



## IMPACT OF LADDER TRAINING ON AGILITY BALANCE AND COORDINATION AMONG SCHOOL STUDENTS

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### ABSTRACT

The purpose of the study was to find out the **impact of ladder training on agility balance and coordination among school students**. The study was conformed to 24 male students selected from government boys higher secondary school, Sankari, Salem district, Tamilnadu, and their age ranged between 14 to 18 years. They were divided into two equal groups each group consisted of 12 players. Namely experimental group (Ladder Training group), and control group. They were tested twice before and after the training with respect to physical variables of **agility, balance and coordination**. The training period for this study was three alternative days per week, for six weeks. The collected data 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. In all the cases 0.05 level of significant was fixed to test the hypothesis. It was concluded that the experimental groups having more significant improvement, than the control group.

### KEYWORDS

Agility, Balance, Coordination and Ladder Training.

### Introduction

The word "training" has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. Training is not a recent discovery. In ancient times, people systematically trained for military and Olympic endeavours. Today athletes prepare themselves for a goal through training. Training represents a long term endeavour. Athletes are not developed overnight and a coach cannot create miracles by cutting corners through overlooking scientific and methodical theories (Bompa, 1999).

### Sports Training

Scientific training methods and application of basic principles of body mechanics in sports skill have been attributed to the higher level of performance in sports skills. Performance is the combined result of coordinated exertion and integration of a variety of functions. Genetic factor probably plays an important role in an individual's performance. It appears that up to seventy percent of an individual's maximal force, power or capacity is a matter of genetic factor. The environments as well as geographic location to play an important role in performance. Moreover performance to a certain extent depends upon the physical and motor fitness qualities in which definite improvement can be achieved through appropriate training (Bourchers and Malina, 1999).

### Ladder Training

The agility ladder is a time-tested and proven effective tool for improving your footwork. The training effect is similar to jump rope, but with several advantages. First, agility ladder training is multi-directional. In most sports, you are not staying in one spot. You are moving forward, sideways and sometimes backwards. Second, your feet are also allowed to move independently in more complex patterns than a jump rope allows. And third, the cycle time can be increased greatly, because you are not limited by the speed of the rope turn. The end result is that you can train your feet to move quickly through complex footwork patterns. The benefits to any ground-based sport are huge. Agility ladder training will improve your speed, coordination, timing and balance. Plus, it will set your calves on fire. I'm not a muscle isolationist, but this is seriously effective calf training because it engages the fast twitch muscles. Olympic lifts, sprinting and other power training will help you move large distances quickly and that is a very important

component of sports movement. Agility ladder training will add precision to those last few steps that get your body into perfect position. The importance of quick adjustment steps cannot be understated. They are like putting in golf.

Agility ladders come in various sizes, ranging from 5 yards to 10 yards, and sometimes even more. Being lightweight and portable, these ladders can be conveniently carried and used outdoors as well as indoors. Speed training agility ladder are used by coaches in several sports, ranging from baseball to boxing. Nowadays, these ladders are also used in schools by the physical education instructors in order to train students. If you don't own one, you can build agility ladders of your own, using wood or thick rope. In one of the variants of agility ladder training, vehicle tires are used, instead of agility ladders, to practice training drills. A simpler form of this equipment, the simulated agility ladder marked with rope or chalk on some flat surface, is also quite popular.

### Agility

Agility is the ability to maintain or control body position while quickly changing direction during a series of movements. Agility training is thought to be a re-enforcement of motor programming through neuromuscular conditioning and neural adaptation of muscle spindles, golgi-tendon organs, and joint proprioceptors. By enhancing balance and control of body positions during movement, agility theoretically should improve. (Ajmer Singh, Jagdish bains, Jagtar sing gill, Rachhpal singh brar and Nirmaljit kaur rathee 2008). The ability to perform a series of explosive power movements in rapid succession in opposing direction like Zigzag running or cutting movement. (Mahaboobjan 2010) agility is the ability to change or quickly and accurately the direction of one's body movement during physical activity like volleyball and kabaddi.

### Balance

Balance is needed by runners when negotiating woodland, by tennis players when reaching for a drop shot and by footballers taking the ball on the volley from slightly behind themselves. Each of these situations requires the exercise of just the right amount of flexibility and agility at the right time and from the right areas of the body in order for us to execute the desired task, recover and then be able to repeat the same or similar tasks without injury. With balance training, as with most training, the idea is to recreate and manipulate in a controlled environment what we do in an

event or game situation. Balance is the correct alignment. (Dean and Greg Brittenham 1997) The proper relationship between the core and the legs, feet, hands and head is essential to achieving correct body alignment

**Coordination**

Coordinative abilities enable the sports man to do a group of movements with better quality and effect. The speed of learning of skill and its stability is directly dependent on the level of various coordinative abilities. Coordinative abilities are needed for maximal utilization of conditional abilities, technical skills and tactical skills (Singh, 1991).

**Methodology**

The purpose of the study was to find out the impact of ladder training on agility balance and coordination among school students. To achieve the purpose of the study 24 men students were selected from Government Boys Higher Secondary School Sankari, Salem, Tamil Nadu as subjects. Their age ranged from 14 to 18 years. They were divided in to two equal groups each group consisted of 12 players. Namely experimental group and control group. The experimental group underwent ladder training including their regular training for three days per week for six weeks, whereas the control group did not expose any special training except their regular training. To achieve the purpose of this study the following agility, balance and coordination the criterion variable were selected and measured with Illinois agility test, stock stand and hand eye coordination.

**Training Programme**

During the training period, the experimental groups underwent their respective training programmes in addition to their regular routine. Group A underwent ladder training for three days per week for six weeks. The duration of training session in all the days were between one hour to one and half hour approximately, which included warm-up and warm-down. Group B acted as control that did not participate in any specific training on par with experimental groups. All the participants involved in this study were carefully monitored throughout the training programme to be away from injuries. They were questioned about their health status throughout the training programme. None of them reported with any injuries. However, muscle soreness appeared in the earlier period of the training programme and was reduced in due course.

**Analysis Of The Data**

The subjects of both the groups were tested on agility, balance and coordination at prior and immediately after the training programme. The selected 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. In all the cases 0.05 level of significant was fixed to test the hypothesis.

**TABLE – I THE SUMMARY OF MEAN AND DEPENDENT AND T TEST FOR THE PRE AND POST TESTS ON AGILITY BALANCE AND CO-ORDINATION OF EXPERIMENTAL AND CONTROL GROUPS**

Mean	Experimental Group			Control Group		
	Agility	Balance	Co-ordination	Agility	Balance	Co-ordination
<b>Pre Test</b>	18.20	25.13	27.12	18.50	24.94	26.75
<b>Post Test</b>	16.44	33.40	32.13	18.38	25.02	26.85
<b>T` Test</b>	4.12	6.17	5.33	0.22	0.29	0.10

\*Significant at 0.05 level of confidence. Agility, Balance scores in Seconds and Co-ordination in numbers.

From the Table - I, shows on the pre test mean value of agility, balance and co-ordination for Experimental group were 18.20, 25.13, 27.13 and Control group were 18.50, 24.94, 26.75

respectively. The post test means value of agility, balance and co-ordination for Experimental group were 16.44, 33.40, 32.13 and Control group were 18.38, 25.02, 26.85 respectively. The dependent 't'-test values between the pre and post tests means for agility, balance and co-ordination in Experimental group were 4.12, 6.17 and 5.33 and Control group were 0.22, 0.29 and 0.10 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, balance and co-ordination. However, control group has no significant improvement in the performance of agility, balance and co-ordinations.

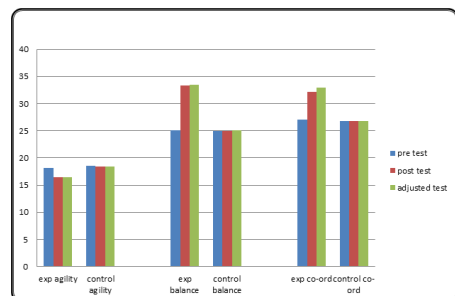
**Table II ANALYSIS OF COVARIANCE ON AGILITY BALANCE AND CO-ORDINATION OF EXPERIMENTAL AND CONTROL GROUPS**

Variables	Adjusted Post Test Means		Source of Variance	Sum of Squares	df	Mean Squares	F ratio
	Experimental Group	Control Group					
Agility	16.50	18.39	Between	2.12	1	2.12	6.24*
			Within	7.23	21	0.34	
Balance	33.41	25.06	Between	123.15	1	123.15	5.66*
			Within	457.21	21	21.77	
Co-ordination	32.90	26.78	Between	204.40	1	204.44	7.31*
			Within	587.54	21	27.98	

\*Significant at 0.05 level of confidence. Agility, Balance scores in Seconds and Co-ordination in numbers.

From the Table-II, the adjusted post test mean values of agility balance and co-ordination for experimental group are 16.50, 33.41 and 32.90 were as the control group values are 18.39, 25.06 and 26.78 respectively. The obtained F-ratio of agility-6.24, balance-5.66 and co-ordination-7.31 for adjusted post test 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 post test means of experimental and control groups on the development of agility, balance and co-ordination.

The pre test, post test and adjusted post test mean values of experimental and control groups on agility, balance and co-ordination are graphically represented in the figure 1.



**Figure 1: Pre, Post and Adjusted Post Tests Mean Values of Experimental and Control Groups on Agility Balance and Co-ordinations.**

**Discussion on Findings**

The results of the study reveal that there was a significant changes found after the ladder training on agility balance and coordination. These results are in corroboration with the studies of Muthu Kumaran (1993) Salonikidis and Zafeiridis (2008)

## 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, balance, and coordination.
- Significant differences were found among ladder training group towards improving the selected criterion variables such as agility, balance, and coordination.

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