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ORIGINAL ARTICLE

COMPARATIVE EFFECTS OF PLYOMETRIC, CIRCUIT TRAINING AND CIRCUIT BREAKER PROGRAMMES ON SELECTED MOTOR COMPONENTS OF SCHOOL LEVEL BASKETBALL PLAYERS.

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Abstract:

The purpose of the study was to compare the effects of plyometrics, circuit training and circuit breaker programmes on selected motor components of school level basketball players. For the purpose of the study; four groups: three experimental groups viz: plyometrics training group (A), circuit training group (B), and circuit breaker programme group (C) and the fourth group served as the control group. Random group design was employed. Reliability coefficients for the test- re- test scores on selected motor components: leg power (standing broad jump) 0.99, shoulder and arm power (two hand medicine ball put test) 0.98, muscular endurance (burpee test) 0.99, speed (50 yards dash) 0.98, and agility(right boomerang run) 0.97 were selected to collect the data.

To find out the comparative effects of plyometric training, circuit training and circuit breaker programme on selected motor components of school level Basketball players, analysis of covariance was employed, the proposed hypothesis was tested at .05 level of confidence. The result revealed significant improvement in most of the selected motor components. All the three experimental groups were effective in improving the explosive strength of the subjects (leg power, shoulder and arm power). The plyometric and circuit breaker programme groups were comparatively better than the circuit training group in improving the leg power and arm and shoulder power of the subjects.

KEYWORDS:

Plyometrics, Circuit Training, Circuit Breaker.

INTRODUCTION:

Now-a-days specific training has been playing a predominant role with emergence of different methods having sustained scientific knowledge for outstanding achievements in various levels of competition. The sportsman is able to achieve a high level of performance by concentrating on major areas like physical power, physiological efficiencies, psychological development, application of biomechanics and environment adjustments.

Any activity that activates the stretch reflex mechanism is plyometric exercise. Plyometric exercise is based upon the belief that a rapid lengthening of a muscle just prior to the contraction will result in much stronger contraction.

Circuit training is based on the premise that the athlete must do the same amount of work in a shorter period of time or must do considerably more work within the limits of an assigned training period.

Circuit breaker programme is a combination of plyometrics and circuit training.

Basketball is an excellent sport for developing and maintaining physical fitness. It also presents a

real challenge to its participants. It provides them with a wonderful opportunity to develop strength, endurance, agility, coordination and other physiological benefits.

METHOD

Eighty male school level basketball players of Gorakhpur (Uttar Pradesh) were randomly selected as the subjects for the study. The age of the subject's ranged between 13-18 years.

Four groups: three experimental groups viz: plyometrics training group (A), circuit training group (B), and circuit breaker programme group (C) and the fourth group served as the control group. Random group design was employed. Three experimental groups under went the experimental training programme for 12 weeks, thrice a week on alternate days. Reliability coefficients for the test- re- test scores on selected motor components: leg power (standing broad jump) 0.99, shoulder and arm power (two hand medicine ball put test) 0.98, muscular endurance (burpee test) 0.99, speed (50 yards dash) 0.98, and agility(right boomerang run) 0.97 were selected to collect the data.

In order to find out the comparative effects of circuit training, plyometric training and circuit breaker programme on selected motor components of school level Basketball players, analysis of covariance was employed, the proposed hypothesis was tested at .05 level of confidence.

FINDINGS

TABLE – 1
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS AMONG THE EXPERIMENTAL GROUPS AND CONTROL GROUP IN STANDING BROAD JUMP PERFORMANCE

	Group Means				
Plyometric	Circuit Training	Circuit Breaker	Control	Mean Difference	Critical Difference
1.72	1.71			0.01	0.02
1.72		1.72		0.00	0.02
1.72			1.62	0.10*	0.02
	1.71	1.72		0.01	0.02
	1.71		1.62	0.10*	0.02
		1.72	1.62	0.10	0.02

* indicates significant difference

The analysis of data in table-1 indicates significant differences for all the three experimental groups when compared with the control group. However, the differences among any of the experiment groups are not significant as the mean difference values are lesser than the critical difference value of 0.02 required for significance.

TABLE – 2
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS AMONG THE EXPERIMENTAL GROUPS AND CONTROL GROUP IN MEDICINE BALL PUT PERFORMANCE

	Group Means				
Plyometric	Circuit Training	Circuit Breaker	Control	Mean Difference	Critical Difference
5.26	4.86			0.40*	0.19
5.26		5.09		0.17	0.19
5.26			4.43	0.83*	0.19
	4.86	5.09		0.23*	0.19
	4.86		4.43	0.43*	0.19
		5.09	4.43	0.66*	0.19

* indicates significant difference

The analysis of data in table-2 shows that the paired adjusted final means of plyometric group is greater than of other groups there by indicates that plyometric training is most effectives than other two training programme to develop shoulder and arm power. No significant difference is found between plyometric and circuit breaker programme.

TABLE – 3
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS AMONG THE EXPERIMENTAL GROUPS AND CONTROL GROUP IN BURPEE TEST PERFORMANCE

	Group Means				
Plyometric	Circuit Training	Circuit Breaker	Control	Mean Difference	Critical Difference
75.01	74.56			0.45	2.39
75.01		73.94		1.07	2.39
75.01			69.24	5.77*	2.39
	74.56	73.94		0.62	2.39
	74.56		69.24	5.32*	2.39
		73.94	69.24	4.70*	2.39

* indicates significant difference

The analysis of data in table-3 indicates significant differences of 5.77, 5.32 and 4.70 respectively for the plyometric, circuit training and circuit breaker programme group with that of the control group. The mean differences among any of the experimental groups are not significant as are lesser than the critical difference value of 2.39 required for significance.

TABLE – 4
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS AMONG THE EXPERIMENTAL GROUPS AND CONTROL GROUP IN 50-YARD DASH PERFORMANCE

	Group Means				
Plyometric	Circuit Training	Circuit Breaker	Control	Mean Difference	Critical Difference
7.24	7.22			0.02	0.38
7.24		7.20		0.04	0.38
7.24			7.63	0.39*	0.38
	7.22	7.20		0.02	0.38
	7.22		7.63	0.41*	0.38
		7.20	7.63	0.43*	0.38

* indicates significant difference

The analysis of data in table-4 indicates significant differences of 0.39, 0.41 and 0.43 respectively for the plyometric, circuit training and circuit breaker programme group with that of the control group. The mean differences among the three experiment groups are not significant as are lesser than the critical difference value of 0.38 required for significance.

TABLE – 5
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS AMONG THE EXPERIMENTAL GROUPS AND CONTROL GROUP IN RIGHT BOOMERANG RUN PERFORMANCE

	Group Means				
Plyometric	Circuit Training	Circuit Breaker	Control	Mean Difference	Critical Difference
12.09	11.46			0.63	0.85
12.09		11.83		0.26	0.85
12.09			13.47	1.38*	0.85
	11.46	11.83		0.37	0.85
	11.46		13.47	2.01*	0.85
		11.83	13.47	1.64*	0.85

* indicates significant difference

The analysis of data in table-5 indicates significant differences of 1.38, 2.01 and 1.64 respectively for the plyometric, circuit training and circuit breaker programme group with that of the control group. The mean differences among the three experimental groups are not significant as are lesser than the critical difference value of 0.85 required for significance.

DISCUSSIONS OF FINDINGS

The result revealed significant improvement in most of the selected motor components. All the three experimental groups were effective in improving the explosive strength of the subjects (leg power, shoulder and arm power). The plyometric and circuit breaker programme groups were comparatively better than the circuit training group in improving the leg power and arm and shoulder power of the subjects. The increase in the muscle force as evident from the improvement of leg power and shoulder and arm power of the subject may be attributed to two inherent properties of the muscle tissue. A muscle possibly stretched prior to a contraction utilizes the stretch reflex to activate the muscle to shorten vigorously, and the elastic nature of the muscle fibers allows the muscle to store energy during negative work or the phase of amortization, to be later released during the overcoming phase or shortening contraction

All the three experimental groups significantly improved the muscular endurance of the subjects. This may be due to the fact that the load which was experienced by the subjects in these three training programmes was adequate to produce significant improvement in muscular endurance. No significant improvement incase of the control group may be due to their nonparticipation in the training programme contributing to development of muscular endurance.

In the case of speed performance and agility the changes from pre to post suggest that all the three experimental training programmes were effective in improving speed and agility. Probably the reason was the involvement of the same group of muscles in these three training programmes.

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