



EFFECT OF HURDLES TRAINING ON EXPLOSIVE POWER, SPEED AND ELASTIC POWER AMONG KABADDI PLAYERS

Dr.M.SYED ALI

Director of Physical Education

Sadakathullah Appa College, Palayamkottai, Tirunelveli – 627002

Dr.P.MANIKANDAN

**Assistant Professor, Department of Physical Education, St.Johns College, Palayamkottai, Tirunelveli, Tamilnadu,
India-627002**

Abstract

The purpose of the study was to find out the effect of kabaddi training on explosive power, speed and elastic power among kabaddi players. To achieve the purpose of the study twenty male kabaddi players were randomly selected from Sadakathullah Appa College, Tirunelveli. All subjects were informed about the nature of the study and their consent was obtained to cooperate till the end of the experimental. Their age ranged from 18 to 21 years. The selection subject was divided into two group (N=10). The subject was under went exercise 10 minute warm up. All the subjects were fresh to hurdle training and their written voluntary consent was obtained after explaining the nature of the study. Subject underwent a medical check-up to ready-out that they free from any medical ailments and subject revealed that they were not consuming any drugs. The following dependent variables were selected for this study. Explosive power ,Speed, Elastic power, Independent Variables. The following independent variables were selected for this study. Hurdles training, the data collected from all the two groups were statistically analyzed. To find out the significant improvement between the pre and post means, dependent 't' test was used, to find out the significant difference on adjusted post test among the groups, analysis of covariance (ANCOVA) would used, From the analysis of the data, the following conclusions were drawn. The experimental group caused a significant improvement in explosive power. There was a significant improvement of speed in experimental group. The experimental group caused a significant improvement in elastic power

Key Words: Explosive Power, Speed and Elastic Power

INTRODUCTION

Kabaddi is a high-intensity team sport that requires players to perform repeated bouts of sprinting, rapid changes of direction, jumping, dodging, tackling, and explosive movements within a short period. Successful performance therefore depends on several physical qualities, particularly speed, explosive power, and the ability of the muscles and tendons to utilize stored elastic energy efficiently. During activities such as jumping, sudden acceleration, defensive movements, and attacking actions, players must produce high muscular force in a very short time. Hence, developing these physical qualities is an important component of systematic kabaddi training.

Hurdle training is a dynamic training method involving repeated jumping, hopping, and rapid movements over or between hurdles. It places emphasis on rapid force production, neuromuscular coordination, and the stretch-shortening cycle, in which an eccentric muscle action is rapidly followed by a concentric action. The stretch-shortening cycle allows elastic energy generated during the muscle-tendon stretching phase to contribute to subsequent force production. Research on kabaddi and hurdle-based exercises indicates that training involving this mechanism can improve explosive strength, sprint performance, jumping ability, and other components of athletic performance.

Explosive power refers to the ability to produce a large amount of force in a short period of time, whereas speed represents the ability to perform movement rapidly. Elastic power is closely associated with the efficient utilization of elastic energy during rapid stretch-shortening actions. These qualities are particularly relevant to kabaddi because players repeatedly accelerate, jump, land, change direction, and respond rapidly to opponents. Previous research has reported that kabaddi training can produce improvements in jumping and sprint performance, with systematic-review evidence showing positive effects following training periods of approximately four to twelve weeks. A six-week study using hurdle-box jumps also reported significant improvements in horizontal and vertical explosive power and agility among trained athletes.

Hurdle-based training may therefore provide a practical means of developing the rapid force-production and reactive movement abilities required in kabaddi. The combination of repeated jumping actions, controlled landing, rapid transition, and movement over obstacles can provide a training stimulus relevant to the physical demands of the sport. Recent evidence also indicates that training based on the stretch-shortening cycle can contribute to improvements in sprinting, power, and multidirectional movement abilities. Therefore, the present study is proposed to examine the effect of hurdle training on explosive power, speed, and elastic power among kabaddi players.

PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of hurdle training on explosive power, speed and elastic power among kabaddi players.

SELECTION OF SUBJECTS

To achieve the purpose of the study twenty male kabaddi players were randomly selected from Sadakathullah Appa College, Tirunelveli. All subjects were informed about the nature of the study and their consent was obtained to cooperate till the end of the experimental. Their age ranged from 18 to 21 years. The selection subject was divided into two group (N=10). The subject was underwent exercise 10 minute warm up. All the subjects were fresh to hurdle training and their written voluntary consent was obtained after explaining the nature of the study. Subject underwent a medical check-up to ready-out that they free from any medical ailments and subject revealed that they were not consuming any drugs.

SELECTION OF VARIABLES

Dependent variables

The following dependent variables were selected for this study.

Explosive power

Speed

Elastic power

Independent Variables

The following independent variables were selected for this study.

Hurdles training

Statistical Procedure

The pre and post test control group design will be used for this study.

Part I

The data collected from all the two groups were statistically analyzed. To find out the significant improvement between the pre and post means, dependent 't' test was used.

Part II

To find out the significant difference on adjusted post test among the groups, analysis of covariance (ANCOVA) would used.

In all case the criterion for statistical significance would set as 0.05 level of confidence.

Selection of Tests

Table I

TEST SELECTION

Sl.NO	Criterion Variables	Test	Unit of Measurement
1	Explosive power	Standing Vertical Jump	In Meter
2	Speed	50 mts run	In Seconds
3	Elastic power	5 hop jump	In Meter

ANALYSIS AND INTERPRETATIONS OF THE DATA

TABLE II
THE SUMMARY OF MEAN AND DEPENDENT 'T'-TEST FOR THE PRE AND POST TESTS ON
EXPLOSIVE POWER OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental group	Control group
Pre test Mean $\pm$ SD	0.41 $\pm$ 0.025	0.40 $\pm$ 0.023
Post test Mean $\pm$ SD	0.52 $\pm$ 0.045	0.41 $\pm$ 0.014
't' test	10.84*	0.36
Table value	2.26	2.26

*Significant at .05 level. The table value required for 0.05 level of significance with df 9 is 2.26

The table II shows that the pre-test mean value of experimental and control groups are 0.41, and 0.40 respectively and the post test means are 0.52 and 0.41 respectively. The obtained dependent t-ratio values between the pre and post test means of experimental and control groups are 10.84 and 0.36 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained 't' ratio value of experimental group is greater than the table value, it is understood that experimental group had significantly improved the explosive power. However, the control group has not improved significantly, the 'obtained t' value is less than the table value, as they were not subjected to any specific training.

TABLE III

ANALYSIS OF COVARIANCE (ANACOVA) ON EXPLOSIVE POWER OF EXPERIMENTAL AND CONTROL GROUPS

Adjusted Post-test Mean		Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Experimental group	Control Group					
0.51	0.41	Group	0.052	1	0.052	79.20*
		Error	0.011	17	0.0007	

*Significant at 0.05 level of confidence. The table value required for significance at 0.05 levels with df 1 and 17 is 4.45

Table III shows that the adjusted posttest means of experimental and control groups are 0.51 and 0.41 respectively. The obtained F-ratio value is 79.20, which is greater than the table value 4.45 with df 1 and 17

required for significance at 0.05 levels. Since the value of F-ratio is greater than the table value, it indicates that there is significant difference among the adjusted post-test means of experimental and control groups

TABLE IV

THE SUMMARY OF MEAN AND DEPENDENT 'T'-TEST FOR THE PRE AND POST TESTS ON SPEED OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental group	Control group
Pre test	8.75±	9.16±
Mean ± SD	0.45	0.47
Post test	8.37±	9.17±
Mean ± SD	0.40	0.44
't' test	6.41*	0.36
Table value	2.26	2.26

*Significant at .05 level. The table value required for 0.05 level of significance with df 9 is 2.26

The table IV shows that the pre-test mean value of experimental and control groups are 8.75, and 9.16 respectively and the post test means are 8.37 and 9.17 respectively. The obtained dependent t-ratio values between the pre and post test means of experimental and control groups are 6.41 and 0.36 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained 't' ratio value of experimental group is greater than the table value, it is understood that experimental group had significantly improved on speed. However, the control group has not improved significantly, the obtained 't' value is less than the table value, as they were not subjected to any specific training.

TABLE V

ANALYSIS OF COVARIANCE ON SPEED OF EXPERIMENTAL AND CONTROL GROUPS

Adjusted Post-test Mean		Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Experimental group	Control Group					
8.55	8.99	Group	0.81	1	0.81	43.29*
		Error	0.32	17	0.019	

*Significant at 0.05 level of confidence. The table value required for significance at 0.05 levels with df 1 and 27 is 4.45.

Table V shows that the adjusted posttest means of experimental and control groups are 8.55 and 8.99 respectively. The obtained F-ratio value is 43.29, which is greater than the table value 4.45 with df 1 and 17 required for

significance at 0.05 levels. Since the value of F-ratio is greater than the table value, it indicates that there was significant difference among the adjusted post-test means of experimental and control groups.

TABLE VI
THE SUMMARY OF MEAN AND DEPENDENT‘T’-TEST FOR THE PRE AND POST TESTS
ON ELASTIC POWER OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental group	Control group
Pre test	8.93±	8.63±
Mean ± SD	1.03	0.44
Post test	9.85±	8.63±
Mean ± SD	1.03	0.42
‘t’ test	9.52*	0.16
Table value	2.26	2.26

*Significant at .05 level. The table value required for 0.05 level of significance with df 9 is 2.26

The table VI shows that the pre-test mean value of experimental and control groups are 8.93, and 8.63 respectively and the post test means are 9.85 and 8.63 respectively. The obtained dependent t-ratio values between the pre and post test means of experimental and control groups are 9.52 and 0.16 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained‘t’ ratio value of experimental group is greater than the table value, it is understood that experimental group had significantly improved the elastic power. However, the control group has not improved significantly, the obtained‘t’ value is less than the table value, as they were not subjected to any specific training.

TABLE VII
ANALYSIS OF COVARIANCE ON ELASTIC POWER OF
EXPERIMENTAL AND CONTROL GROUPS

Adjusted Post-test Mean		Sources of Variance	Sum of Square	df	Mean Squares	F-ratio
Experimental group	Control Group					
9.71	8.76	Group	4.16	1	4.16	71.95*
		Error	0.98	17	0.058	

*Significant at 0.05 level of confidence. The table value required for significance at 0.05 levels with df 1 and 17 is 4.45

Table VII shows that the adjusted post test means of experimental and control groups are 9.71 and 8.76 respectively. The obtained F-ratio value is 71.95, which is greater than the table value 4.45 with df 1 and 17 required for significance at 0.05 levels. Since the value of F-ratio is greater than the table value, it indicates that there is significant difference among the adjusted post-test means of experimental and control groups.

Conclusions

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

1. The experimental group caused a significant improvement in explosive power.
2. There was a significant improvement of speed in experimental group.
3. The experimental group caused a significant improvement in elastic power.

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