STAR
Research Journal

Available online at www.starresearchjournal.com (Star International Journal)

PHYSICAL EDUCATION

Star. Phy. Edn. 05 (2013)

EFFECT OF CONCURRENT STRENGTH AND SPEED TRAINING ON EXPLOSIVE POWER SPEED AND STRENGTH AMONG INTER COLLEGIATE KABADDI PLAYERS

[*] Dr. A.S. Nageswaran

ABSTRACT

The purpose of the study was to find out the effect of concurrent strength and speed training on explosive power, speed and strength among intercollegiate Kabaddi players. Twenty four male inter collegiate Kabaddi players from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur were selected randomly as subjects. The age of the subjects ranged from 21 to 28 years. The selected subjects were divided into two groups. Group I underwent concurrent speed and strength training and Group II acted as control. The experimental group was subjected to the concurrent speed and strength training for alternative three days per week up to six weeks. The concurrent speed and strength training was selected as independent variable and the criterion variables explosive power, speed and strength were selected as dependent variables and the selected dependent variables were assessed by the standardized test items. Explosive power was assessed by vertical jump test and the unit of measurement in centimeters, speed was assessed by 50m run and the unit of measurement in seconds and strength was assessed by 1 RM test and the unit of measurement in kg. The experimental design selected for this study was pre and post test randomized design. The data were collected from each subject before and after the training period and statistically analyzed by using dependent 't' test and analysis of covariance (ANCOVA). It was found that there was a significant improvement and significant different exist due to the effect of concurrent speed and strength training on explosive power, speed and strength among college students when compared to control group.

[*] Associate Professor, Department of Physical Education and Centre for Research, H. H. The Rajah's College, Pudukkottai

INTRODUCTION

Most of the competitive sports require the athletes to run at very high or maximum speed, and it is believed that such ability is crucial for individual and team performance. Literature reveals that running speed can be improved with over – speed training, and sprint training without external resistance (Delecluse, 1997; Delecluse et.al., 1995). In this context, explosive type strength training is more effective with concurrent speed training (Mc Bride et.al., 2002). Specifically, either neural adaptations or a learning transfer occur during explosive – type strength exercises which consist of fast movement, and subsequently improve running speed (McBride et.al., 2002). Contrary to explosive – type strength training, slow – speed strength training does not include similar effects since during this training the nervous system cannot learn and control the acquired level of strength in very fast movement (Kotzamanidid et.al., 2005). Thus slow-speed strength training does not significantly contribute to running speed that requires a high level of inter-limb coordination (Mero et.al., 1992).

Previous studies have combined muscular strength training with speed training to simultaneously improve athlete's body strength and running speed at sport-specific distance (Kotzamanidis et.al., 2005; Wong et.al., 2009) Kotzamanidis et.al., 2005 concurrently implemented muscular strength training and speed training twice per week. In this programe, strength training exercise, consisted of back half squate, single leg setups, and leg curl, were performed for 3 – 8 RM for 4 sets with 3 minutes rest between sets. Ten minutes after the strength programe, the 30 meter speed training was performed for 4 – 6 repetitions with 3 minutes rest in between. In another study, Wong et.al., (2009) conducted strength training in the morning session and high intensity running in the afternoon session, twice per week for 8 weeks. Strength training programe consisted of high-pull, jump squate, bench press, and back half squate, at 6 RM for 4 sets with 3 minutes rest between sets. It is believed that such strength program maximize strength gains by neural adaptation (Baechle et. al., 2000), and induce minor muscular hypertrophy which favor most of the well trained athletes since they do not need to move with a heavier body (Hakkinen & Komi, 1985; Kyrolainen et.al., 2005). In addition, the high intensity running interval used by Wong et.al (2009) consisted of 12 – 15 running for 15 seconds (1:1 work rest ratio) at individualized (120% of maximum aerobic speed).

Kotzamanidis et.al., (2005) showed that after a 9 week concurrent muscular strength and speed training, significant improvement in sports specific fitness such as 30 meter sprint, squat jump, and drop jump were observed in the concurrent training group, while no significant difference were reported in the strength training group and control group. Additionally, both concurrent training group and strength training group reported significant improvement in muscular strength such as half squat, single leg step up, and leg curl. Furthermore, it has been showed that after 8 weeks of concurrent strength and high intensity running interval training, muscular strength, jumping ability, 10 meter and 30 meter sprints, intermittent aerobic capacity were significantly improved in professional athletes, as compared to the control group with sport training alone (Wong et.al., 2009).

METHODOLOGY

To achieve the purpose, twenty four men inter collegiate Kabaddi players studying from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur were selected randomly as subjects. The age of the subjects ranged from 21 to 28 years. They were assigned randomly into two groups (group I) underwent concurrent strength and speed training and (group II) acted as control of twelve subjects each. The experimental group was subjected to the training during morning hours for alternative three days for six weeks and group II acted as control. The concurrent strength and speed training was selected as independent variable and the criterion variables explosive power, strength and speed were selected as dependent variables and the selected dependent variable were assessed by the standardized test items. Explosive power was assessed by vertical jump test and the unit of measurement in centimeters, strength was assessed by 1 RM test and the unit of measurement in kgs and speed was assessed by 50m run and the unit of measurement in seconds. The experimental design selected for this study was pre and post test randomized design. The data were collected from each subject before and after the training period and statistically analyzed by using dependent ‘t’ test and analysis of covariance (ANCOVA).

RESULTS AND DISCUSSIONS

The data pertaining to the variables in this study were examined by using dependent ‘t’ test to find out the significant improvement and analysis of covariance

(ANCOVA) for each variables separately in order to determine the difference and tested at .05 level of significance. The analysis of dependent 't' test on data obtained for explosive power, strength and speed of the pre test and post test means of experimental and control group have been analyzed and presented in Table I.

TABLE- I
MEAN AND DEPENDENT 't' TEST OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Mean	Concurrent Strength and Speed Training	Control Group
Explosive Power	Pre test Mean	1.74	1.74
	Post test Mean	1.75	1.73
	't' test	**13.00***	**1.483**
Strength	Pre test Mean	75.42	74.67
	Post test Mean	76.25	74.50
	't' test	**11.73***	**1.48**
Speed	Pre test Mean	7.13	7.07
	Post test Mean	7.04	7.08
	"t" test	**11.00***	**1.483**

*Significant at 0.05 level of confidence (11) = 2.201

The obtained 't' ratio value of experimental group is higher than the table value, it is understood that concurrent strength and speed training had significantly improved the performance of explosive power, strength and speed. However, the control group has no significant improvement as the obtained 't' value is less than the table value; because it was not subjected to any specific training. The analysis of covariance on the data obtained on explosive power, strength and speed due to the effect of concurrent strength and speed training and control groups have been analysed and presented in Table II.

TABLE- II

ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Adjusted Post Test Means		Source of Variance	SS	df	Mean Squares	'F'-Ratio
	Concurrent Strength and Speed Training	Control Group					
Explosive Power	1.75	1.74	Between	9.392	1	9.392	78.04*
			Within	2.53	21	0.120	
Strength	75.88	74.87	Between	6.027	1	6.027	54.91*
			Within	2.305	21	0.110	
Speed	7.01	7.12	Between	0.068	1	0.068	55.31*
			Within	0.026	21	0.001	

*Significant at .05 level of confidence, df (1, 21) = 4.32

Table II shows that the obtained 'F' ratio value are 78.04, 54.91, 55.31 and which are higher than the table value 4.32 with df 1 and 21 required to be significant at 0.05 level. Since the obtained value of 'F' ratio is higher than the table value, it indicates that there is significant difference among the adjusted post- test means of concurrent strength and speed training and control group on explosive power, strength and speed.

To the most sports people, concurrent strength and speed training offered a better method of developing explosive power, strength and speed. The present study also produced the same result.

CONCLUSIONS

1. The concurrent strength and speed training had significantly improved the explosive power, strength and speed.
2. There was significant difference among the adjusted post – test means of concurrent strength and speed training and control group on explosive power, strength and speed.

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