training	Plyometric Training	Control Group	MD	C I
16.17	16.45	--	0.28	0.98
16.17	--	18.13	1.96*	0.98
--	16.45	18.13	1.68*	0.98

* Significant

Table 3 shows the post hoc analysis obtained on adjusted post test means. The mean difference required for the confidential interval to be significant was 0.98. It was observed that the ladder training and plyometric training group significantly improved agility better than the control group.

Figure 2: Graphical Representation of the Mean Values on Agility of Ladder, Plyometric and Control Groups (Unit of Measurements: Seconds)



Conclusions:

- ✓ The ladder training group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level.
- ✓ The plyometric training group produced significant improvement in agility. The 'f' values of the selected variables have reached the significant level.
- ✓ In the control group the obtained 'f' value on agility were failed to reach the significant level.

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