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Contact of various medicine ball training and resistance training on leg strength and leg explosive power of throwers

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Abstract

This study was totally (N=80) eighty throwers were selected as samples from the qualified athletes in Bharathiar University Inter-Collegiate athletic meet were selected. They were outstanding and average throwers (Shot put, Discus throw, Javelin, Hammer throw) in the Inter-Collegiate athletic meet, Bharathiar University, Coimbatore district, Tamil Nadu, India. The selected subjects eighty (N=80) were divided into four equal groups. Each group consists of 20 subjects. The Experimental group – I was underwent to Medicine Ball Training (MBT), Experimental group – II was underwent to Resistance Training Group (RTG), Experimental group – III was underwent to Combination of Medicine Ball and Resistance Training (CMBARTG) and group – IV acted as Control Group (CG). The ages of subjects were ranged from 19 to 25 years. The tests on selected criterion (leg strength and leg explosive power) variables were taken and recorded for all the four groups. Therefore, the 'F' ratio was found to be significant for adjusted post-test means, Scheffe's post hoc test was used to determine which of the paired mean difference was significant.

Keywords: Medicine ball training, resistance training, inter-collegiate athletes

Introduction

Athletics is often used synonymously with any sporting activity, but in most cases, athletics refers primarily to track-and-field events that involve running, jumping or throwing. Those athletic events are most closely associated with the Olympics, but competition in these sports is held at the youth level, high school, college, and professional ranks all year round throughout the world. The first Olympics in ancient Greece go back at least as far as the eighth or ninth century B.C. While such sports as boxing and equestrian events were included, most of the events were those now classified under athletics or track and field. They included running, jumping, discus and the javelin. Those four, plus wrestling, made up the pentathlon. The running events included "stades," which were essentially sprints from one end of the stadium to the other, a distances of about 190 meters; two-stade races; longer-distance races of between seven and 24 stades; and a two- or four-stade race in which the competitors wore armor. Running and other athletic events have long been a part of many cultures, but in the 19th century, such activities were becoming more popular, particularly in Europe and the United States. School curricula included athletics and in 1896, the first Modern Olympics were held in Athens, Greece. Events included the 100-meters, 400 meters, 800 meters, 1,500 meters, 110-meter hurdles, pole vault, discus, shot put, javelin, long jump, triple jump and high jump. Fourteen nations were represented.

Athletics is a collection of sporting events that involve competitive running, jumping, throwing, and walking. The most common types of athletics competitions are track and field, road running, cross country running, and race walking. The results of racing events are decided by finishing position (or time, where measured), while the jumps and throws are won by the athlete that achieves the highest or furthest measurement from a series of attempts. The simplicity of the competitions, and the lack of a need for expensive equipment, makes athletics one of the most commonly competed sports in the world. Athletics is mostly an individual sport, with the exception of relay races and competitions which combine athletes' performances for a team score, such as cross country.

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Organized athletics are traced back to the Ancient Olympic Games from 776 BCE. The rules and format of the modern events in athletics were defined in Western Europe and North America in the 19th and early 20th century, and were then spread to other parts of the world. Most modern top level meetings are conducted by the International Association of Athletics Federations and its member federations. The athletics meeting forms the backbone of the Summer Olympics (wiki, 2015).

Methods

This study, (N=80) eighty throwers (shot put, discuss, javelin, Hammer throw) were selected as samples from the qualified athletes in Bharathiar University Inter-Collegiate athletic meet were selected. They were outstanding and average throwers (Shot put, Discus throw, Javelin, Hammer throw) in the inter-collegiate athletic meet, Bharathiar University, Coimbatore district, Tamil Nadu, India. The selected subjects eighty (N=80) were divided into four equal groups. Each group consists of 20 subjects. The Experimental group – I was

underwent to Medicine Ball Training (MBT), Experimental group – II was underwent to Resistance Training Group (RTG), Experimental group – III was underwent to Combination of Medicine Ball and Resistance Training (CMBARTG) and group – IV acted as Control Group (CG). The ages of subjects were ranged from 19 to 25 years. The tests on selected criterion (leg strength - wall sit test-measured in seconds and leg explosive power- standing broad jump measured in meters) variables were taken and recorded for all the four groups. All the three experimental groups were trained for three days per week for a period of 12 weeks. The data collected from the four groups and statistically analyzed to determine the significant difference, if any, applying t-ratio, analysis of covariance (ANCOVA). Eighty subjects were divided at random and assigned into four groups of twenty each. No attempt was made to equate the groups in any manner.

Results and Findings of this study

Table 1: Analysis of covariance of MBT, RTG, CMBARTG and CG on leg strength (In seconds)

	MBT Mean	RTG Mean	Cmbartg Mean	CG Mean	Source of variance	Sum of squares	df	Mean square	F-value
Pre-test	49.91	51.61	51.25	53.26	BG	117.400	3	39.133	1.16
					WG	2561.80	46	33.708	
Post-test	54.01	55.63	55.82	53.11	BG	411.438	3	137.146	4.29
					WG	2429.050	76	31.961	
Adjusted Mean	51.65	55.35	55.67	51.67	BG	310.485	3	103.495	33.89
					WG	228.975	75	3.053	

*significant level 0.05 level (3.22)

Table- 1 shows F ratio of 1.16 on leg strength is lesser than the required table value of 2.72, it is found to be insignificant at 0.05 level of confidence for 3 and 76 degrees of freedom. The post- F ratio of 4.29 on leg strength is higher than the required table value of 2.72, it is found to be significant at 0.05 level of confidence for 3 and 76 degrees of freedom.

Since the obtained Adjusted Mean F ratio of 33.89 on leg strength is higher than the required table value of 2.72, it is found to be significant at 0.05 level of confidence for 3 and 76 degrees of freedom. To determine which of the paired means had a significant difference, the Scheffe’s test was used as a post-hoc test and the results are presented in table- 2.

Table 2: Scheffe’s test for the difference between the adjusted post-test mean on leg strength (In seconds)

MBT Mean	RTG Mean	CMBARTG Mean	CG Mean	M.D	C.I
51.65	55.35	-	-	-3.7	3.53
51.65	-	55.67	-	-4.02	3.53
51.65	-	-	51.67	-0.02	3.53
-	55.35	55.67	-	-0.32	3.53
-	55.35	-	51.67	3.68	3.53
-	-	55.67	51.67	4.00	3.53

Table- 2 illustrate that it may be concluded from the results of the study, that there is higher significant differences between the adjusted post-test means of medicine ball training group

(MBT) and combination of medicine ball and resistance training (CMBARTG) on leg strength.

Table 3: Analysis of covariance of MBT, RTG, CMBARTG and CG on leg explosive power (In meters)

	MBT Mean	RTG Mean	Cmbartg Mean	CG Mean	Source of variance	Sum of squares	df	Mean square	F-value
Pre-test	2.23	2.16	2.10	1.97	BG	0.835	3	0.278	1.95
					WG	10.802	46	0.142	
Post-test	2.43	2.22	2.18	1.98	BG	2.224	3	0.741	4.79
					WG	11.745	76	0.155	
Adjusted Mean	2.31	2.17	2.20	2.12	BG	0.360	3	0.120	9.55
					WG	0.942	75	0.013	

*significant level 0.05 level (3.22)

Table- 1 shows F ratio of 1.95 leg explosive power is lesser than the required table value of 2.72, it is found to be

insignificant at 0.05 level of confidence for 3 and 76 degrees of freedom. The post- F ratio of 4.79 on leg explosive power

is higher than the required table value of 2.72, it is found to be significant at 0.05 level of confidence for 3 and 76 degrees of freedom. Since the obtained Adjusted Mean F ratio of 9.55 on leg explosive power is higher than the required table value of 2.72, it is found to be significant at 0.05 level of confidence

for 3 and 76 degrees of freedom. To determine which of the paired means had a significant difference, the Scheffe's test was used as a post-hoc test and the results are presented in table- 4.

Table 4: Scheffe's test for the difference between the adjusted post-test mean leg explosive Power (In meters)

MBT Mean	RTG Mean	CMBARTG Mean	CG Mean	M.D	C.I
2.31	2.17	-	-	0.14	0.13
2.31	-	2.20	-	0.11	0.13
2.31	-	-	2.12	0.19	0.13
-	2.17	2.20	-	-0.03	0.13
-	2.17	-	2.12	0.05	0.13
-	-	2.20	2.12	0.08	0.13

Table- 4 illustrate that it may be concluded from the results of the study, that there is higher significant differences between the adjusted post-test means of medicine ball training group (MBT) and resistance training group (RTG) on leg explosive power.

Conclusions

1. The results of comparative effects lead to concluded that combination of medicine ball and resistance training (CMBARTG) has higher significant improvement on leg strength of inter collegiate male throwers as compared to their performance with either medicine ball training group (MBT) or Resistance training (RTG) alone.
2. The results of comparative effects lead to concluded that Combination of medicine ball training group (MBT) has significant improvement on leg explosive power of inter collegiate male throwers as compared to their performance with either combination of medicine ball and resistance training (CMBARTG) or Resistance training (RTG) alone.

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