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Effect of Circuit Training and Interval Training on Health Related Physical Fitness of Physical Education Professional Students

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Abstract: ***The purpose of this study was to know the effect of circuit training and interval training on health related physical fitness of physical education professional students. Ninety boys belonging to B.P.Ed class of Govt. College of physical Education, Bhubaneswar age ranging between 22 to 25 years acted as subjects and assigned to three groups (two experimental and one control group) with 30 students each. The two experimental groups were Circuit Training and Interval Training groups. Health related physical fitness parameters such as Abdominal Muscle Strength (Sit Up), Flexibility (Sit and Reach), Cardiovascular Endurance (1 Mile Run), and Body Fat % (Triceps and Sub-Scapular Skin fold) were measured before and after training. All the experimental Groups (Circuit training and Interval training) was administered with the selected exercises, thrice in a week for a duration of 8 weeks under direct supervision of the research scholars. The analysis of data revealed that the three experimental groups, showed significant gains in performance of health related physical fitness after administration of training for duration of 8 weeks. The control group did not show any significant increase in the performance.***
Key Words: Circuit Training, Interval Training, Health related physical fitness.

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 the effect of* circuit training and interval training *on physical fitness of physical education professional students.*

II. METHODOLOGY

Ninety professional students, *belonging to B.P.Ed class of Govt. College of physical Education, age ranging between 22 to 25 years* acted as subjects and were randomly assigned to three groups i.e., two experimental groups (A and B) and one control group (C), consisting of 30 students each. The experimental treatments were also assigned to the groups at random. The groups A and B were treated as Experimental Groups and were given Circuit Training and Interval Training respectively. The group C served as control group and being kept away from the training schedule and continued in performing normal college programme. Considering the capabilities and existing facilities the above stated training methods were selected for the study. Keeping the feasibility criterion in mind, especially in the case of availability of instruments, the following variables of Health Related Physical Fitness were chosen:

1) Abdominal Muscle Strength (Sit Up),
2) Flexibility (Sit and Reach),
3) Cardiovascular Endurance (1 Mile Run), and
4) Body Fat % (Triceps and Sub-Scapular Skin fold).

All the experimental Groups (Circuit training and Interval training) was administered with the selected exercises, thrice in a week for a duration of 8 weeks under direct supervision of the research scholars.

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III. FINDINGS

The statistical analysis of data on Health Related Physical Fitness components of subjects belonging to two 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 two 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*
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 and 2.392 with regard to circuit training and interval training, respectively, whereas 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(Significance of Difference between Pre-Test and Post-Test Means of the two 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*
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 2 clearly reveals that all the experimental groups improved significantly yielding 't' value of 26.451 and 30.208 with regard to circuit training and interval training, respectively, whereas 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 – 3(Significance of Difference between Pre-Test and Post-Test Means of the two Experimental Groups and the Control Group in Triceps Skin Fold Measurement)

Groups	Pre-test mean±SE	Post-test mean±SE	Dif. between means	SE	't' ratio
Circuit training	14.900±0.411	13.633±0.369	1.267	0.244	5.188*
Interval training	14.600±0.364	13.667±0.319	0.933	0.126	7.393*
Control	14.633±0.360	14.733±0.349	0.100	0.121	0.828

* Significant at 0.05 level of confidence, 't' $_{0.05}$ (29) = 2.045. Table 3 reveals that all the experimental groups improved significantly yielding 't' value of 5.188 and 7.393 with regard to circuit training and interval training, respectively, whereas the control group did not show any significant improvement in triceps skin fold measurement of subjects indicating 't' values of 0.828. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 4 (Significance of Difference between Pre-Test and Post-Test Means of two Experimental Groups and The Control Group in Sub-Scapular Skin Fold Measurement)

Groups	Pre-test mean±SE	Post-test mean±SE	Dif.between means	SE	't' ratio
Circuit training	14.433±0.459	13.200±0.301	1.233	0.213	5.798*
Interval training	14.567±0.462	13.367±0.351	1.200	0.206	5.835*
Control	14.400±0.554	14.567±0.462	0.167	0.145	1.153

* Significant at 0.05 level of confidence, 't' $_{0.05}$ (29) = 2.045. Table 4 reveals that all the experimental groups improved significantly yielding 't' value of 5.798 and 5.835 with regard to circuit training and interval training, respectively, whereas the control group did not show any significant improvement in sub-scapular skin fold measurement of subjects indicating 't' values of 1.153. The needed 't' value for significance at 0.05 level of confidence with 29 degrees of freedom was 2.045

TABLE – 5 (Significance of Difference between Pre-Test and Post-Test Means of the two 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*
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 5 reveals that all the experimental groups improved significantly yielding 't' value of 13.129 and 13.740 with regard to circuit training and interval training, respectively, whereas 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

IV. CONCLUSION

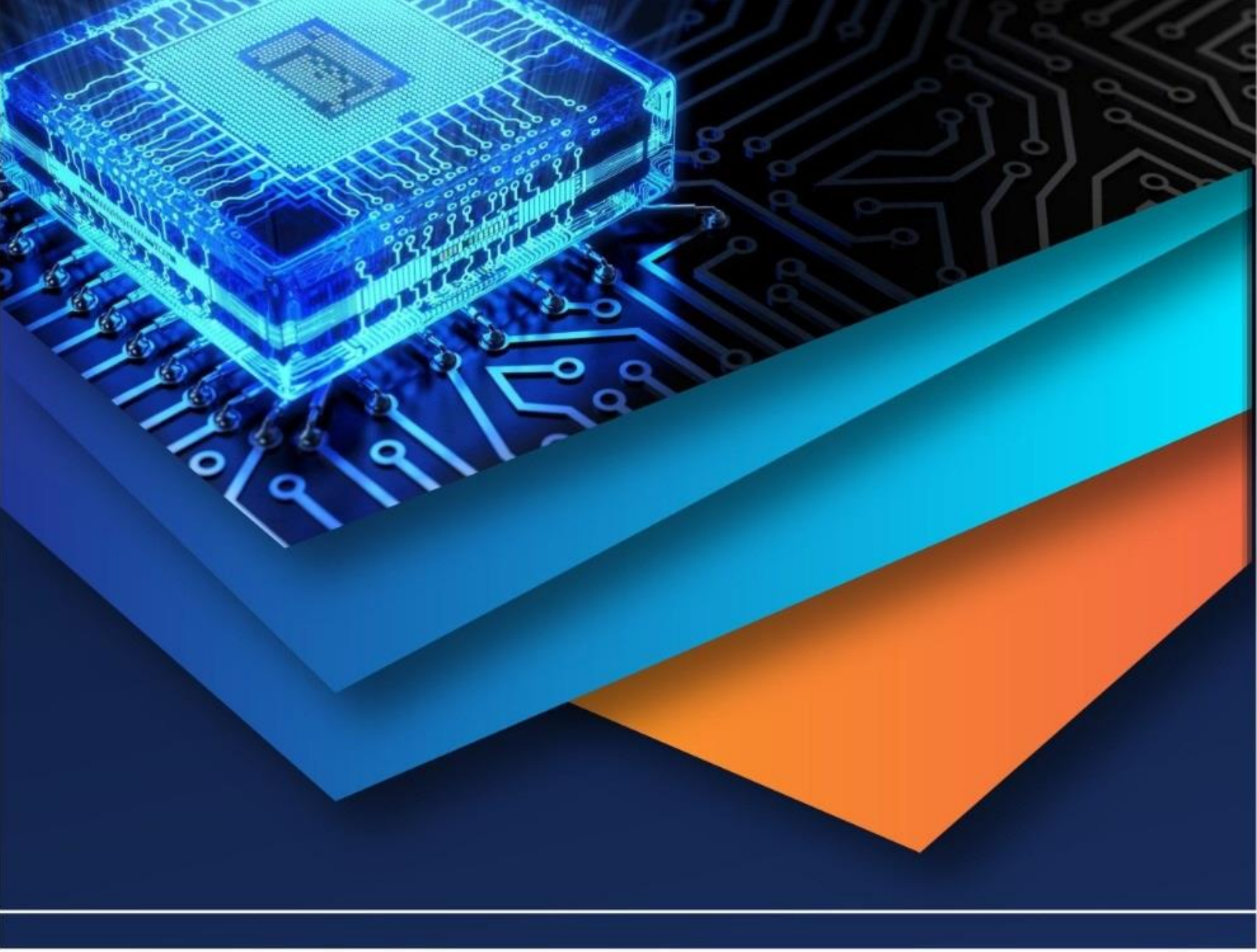
The analysis of data revealed that the two experimental groups, administered with circuit training and interval training showed significant gains in performance of fitness components after administration of training for duration of 8 weeks. The control group did not show any significant increase in their performance of any variable under study. Similarly interval training could prove to be significantly better than circuit training towards enhancing performance of subjects in sit and reach. Above all each fitness parameters under present study was improved through all two trainings. The results of the study coincided with the general conception that circuit training helps in improve strength and endurance and interval training helps speed, agility, flexibility and endurance of the students in a progressive manner.

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