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Effect of Different Training Methods on Selected Motor Fitness Variables of College Level Basketball Players

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Abstract: ***The purpose of this study was to know the effect of different training methods on selected motor fitness variables of college level basketball players.***
One hundred twenty college level basketball players age ranging between 19 to 22 years acted as subjects and assigned to four groups (three experimental and one control group) with 30 students each. The three experimental groups were Circuit Training, Plyometric Training and Interval Training groups.
Motor fitness variables such as Abdominal Muscle Strength (Sit Up), Flexibility (Sit and Reach) and Cardiovascular Endurance were measured before and after training. All the experimental Groups (Circuit training, Plyometric training and Interval training) was administered with the selected training programme, thrice in a week for a duration of 6 weeks under direct supervision of the researcher.
The analysis of data revealed that the three experimental groups, showed significant gains in performance of selected motor fitness variables after administration of training for duration of 6 weeks. The control group did not show any significant increase in the performance.
Keywords: ***Circuit Training, Plyometric Training, Interval Training, Motor fitness variables.***

I. INTRODUCTION

A fit body is an asset to any game. The present era stresses upon sports and games involving high skill and expertise. Super performances not only depends upon skill and expertise but also requires a high degree of physical fitness of the players. Thus, fitness is the key factor and base of the super performances.
Preparing a skilled player depends upon the provision of type of training to the player. Sports training refer to specialized strategies and methods of exercise used in various sports to develop players and athletes and prepare them for performing in sporting events. *The purpose of this study was to know effect of different training methods on selected motor fitness variables of college level Basketball players*

II. METHODOLOGY

One hundred twenty college level basketball players, age ranging between 19 to 22 years acted as subjects and were randomly assigned to four groups i.e., three experimental groups and one control group, consisting of 30 students each. The experimental treatments were also assigned to the groups at random.
The Experimental Groups (three groups) were given Circuit Training, Plyometric Training and Interval Training respectively. The control group being kept away from the training schedule and continued in performing normal college programme. Keeping the feasibility criterion in mind, especially in the case of availability of instruments, the following variables of motor fitness were chosen: 1. Muscle Strength (Sit Up), 2. Flexibility (Sit and Reach) and 3. Cardiovascular Endurance (1 Mile Run), All the experimental Groups (Circuit training, Plyometric training and Interval training) were administered with the selected exercises, thrice in a week for a duration of 6 weeks under direct supervision of the researcher.

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III. FINDINGS

The statistical analysis of data on motor fitness components of subjects belonging to three experimental groups and one control group, each comprising of thirty subjects, is presented below.

TABLE – 1(Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in Sit Ups)

Groups	Pre-test mean±SE	Post-test mean±SE	Diff. between means	SE	't' ratio
Circuit training	24.667±0.830	26.867±0.803	2.200	0.443	4.965*
Plyometric training	24.767±0.756	28.567±0.474	3.800	0.416	9.127*
Interval training	24.967±0.968	25.967±0.828	1.000	0.418	2.392*
Control	24.633±0.977	24.367±0.796	0.266	0.258	1.034

* Significant at 0.05 level of confidence, 't' $_{0.05}$ (29) = 2.045. Table 1 clearly reveals that all the experimental groups improved significantly yielding 't' value of 4.965, 9.127 and 2.392 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit ups performance of subjects indicating 't' values of 1.034. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045.

TABLE – 2 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in Sit Ups)

	Circuit training	Plyometric training	Interval training	Control	Sum of squares	df	Mean square	F ratio
Pre-test means	24.667±0.830	24.767 ±0.756	24.967± 0.968	24.633 ±0.977	B 2.025 W 2741.967	3 116	0.675 23.638	0.029
Post-test means	26.867±0.803	28.567 ±0.474	25.967± 0.828	24.367 ±0.796	B 276.825 W 1904.767	3 116	92.275 16.420	5.620*
Adjusted post-test means	26.935±0.323	28.560 ±0.323	25.810± 0.323	24.460 ±0.323	B 271.697 W 360.672	3 115	90.566 3.136	28.877 *

* Significant at 0.05 level of confidence, N = 120, B = Between group variance, W = Within group variance. The analysis of covariance for sit ups showed that the resultant 'F' ratio of 0.029 was not significant in case of pre test means. The post test means yielded 'F' ratio of 5.620, which was found to be significant. The adjusted final means yielded the 'F' ratio of 28.877 and was found significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 3 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in Sit Ups)

Circuit training	Plyometric training	Interval training	Control	Difference between means	Critical dif. for adjusted mean
26.935	28.560			1.525*	1.323
26.935		25.810		1.125	1.323
26.935			24.460	2.475*	1.323
	28.560	25.810		2.750*	1.323
	28.560		24.460	4.100*	1.323
		25.810	24.460	1.350*	1.323

* Significance at 0.05 level It was clear from the Table 3 that the mean differences with respect to performance in sit ups of all the experimental groups were found to be significantly greater than that of control group. Plyometric training group was found to be significantly better than both circuit training and interval training. However, no significant difference between circuit training group and interval training group was found with respect to sit ups performance.

TABLE – 4(Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in One Mile Run/Walk)

Groups	Pre-test mean±SE	Post-test mean±SE	Diff. between means	SE	't' ratio
Circuit training	12.855±0.242	10.170±0.174	2.685	0.102	26.451*
Plyometric training	12.877±0.193	9.891±0.160	2.985	0.056	53.738*
Interval training	12.869±0.217	10.080±0.169	2.789	0.092	30.208*
Control	12.980±0.228	12.896±0.201	0.084	0.109	0.773

* Significant at 0.05 level of confidence, 't' $_{0.05}$ (29) = 2.045. Table 4 clearly reveals that all the experimental groups improved significantly yielding 't' value of 26.451, 53.738 and 30.208 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit ups performance of subjects indicating 't' values of 0.773. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 5 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in One Mile Run/Walk)

	Circuit training	Plyometric training	Interval training	Control	Sum of squares	df	Mean square	F ratio
Pre-test means	12.855 ±0.242	12.877 ±0.193	12.869 ±0.217	12.980 ±0.228	B 0.297 W 169.237	3 116	0.099 1.459	0.068
Post-test means	10.170 ±0.174	9.891 ±0.160	10.080 ±0.169	12.896 ±0.201	B 183.827 W 108.831	3 116	61.276 0.938	65.312*
Adjusted post-test means	10.199 ±0.071	9.905 ±0.071	10.100 ±0.071	12.833 ±0.071	B 173.145 W 17.508	3 115	57.715 0.152	379.098*

* Significant at 0.05 level of confidence , N = 120, B = Between group variance, W = Within group variance. The analysis of covariance for one mile run/walk showed that the resultant 'F' ratio of 0.068 was not significant in case of pre test means. The post test means yielded 'F' ratio of 65.312, which was found to be significant. The adjusted final means yielded the 'F' ratio of 379.098 and was found to be highly significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 6 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in One Mile Run/Walk)

Circuit training	Plyometric training	Interval training	Control	Diff. between means	Critical diff. for adjusted mean
10.199	9.905			0.294	1.717
10.199		10.100		0.099	1.717
10.199			12.833	2.634*	1.717
	9.905	10.100		0.195	1.717
	9.905		12.833	2.828*	1.717
		10.100	12.833	2.733*	1.717

* Significance at 0.05 level. It is clear from the Table 6 that the mean differences with respect to performance in one mile run/walk of all the experimental groups were found to be significantly better than that of control group with decreased numerical value. However, no significant difference among the experimental groups was found with respect to one mile run/walk performance.

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TABLE – 7 (Significance of Difference between Pre-Test and Post-Test Means of the three Experimental Groups and the Control Group in Sit and Reach)

Groups	Pre-test mean±SE	Post-test mean±SE	Diff. between means	SE	't' ratio
Circuit training	25.900±0.522	29.733±0.431	3.833	0.292	13.129*
Plyometric training	25.800±0.463	29.633±0.417	3.833	0.250	15.363*
Interval training	25.800±0.564	29.833±0.431	4.033	0.293	13.740*
Control	25.867±0.552	25.833±0.424	0.033	0.206	0.162

* Significant at 0.05 level of confidence, 't' $_{0.05}$ (29) = 2.045. Table 13 reveals that all the experimental groups improved significantly yielding 't' value of 13.129, 15.363 and 13.740 with regard to circuit training, plyometric training and interval training, respectively, where as the control group did not show any significant improvement in sit and reach performance of subjects indicating 't' values of 0.162. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 8 (Analysis of Variance and Covariance of the Means of three Experimental Groups and the Control Group in Sit and Reach)

	Circuit training	Plyometric training	Interval training	Control	Sum of squares	df	Mean square	F ratio
Pre-test means	25.900 ±0.522	25.800 ±0.463	25.800± 0.564	25.867± 0.552	B 0.225 W 965.762	3 116	0.075 8.326	0.009
Post-test means	29.733 ±0.431	29.633 ±0.417	29.833± 0.431	25.833± 0.424	B 342.825 W 631.167	3 116	114.275 5.441	21.002*
Adjusted post-test means	29.692 ±0.212	29.663 ±0.212	29.863 ±0.212	29.816 ±0.212	B 347.035 W 154.720	3 115	115.678 1.345	85.981*

* Significant at 0.05 level of confidence, N = 120, B = Between group variance, W = Within group variance. The analyses of variance for sit and reach test performance showed that the resultant 'F' ratio of 0.009 was not significant in case of pre test means. The post test means yielded 'F' ratio of 21.002, which was found to be significant. The adjusted final means yielded the 'F' ratio of 85.981 and was found significant. The 'F' ratio, needed for significance at 0.05 level of confidence (df 3, 116) was 2.680.

TABLE – 9 (Paired Adjusted Final Means and Differences between Means for the three Experimental Groups and the Control Group in Sit and Reach)

Circuit training	Plyometric training	Interval training	Control	Diff. between means	Critical diff. for adjusted mean
29.692	29.663			0.029	0.032
29.692		29.863		0.171*	0.032
29.692			29.816	0.124*	0.032
	29.663	29.863		0.200*	0.032
	29.663		29.816	0.153*	0.032
		29.863	29.816	0.047*	0.032

* Significance at 0.05 level, It is evident from the Table 15 that the mean differences with respect to sit and reach of all the experimental groups were found to be significantly greater than that of control group. Further, significant difference between interval training group and other two experimental groups was observed making interval group significantly superior. However, no significant difference was found between circuit and plyometric training group with respect to sit and reach performance.

IV. CONCLUSION

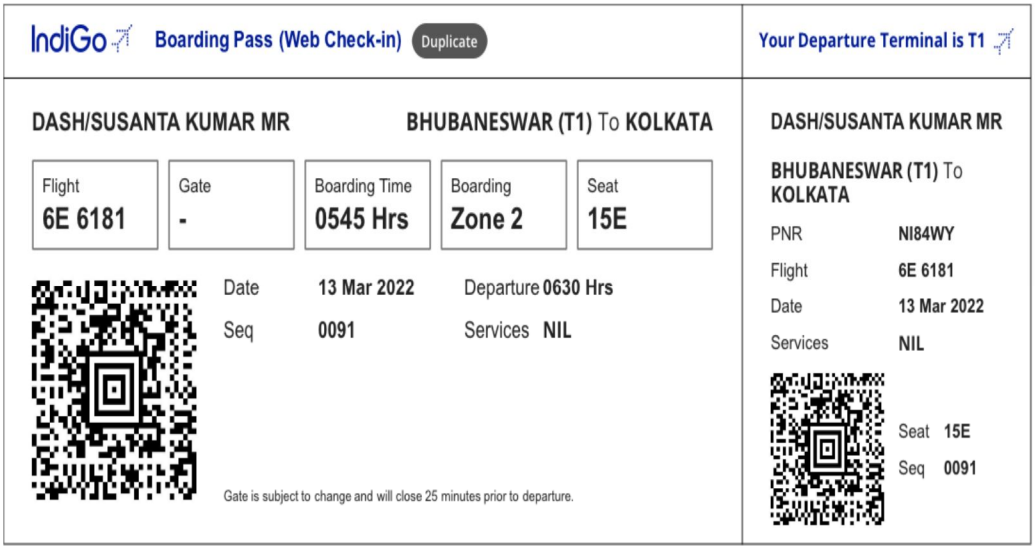
The analysis of data revealed that the three experimental groups, administered with circuit training, plyometric training and interval training showed significant gains in performance of motor fitness components after administration of training for duration of 6 weeks. The control group did not show any significant increase in the performance of any variable under study. Plyometric training schedule could enhance the performance in sit ups with higher intensity than both circuit and interval training. Similarly interval training could prove to be significantly better than both circuit and plyometric training towards enhancing performance of subjects in sit and reach test. Above all each fitness parameters under present study was improved through all three trainings. The results of the study coincided with the general conception that plyometric exercise improves speed and agility, circuit training helps improve strength and endurance and interval training helps flexibility and endurance of the players in a progressive manner.

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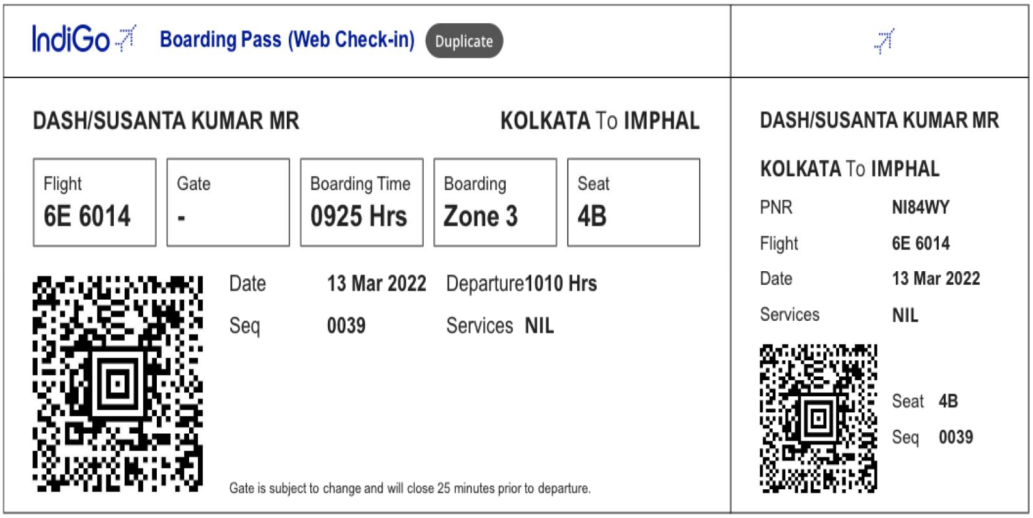
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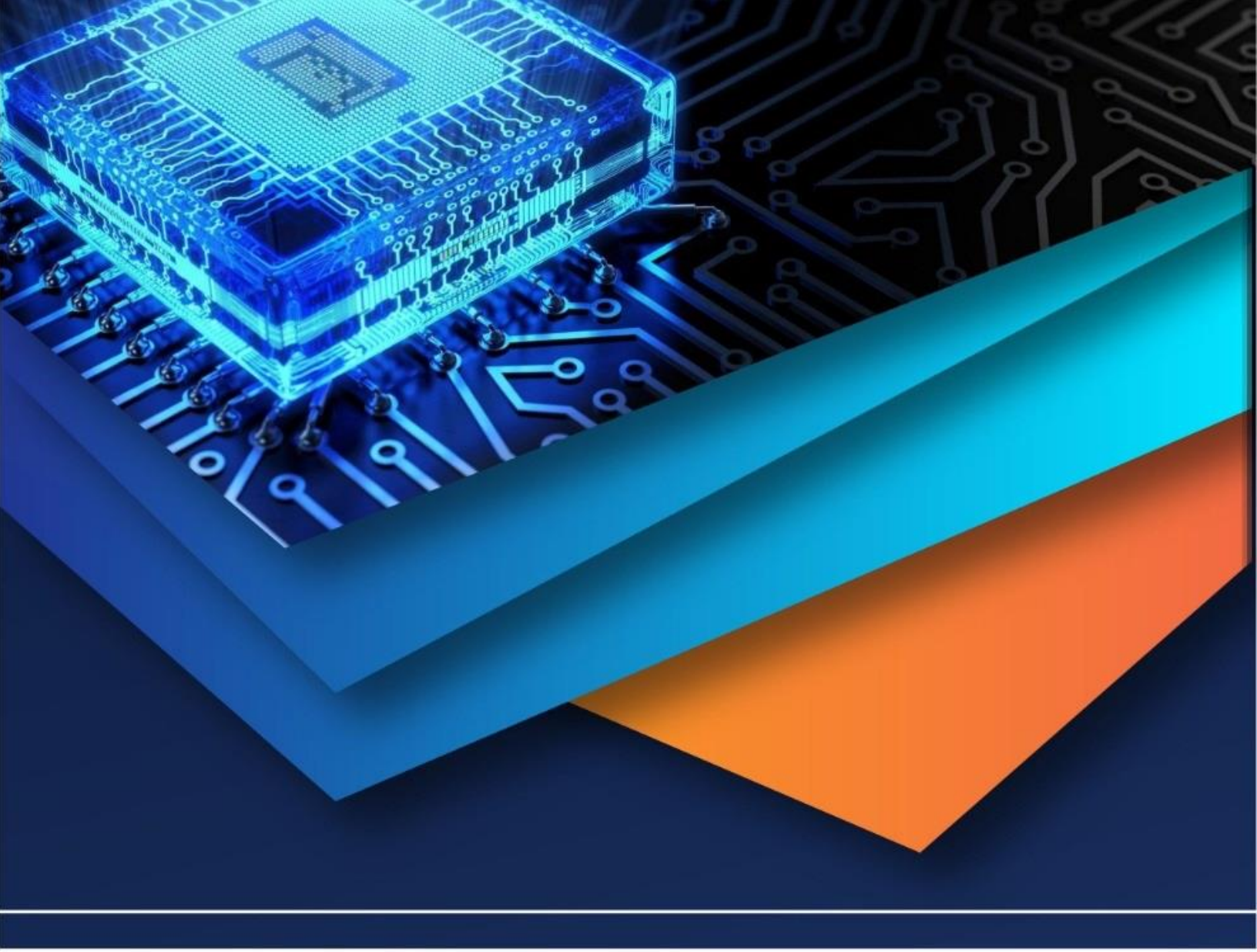
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