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Effect of ladder training and drop jump training on explosive power and coordination among inter collegiate Kabaddi players

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Abstract
The purpose of the study was formulated as a true random group design, consisting of a pre-test and post-test. The sixty men kabaddi players who represented their colleges in inter collegiate tournaments were randomly selected as subjects (N=60). The subjects were divided into three groups consisting of 20 in each group. The groups were assigned as Experimental Groups I, II, and group III. Experimental group I was given experiment ladder training, experimental group II was given drop jump training and the third one was considered as control group which did not underwent any special treatment. Pre-test was conducted for all sixty (N=60) subjects on selected performance variables such as, explosive power, and coordination. The experimental groups participated in their respective, training such as, ladder training and drop jump training for twelve weeks. The control group did not undergo any experimental training. Immediately after the experimental period post test was conducted on the above said dependent variables after a period of twelve weeks. The mean differences between the ladder training group and drop jump groups compared to control group were considered as the effect of respective experimental treatment. The pre and post test scores on selected criterion variables were tabulated and tested for statistical significance using ANACOVA. In all cases 0.05 level was fixed to test the hypothesis of this study.

Keywords: Ladder training, drop jump training and performance

Introduction

"Performance sports aim at high sports performance and for most physical and psychic capacities of sports men are developed to extreme limits. This normally does not happen in other areas of human activities. As a result, performance sports field possess valuable knowledge about the limits to which human performance and various performance factors can be developed. It also led to discovery of means and methods for improving various physical and psychic capacities (performance factors) to exceptionally high level. This knowledge can be faithful by applied to other areas of sports and human activities." "Improving skill means that the performance of any motor task becomes more efficient thereby reducing the time taken to complete the task and the level of effort required. This increased level of skillfulness could also mean more enjoyment and satisfaction for the performer by increasing the ease with which the task can be completed or by allowing new, more complex skills to be attempted.

Objectives of This Study

There are various training methods followed by players to improve their performance and performance related variables. Among the different methods, ladder training and drop jump training are found to be more effective in improving these variables. Hence, the investigator under took this study with the objective of assessing selected performance related physical fitness variables of kabaddi players. And the objectives of this study were:

1. To assess the intercollegiate level kabaddi players' performance related physical fitness variables, such as, explosive power and coordination.
2. To find out the effect of ladder training and drop jump training on selected performance physical fitness variables of the kabaddi players.
3. To assess any significant impact of the selected training methods on performance physical fitness variables of kabaddi players; and
4. To find whether any of the experimented training has any improvement over the other experimented training.

Statement of the Problem

The purpose of the study is to find out the effect of ladder training and drop jump training on explosive power and coordination among inter collegiate kabaddi players.

Hypothesis

It was hypothesized that there may be significant differences on the effect of ladder training on selected performance related physical fitness variables, explosive power and coordination among inter collegiate kabaddi players compared to control group.
It was hypothesized that there may be significant differences on the effect of drop jump training on selected performance related physical fitness variables, explosive power and coordination among inter collegiate kabaddi players compared to control group.
It was hypothesized that there may not be any significant differences on the effect of jump training on selected performance related physical fitness variables compared between ladder training and drop jump training among intercollegiate level kabaddi players.

Significance of The Study

- This study might helpful to explore the level of performance related physical fitness variables explosive power and coordination of kabaddi players.
- This study might explore the level of performances of intercollegiate kabaddi players on their performance physical fitness levels.

- This study might help the coaches and trainers to compare the players on the effect of ladder training and drop jump training on selected variables of kabaddi players.
- The results of this study would provide criteria for selecting the players on the basis of selected performance physical fitness levels of the players.
- The findings of this study would create interest among the kabaddi players and coaches to select suitable training for development of their performance related fitness variables.

Limitation
- Heredity and environment factors which will contribute to mental efficiency could not be controlled.
- The day to day activities and life style could not be controlled.
- The environmental factors at the time of responding to the experimental study would be attached the responses of the subjects which recognized as a limitation.

Delimitation
The study was delimited in terms of concerns and sample as follows
- Only intercollegiate level Kabaddi men players were be selected for the study.
- The age of the subjects were ranged from 19 to 25 years
- Only the following performance related fitness variables were selected for the study namely, agility, speed, explosive power, strength, flexibility, balance and coordination were selected for this study.

Definition of The Different Terms
- **Training**

Training has been explained as a program of exercise designed to improve the skills and increase the capacities of an athlete for particular event. (Singh, 1991).

- **Explosive Power**

"It is the capability of the individual to relax maximum force in the shortest period of time" (Mathews, 1981) [7].
Baungarther (1987) states "that the explosive power is the ability to relax maximum muscular force in the short test as in executing a standing jump."

- **Coordination**

It may be defined as the ability of the performance to integrate types of movements into specific patterns. (Yobu, 1987).

Co-ordination is operationally defined as the time taken to complete the obstacle race at the fastest possible time and was measured in the nearest one tenth of a second.

Methodology
Selection of subjects
The purpose of the study was to find out the effect of ladder training and drop jump training on selected performance related fitness variables among intercollegiate kabaddi players. To achieve the purpose of this study, sixty intercollegiate level kabaddi players from different colleges in Andhra Pradesh were selected. The selected subjects' age group was ranging from nineteen to twenty-five years. The subjects were randomly divided into three groups and each group consists of twenty subjects. Experimental group one underwent ladder training and experimental group two underwent drop jump training for twelve weeks, whereas the control group did not participate in any special training.

Selection of Variables
The investigator reviewed the available scientific literatures pertaining to the resistance training, sand training from books, journals, periodicals, magazines and research papers on performance fitness variables of kabaddi players. Based on the consideration of feasibility criteria, availability of instruments and the relevance of the variables to the present study, following variables were selected.

Dependent variables
Performance related fitness variables
1. Explosive power
2. Coordination

Independent Variables
1. Experimental Group I - Ladder Training for 12 weeks
2. Experimental Group II - Drop jump Training for 12 weeks

Experimental Design
The study was formulated as a true random group design, consisting of a pre-test and post-test. The sixty men kabaddi players who represented their colleges in inter collegiate tournaments were randomly selected as subjects (N=60). The subjects were divided into three groups consisting of 20 in each group. The groups were assigned as Experimental Groups I, II, and group V. Experimental group I was given experiment ladder training, experimental group II was given drop jump training and the third one was considered as control group which did not underwent any special treatment. Pre-test was conducted for all sixty (N=60) subjects on selected performance variables such as, explosive power and coordination. The experimental groups participated in their respective, training such as, ladder training and drop jump training for twelve weeks. The control group did not undergo any experimental training. Immediately after the experimental period post test was conducted on the above said dependent variables after a period of twelve weeks. The mean differences between the ladder training group and drop jump groups compared to control group were considered as the effect of respective experimental treatment. The pre and post test scores on selected criterion variables were tabulated and tested for statistical significance using ANACOVA. In all cases 0.05 level was fixed to test the hypothesis of this study.

Criterion Measures
The following criterion measures were adopted to measure the test.
1. Explosive power was measured using vertical jump test
2. Coordination was measured through Scott Motor Coordination Test

Ladder Drills Training
The experimental group underwent the following ladder drills training exercises:
1. Hop Scotch Drill
2. In-Out Drill
3. Lateral Feet Drill
4. Tango Drills
5. Five Count Drill

The description of the above five ladder drills are explained below

Table 1: Showing schedule of resistance training to experimental group I

S. No	Ladder Drills Training	I and IV Weeks		V & VIII Weeks		IX to XII Weeks	
		Repetitions	Sets	Repetitions	Sets	Sets	Sets
1	Hop Scotch Drill	4	2	4	3	4	4
2	In-out Drill	4	2	4	3	4	4
3	Lateral Feet Drill	4	2	4	3	4	4
4	Tango Drills	4	2	4	3	4	4
5	Five count Drills	4	2	4	3	4	4

Drop Jump Training

"The depth jump is a plyometric exercise that almost all athletes can benefit from. Main muscles involved in drop jump training are quadriceps (thigh), hamstrings, glutes (buttocks), calf muscles and joint motion: ankle extension, knee extension, hip extension.

Sports applicability of drop jump training are for running (sprinting, middle and long distances), all running and jumping based sports such as tennis, football, basketball, kabaddi and high jump etc.

Statistical Technique

To find out the effect of ladder drills training and drop jump training on selected performance related fitness variables among intercollegiate kabaddi players, the pre-test and post test scores were analysed by using ANCOVA statistical technique. When the F ratio was found to be significant, Scheffe's post hoc test was used to find out the paired mean significant difference. (Thirumalaisamy, 1998).

Results on Explosive Powerr

The statistical analysis comparing the initial and final means of performance related physical fitness variable, explosive power due to Ladder training and Drop jump training exercises among kabaddi players is presented in.

Table 2: Ancova results on effect of ladder training and drop jump training exercises compared with controls on explosive power

	Ladder training	Drop jump training	Control group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	54.80	53.80	52.60	Between	36.40	2	18.20	0.53
				Within	1940.45	57	34.04	
Post Test Mean	58.93	60.60	53.73	Between	585.90	2	292.95	7.50*
				Within	2227.75	57	39.08	
Adjusted Post Test Mean	59.47	61.42	55.05	Between	422.46	2	211.23	10.42*
				Within	1135.48	56	20.28	
Mean Diff	4.13	6.80	1.13					

Table F**:** Ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16
*Significant

As shown in Table 2, the obtained pre-test means on Explosive powerr on Ladder training group was 54.80, Drop jump training exercises group was 53.80 was and control group was 52.60. The obtained pre-test F value was 0.53 and the required table F value was 3.16, which proved that there was no significant difference among initial scores among the kabaddi players selected as subjects.

The obtained post test means on Explosive powerr on Ladder training group was 58.93, Drop jump training exercises group was 60.60 was and control group was 53.73. The obtained post test F value was 7.50 and the required table F value was 3.16, which proved that there was significant difference among post test scores of ladder training, drop jump training.

Taking into consideration of the pre-test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 10.42 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in.

Table 3: Multiple comparisons of paired adjusted means and scheffe's confidence interval test results on explosive power

MEANS				Required. C I
Ladder training Group	Drop jump training Group	Control Group	Mean Difference	
59.47	61.42		-1.95	3.60
59.47		55.05	4.42*	3.60
	61.42	55.05	6.37*	3.60

***** Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Ladder training group and control group (MD: 4.42). There was significant difference between Drop jump training exercises group and control group (MD: 6.37).

There was no significant difference between treatment groups, namely, Ladder training group and Drop jump training exercises group. (MD: -1.95). The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in.

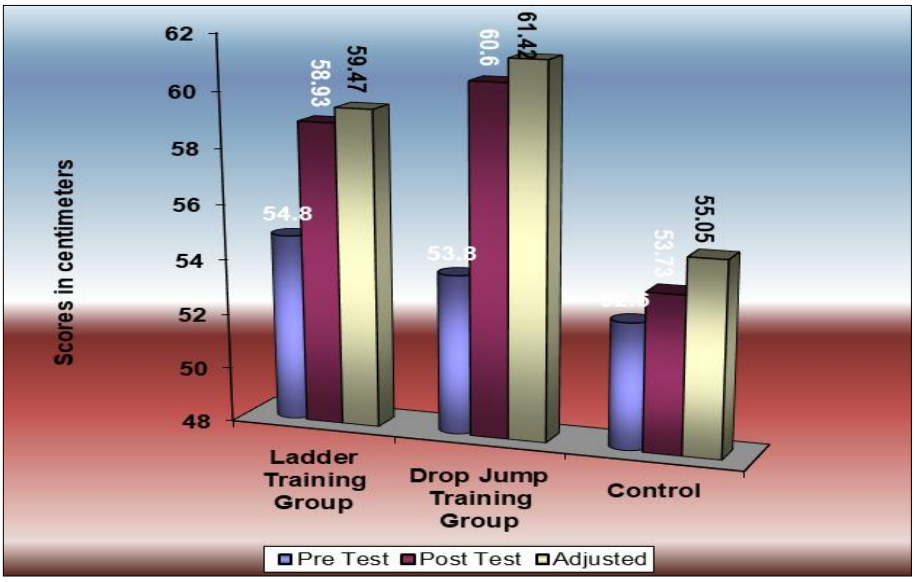

Fig 1: Bar Diagram Showing Pre-Test, Post Test and Ordered Adjusted Means on Explosive Power

Results on Coordination

The statistical analysis comparing the initial and final means of Coordination due to Ladder training and Drop jump training exercises among kabaddi players is presented in.

Table V: Ancova results on effect of ladder training and drop jump training exercises compared with controls on coordination

	Ladder training	Drop jump training	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
Pre-Test Mean	19.33	18.43	19.55	Between	9.57	2	4.79	2.62
				Within	104.04	57	1.83	
Post Test Mean	14.43	16.47	19.49	Between	228.15	2	114.08	54.42*
				Within	119.48	57	2.10	
Adjusted Post Test Mean	14.30	17.01	19.23	Between	242.60	2	121.30	117.18*
				Within	57.97	56	1.04	
Mean Diff	-4.90	-1.97	-0.06					

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.
*Significant

As shown in Table V the obtained pre-test means on Coordination on Ladder training group was 19.33, Drop jump training exercises group was 18.43 was and control group was 19.55. The obtained pre-test F value was 2.62 and the required table F value was 3.16, which proved that there was no significant difference among initial scores among the kabaddi players selected as subjects.

The obtained post test means on coordination on ladder training group was 14.43, drop jump training exercises group was 16.47 was and control group was 19.49. The obtained post test F value was 54.42 and the required table F value was 3.16, which proved that there was significant difference among post test scores of ladder training, drop jump training.

Taking into consideration of the pre-test means and post test means adjusted post test means were determined and analysis of covariance was done and the obtained F value 117.18 was greater than the required value of 3.16 and hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results were presented in.

Table VI: Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on Coordination

Means				Required. C I
Ladder training Group	Drop jump training Group	Control Group	Mean Difference	
14.30	17.01		-2.71*	0.81
14.30		19.23	-4.94*	0.81
	17.01	19.23	-2.23*	0.81

***** Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Ladder training group and control group (MD: -4.94). There was significant difference between Drop jump training exercises group and control group (MD: -2.23). There was significant difference between treatment groups, namely, Ladder training group and Drop jump training exercises group. (MD: -2.71). The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in.

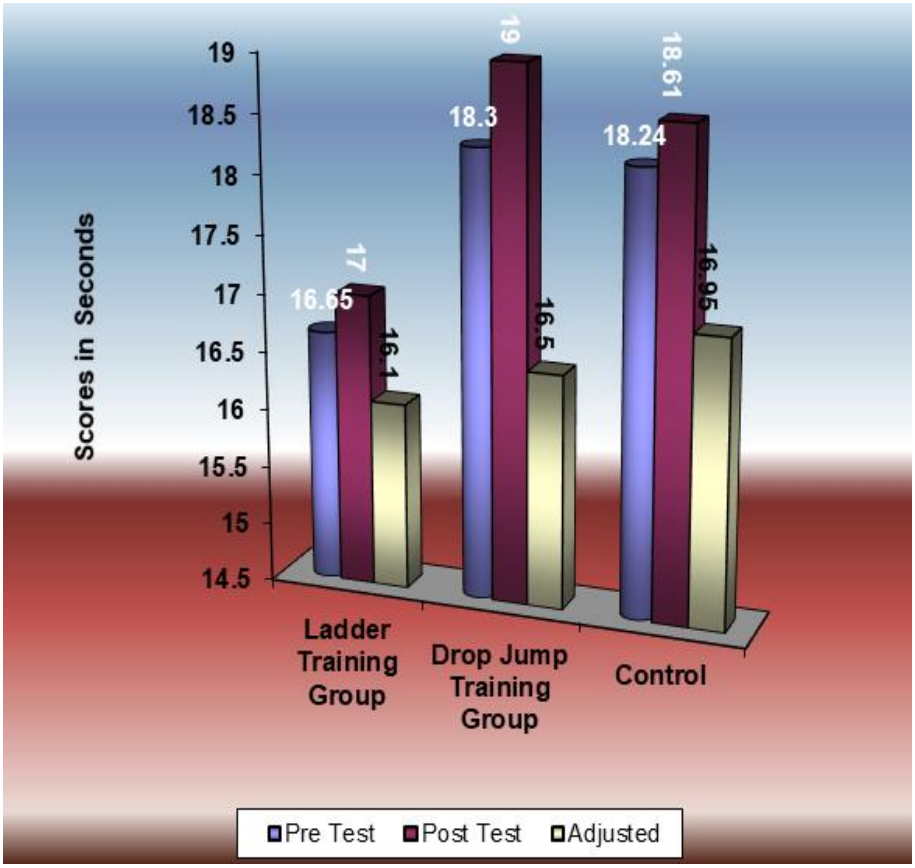

Fig 2: Bar diagram showing pre-test, post test and ordered adjusted means on coordination

Findings

Based on the results presented in the previous chapter, it was found that 12 weeks ladder training and 12 weeks drop jump training were significantly contributed for the improvement of selected performance related physical fitness variables explosive power and coordination of the intercollegiate level kabaddi players.

Conclusions

Based on the findings of the study, within the limitations and delimitations, the following conclusions were drawn.

1. The performance physical fitness variable, explosive power can be significantly improved through 12 weeks ladder training and 12 weeks drop jump training compared to control group of kabaddi players. It was also found that there was no significant difference between the experimental groups in altering explosive power.
2. The performance physical fitness variable, coordination can be significantly improved through 12 weeks ladder training and 12 weeks drop jump training compared to control group of kabaddi players. It was also found that drop jump training was significantly better than ladder training in altering coordination of kabaddi players.

Reference

1. Gofran Faroqi, "Kabadi". In Sirajul Islam, Ahmed A. Jamal.Banglapedia: National Encyclopedia of Bangladesh (Second ed.). Asiatic Society of Bangladesh, 2012.
2. Hardayal Singh, Sports Training General Theory Method Patiala: Netaji Subas National Institute of Sports, 1984, 148.
3. Harold M. Barrow *et al*, Practical Measurement in Physical Education sport, International Copy Right Union, USA, 1989, 9.
4. Ikesh Jahni, *et al*, Encyclopaedia of Sports,1996:6:334.
5. Kerr R, Psychomotor Learning, Philadelphia, Pa: Saunders Publishing, 1982.
6. Kulkarni VK. "Kabaddi is a game of struggle", 1960.
7. Mathews Donald K, Measurement in Physical Education, (3rd ed), Philadelphia W.B. Sounders Company, 1981, 22.
8. Mujumdar DC, Encyclopedia of Indian Physical Culture (Reopura Baroda: Good Campaigns, 1950), 92
9. Prasad Rao E, Modern Coaching in Kabaddi (New Delhi: D.V.S. Publications, 1994), 1.
10. Prasanna Rao E, Modern Coaching in Kabaddi, (New Delhi: D.V.S. Publishers, 1994), 96.
11. Rao CV, Kabaddi, NIS Publications 1983, 1.