



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2024; 11(4): 25-28
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www.kheljournal.com
Received: 26-04-2024
Accepted: 04-06-2024

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Influence of ladder training on selected physical and physiological variables among school athletes

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Abstract

An agility ladder is a piece of equipment commonly used to increase the agility of an athlete. The ladder is placed on the ground where it can be used for a number of different drills and exercises. Some of these drills include the hop-scotch, in-out and tango drills. An agility ladder is often made from flexible material in order to avoid injuries caused by the athlete being tripped on the rungs. When laid on the ground the agility ladder creates a piece of exercise equipment that requires the user to quickly move his or her feet in between the rungs with precise coordination. Unlike a typical handyman's ladder the rungs of the ladder are usually not wide or deep and are often made of rope to avoid injuries while building conditioning agility and eye-to-foot coordination. The purpose of the study was to investigate the influence of ladder training on selected physical and physiological variables among school men athletes. To achieve the purpose of the present study 30 men students were selected as samples from Cheran. Hr. Sec. School, Punnam Chathiram, Karur, Tamilnadu, India. The age group is between 14 to 16 years. The selected subjects were divided in to two equal groups of each 15 namely experimental group and control group. The group I Ladder training for three days per week for six weeks, whereas the group II acted as control who maintained their daily routine activities and no special training was given to them. The following physical and physiological variables namely Speed, Explosive Power, Flexibility, Agility, Blood Pressure and Resting Heart Rate were selected as criterion variables. The measured by using 50 Meters Dash, Standing Broad Jump, T-Test and Sphygmomanometer test is used. The collected data were analyzed statistically through analysis of 't' ratio to find out the significant difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate. The results of the study showed that there were significant differences exist between ladder training group and control group on Speed, Explosive Power, Agility and Blood Pressure. And also ladder training group showed significant improvement on Speed, Explosive Power, Agility and Blood Pressure when compared to control group.

Keywords: Ladder training, speed, explosive power, agility and blood pressure

Introduction

Sports training is a basic preparation of the sportsman for better performance through physical exercise. It is based on scientific principles of aiming at education and performance enhancement sports activities consists of motor movement and action and their success depends to a great extent on how correctly they are performed. Techniques of training and improvement of tactical efficiencies plays a vital role in training process.

An agility ladder is a piece of equipment commonly used to increase the agility of an athlete. The ladder is placed on the ground where it can be used for a number of different drills and exercises. Some of these drills include the hop-scotch, in-out and tango drills. An agility ladder is often made from flexible material in order to avoid injuries caused by the athlete being tripped on the rungs. When laid on the ground the agility ladder creates a piece of exercise equipment that requires the user to quickly move his or her feet in between the rungs with precise coordination. Unlike a typical handyman's ladder the rungs of the ladder are usually not wide or deep and are often made of rope to avoid injuries while building conditioning agility and eye-to-foot coordination. Agility is important for any athlete for two reasons. Firstly, the more agile an athlete is the better he or she will be able to perform whilst in competition. Agility helps to improve the time taken for the body to react and readjust itself to an event. Secondly, an increased agility can also help to reduce common injuries that are associated with too much stress being put onto inflexible muscles.

Methodology

The purpose of the study was to investigate the influence of ladder training on selected physical and physiological variables among school men athletes. To achieve the purpose of the present study 30 men students were selected as samples from Cheran. Hr. Sec. School, Punnam Chathiram, Karur, Tamil Nadu, India. The age group is between 14 to 16 years. The selected subjects were divided in to two equal groups of each 15 namely experimental group and control group. The group I Ladder training for three days per week for six weeks, whereas the group II acted as control who maintained their daily routine activities and no special training was given to

them. The following physical and physiological variables namely speed, explosive power, agility and blood pressure were selected as criterion variables. The measured by using 50 meters dash, standing broad jump, t-test and sphygmomanometer test is used.

Training Schedule

The six-week training package is set up for this study. The circuit based ladder training is given. The training was given to the subjects for three days in a week (Monday, Wednesday and Friday) for six weeks.

Table 1: Circuit based ladder training programme

S. No	Name of the ladder training	Intensity		
		50% 1 st & 2 nd Weeks Repetition 45 Min	60% 3 rd & 4 th Weeks Repetition 45 Min	70% 5 th & 6 th Weeks Repetition 45 Min
1.	X-Over Zigzag	2	3	4
2.	Foot in each	2	3	4
3.	In in out	2	3	4
4.	X-Over Lateral	2	3	4
5.	Ickey Shuffle	2	3	4
6.	Lateral Foot Drill	2	3	4
7.	Five Count Drill	2	3	4
8.	Hop Scotch Drill	2	3	4
9.	Basic In-Out Pattern	2	3	4
10.	Basic Pattern	2	3	4

Statistical Technique

The data collected from the two groups namely ladder training group and control group on selected physical and physiological variables were statistically analyzed by using 'F' ratio in order to determine the differences if any among the groups at pretest, posttest and adjusted posttest. The calculated 'F' ratio is tested for significance at 0.05 level of

confidence.

Results and Discussions

The effect of independent variables on each of the dependent variables were determined by 'F' ratio separately and presented below.

Table 2: Calculation of 'F' ratio between the pre and post test scores for the experimental group and control group

Variables	Test	Ladder Training Group	Control Group	Source of Variance	Sum of Squares	DF	Mean Squares	'F' Ratio
Speed	Pre Test Mean	9.18	9.18	Between	.00	1	.00	5.85*
				Within	47.30	28	1.69	
	Post Test Mean	8.04	9.14	Between	8.10	1	8.10	
				Within	43.08	28	1.54	
	Adjusted Post Test Mean	8.04	9.14	Between	8.97	1	8.97	
				Within	1.23	27	.05	
Explosive Power	Pre Test Mean	1.88	1.81	Between	.04	1	.04	196.52*
				Within	4.17	28	.15	
	Post Test Mean	2.30	1.91	Between	1.16	1	1.16	
				Within	2.07	28	.07	
	Adjusted Post Test Mean	2.28	1.93	Between	.91	1	.91	
				Within	.64	27	.02	
Agility	Pre Test Mean	7.94	8.01	Between	.04	1	.04	9.77*
				Within	13.01	28	.47	
	Post Test Mean	7.12	7.95	Between	5.21	1	5.21	
				Within	14.92	28	.53	
	Adjusted Post Test Mean	7.14	7.93	Between	4.62	1	4.62	
				Within	9.59	27	.36	
Systolic Blood Pressure	Pre Test Mean	122.3	125.1	Between	58.80	1	58.80	12.96*
				Within	875.07	28	31.25	
	Post Test Mean	121.2	131.2	Between	750.00	1	750.00	
				Within	1620.80	28	57.89	
	Adjusted Post Test Mean	121.6	130.8	Between	585.52	1	585.52	
				Within	1535.88	27	56.88	
Diastolic Blood Pressure	Pre Test Mean	78.53	75.27	Between	80.03	1	80.03	7.09*
				Within	574.67	28	20.25	
	Post Test Mean	79.27	73.33	Between	264.03	1	264.03	
				Within	680.27	28	24.30	
	Adjusted Post Test Mean	78.82	73.78	Between	167.46	1	167.46	
				Within	637.63	27	23.62	

* Significance at 0.05 level of confidence for 1 and 28 (DF) =4.20, 1 and 27(DF) =4.21 *Significant

Table-2 shows that the pre-test mean scores of speed of ladder training group was 9.18seconds and control group was 9.18seconds. The post-test means showed differences due to six weeks varied ladder training and mean values recorded were 8.04 seconds and 9.14 seconds respectively. The obtained F-Value on pre-test scores .00 was less than the required F-Value of 4.20 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F-Value 5.85 was greater than the required F-Value of 4.20. This proved that the differences between the post-test means of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F-Value of 196.52 was greater than the required F-Value of 4.21. This proved that there were significant differences among the means due to six weeks varied ladder training on physical variable, speed. The pre-test mean scores of explosive power of ladder training group was 1.88 meters and control group was 1.81 meters. The post-test means showed differences due to six weeks varied ladder training and mean values recorded were 2.30 meters and 1.91 meters respectively.

The obtained F-Value on pre-test scores .28 was less than the required F-Value of 4.20 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F-Value 15.69 was greater than the required F-Value of 4.20. This proved that the differences between the post-test means of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F-Value of 38.50 was greater than the required F-Value of 4.21. This proved that there were significant differences among the means due to six weeks varied ladder training on physical variable, explosive power. The pre-test mean scores of agility of ladder training group was 7.94seconds and control group was 8.01seconds. The post-test means showed differences due to six weeks varied ladder training and mean values recorded were 7.12 seconds and 7.95 seconds respectively.

The obtained F-Value on pre-test scores .09 was less than the required F-Value of 4.20 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F-Value 9.77 was greater than the required F-Value of 4.20. This proved that the differences between the post-test means of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F-Value of 13.02 was greater than the required F-Value of 4.21. This proved that there were significant differences among the means due to six weeks varied ladder training on physical variable, agility. The pre-test mean scores of systolic blood pressure of ladder training group was 122.3Mm Hg and control group was 125.1 Mm Hg. The post-test means showed differences due to six weeks varied ladder training and mean values recorded were 121.2 Mm Hg and 131.2Mm Hg

respectively. The obtained F-Value on pre-test scores 1.88 was less than the required F-Value of 4.20 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F-Value 12.96 was greater than the required F-Value of 4.20. This proved that the differences between the post-test means of the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F-Value of 10.29 was greater than the required F-Value of 4.21. This proved that there were significant differences among the means due to six weeks varied ladder training on physiological variable, systolic blood pressure.

The pre-test mean scores of diastolic blood pressure of ladder training group was 78.53 Mm Hg and control group was 75.27 Mm Hg. The post-test means showed differences due to six weeks varied ladder training and mean values recorded were 79.27 Mm Hg and 73.33 Mm Hg respectively. The obtained F-Value on pre-test scores 3.90 was less than the required F-Value of 4.20 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups, as the obtained F-Value 10.87 was greater than the required F-Value of 4.20. This proved that the differences between the post-test means of the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F-Value of 7.09 was greater than the required F-Value of 4.21. This proved that there were significant differences among the means due to six weeks varied ladder training on physiological variable, diastolic blood pressure.

Conclusions

1. It was concluded that there was significant improvement in selected physical and physiological variables among school men athletes.
2. On testing the post-test means between experimental and control groups, significant mean difference was found on variables used in the study.
3. The study reveals that ladder training would improve the Speed, Explosive Power, Agility and Blood Pressure significantly at 0.05 level of confidence.

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