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A STUDY OF EFFECT OF PLYOMETRIC TRAINING, CIRCUIT TRAINING AND COMBIEND TRAINING ON SPEED AND FLEXIBILITY OF SECONDARY SCHOOL

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Abstract:

The physical fitness is the mandatory to the modern world. Which throws continuous challenges in all walks of life, keeping this in view and in the context of sports and games to sustain and continue to win in successive competitions athletes of various games and sports has to put up great effort, dedication & vigorous practice. Since their childhood athletes with regular & systematic plan in training need to keep up the winning streak. Sports and games activities require physical fitness to improve the Speed and Flexibility refers to the capacity to mould to the sports personal body in any direction effortlessly within fraction of seconds as per the ground situation. plyometric, circuit training combined training etc. methods employed to enhance to Speed and Flexibility.

Keywords: Speed, Flexibility Plyometric and Circuit training

1. Introduction

Physical education is conventionally perceived as an activity period given to the students to make them involve in sports and games along with some exercise training. But physical education has manifold roles in developing a child's personality and can catalyze the success in his profession. Coaches will impart physical as well as psychological needs of an individual. Physical education plays a central role in goal setting and will make the students capable of pursuing their dreams. Moreover team spirit will be developed in every athlete and is highly significant when it comes to a game of multiple members1. Development of social skills is an added advantage of physical education sessions. They will gain awareness in the need of balanced diet. In the olden days physical fitness was crucial to safeguard themselves from animal attacks and life a life in unison with nature. Later it developed for safeguarding one's own country from the attack of enemy, particularly warfront. These days, physical fitness is required for achieving excellence in sports and games field. Physical exercises enhances bone strength, reduces stress, maintains normal blood pressure and cholesterol, elevates self- esteem, lends a feeling of well- being, so on and so forth. Systematic and constant training methods are central to this purpose.

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"Plyometric training", "circuit training" and "interval training" are the three major training methods to assist the athletes to go beyond the mundane performance2.

Plyometric training

"Plyometric training" is also called as "plyometrics" or "shock training" is a training mode which consists of jump, bound, skip etc. It has many advantages. It improves involuntary nervous reflexes and motor coordination. This method is a blessing to both explosive and endurance- oriented athletes4.

Circuit training

"Circuit training" is a pattern of consecutive temporal- based activities performed one after the other in a systematic manner with considerable rest in between. It is beneficial for injury recuperation, better cardiovascular functioning and weight loss5

Statement of the problem

This study envisioned to contrast the effects of "Plyometric training", "Circuit training" and "Combined training" based on the Speed and Flexibility of students.

3. Methodology

The researched employed four different training clusters for doing the same. For this amateur school-going students raining from fourteen and fifteen years of age were selected from "Ekasila High School, Warangal". They were instructed to attend the training sessions provided in school. Thirty students were selected from three hundred students. Afterwards they were split into four separate groups with ten students each. These groups were given names as "Plyometric training group", "Circuit training group" ,"Combined training group" and "Control group" respectively. The performance of these students was supervised before the commencement and after twelve weeks of completion. In both "Plyometric group" and "circuit group", eight exercises were implemented. On Tuesday, Thursday and Saturday, the students of "combined training group" were asked to merge with "plyometric training group". Similarly the "combined training group" were instructed to join with "circuit training group" on Monday, Wednesday and Friday. The test items given below were used.

1. "Sit and reach method" to assess "flexibility"
2. "50 min Sprint" to assess "speed".

The fourth group, named "control group" did not partake in any of these training methods, except their routine. Later "t test" and "Anacova" were used for knowing which training method is better.

4. Results and Discussion

The results provided below are generated after employing the suggested approaches.

Table:4.1 Results of consolidated 't' test 50Mts Sprint

Test Items	Obtained"t"value				Required "t' value at 0.01level
	Plyometric Training group	Circuit Training group	Combined Training group	Control group	
50Mts Sprint	9.04*	6.81*	9.79*	060	3.2

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*significant at 0.01 level

The tabular data gives a realization that, the performance of the teams got improved considerably in accordance with “50 min sprint”.

The diagrammatic representation of the data of pre and post test values of Control Group, Plyometric Training Group, Circuit Training Group and Combined Training Group for 50mts Sprint (Boys) is shown in figure 4.1 and pre, post and adjusted post test mean in figure 4.1 as bar diagrams and the measurements were shown in Seconds. The statistical analyses carried out on the data presented in figure 4.1 & 4.2 are shown in table 4.1, 4.2 and 4.3.

The analysis of “t” test on 50mts Sprint (Boys) Pre and Post test mean values of Control Group, Plyometric Training Group, Circuit Training Group and Combined Training Groups have been presented in table 4.1. The data pertaining to Pre and Post results were presented in Seconds.

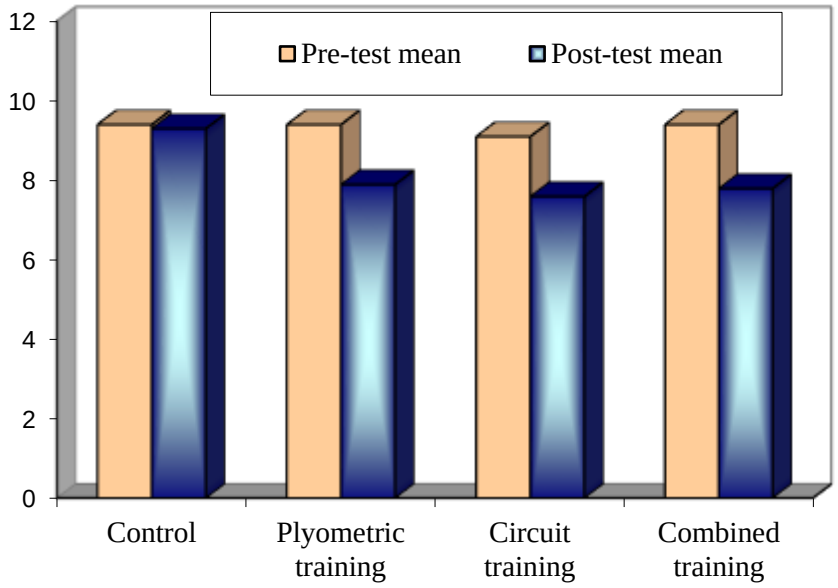

Figure 4.1 bar Diagram Representing Pre and Post Test Performances

Table: 4.2 Analysis of covariance. 50Mts Sprint Test

Source of variation	d.f	SSx	SSy	SSxy	SSyx	MSSyx
Treatment group Mean	N-1 4-1=3	0.68	18.1	1.65	16.42	5.47
Error	N-K-1 40-4-1=35	12.1	39	6.4	35.61	1.02
Total	38	12.78	57.1	8.05	52.03	

*significant at 0.01 level, Fyx=54.36 F0.01=4.35 (3,35)

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With regard to "speed", the training methods used for this experiment are not effective in the similar modularity as per the tabular data. In order to assess the effectiveness of the methods, "pair-wise comparison analysis on adjusted means of post test data" was done.

Analysis of covariance is used to test the data of adjusted post test mean values of Control group, Plyometric training group, Circuit training group and Combined training groups on 50mts Sprint(Boys) were shown in figure 4.2 as a bar diagram and the measurements were shown in Seconds.

The analysis of co-variance on 50mts Sprint(Boys) between pre and post test mean values of Control group, Plyometric Training group , Circuit Training group and Combined Training groups have been presented in table 4.2. The data pertaining to pre and post test results of 50mts Sprint(Boys) were presented in Seconds.

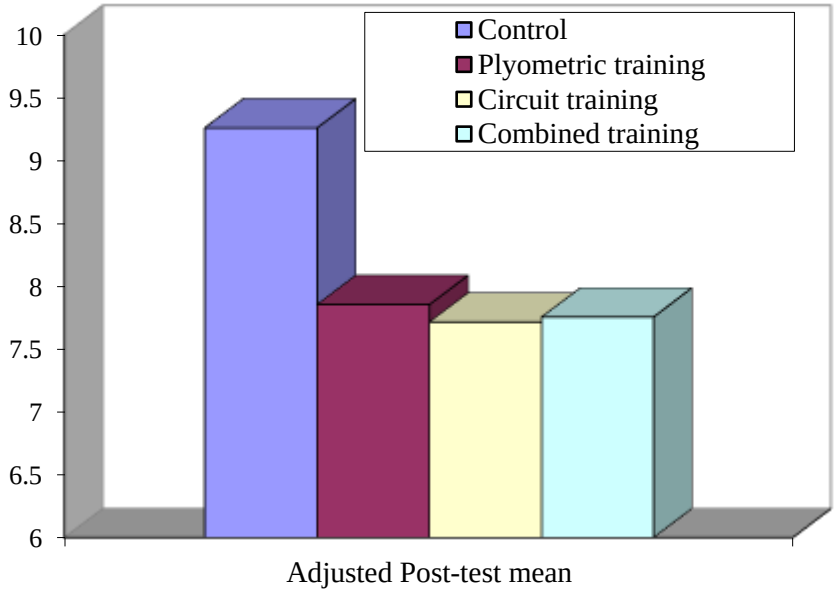

Fig. 4.2: diagrammatic performances of adjusted post-test mean of control, plyometric training, circuit training and combined training groups on 50 meters sprint .

Table: 4.3 Schiff's Post Hoc Test. 50Mts Sprint Comparison Adjusted Post Test Mean

Control Group	Plyometric Training Group	Circuit Training Group	Combined Training Group	Mean Difference	Confidence Interval 0.01 Level
9.26	7.86			1.4**	1.39
9.26		7.72		1.54*	
9.26			7.76	1.5*	
	7.86	7.72		0.14	
	7.86		7.76	0.1	
		7.72	7.76	0.04	

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The table displays that, the training method blends like “Plyometric training” and “combined training” are successful in same manner. This is similar to the amalgamation of “combined training” and “circuit training” methods. “Plyometric training” and “circuit training” approaches are also efficient. In brief, each training methods under observation are efficient with respect to the derived results. “Circuit training” is regardedas the best method among all the rest.

Table:4.4 Results of consolidated ‘t’ Sit and Reach Test

Test Items	Obtained”t”value				Required “t’ value at 0.01level
	Plyometric Training group	Circuit Training group	Combined Training group	Control group	
Sit and Reach Test	13.53*	16.54*	16.54*	0.55	3.2

*significant at 0.01 level

While applying “sit and reach” method, the performance of the students has increased rapidly and the same fact is being presented in this table.

The diagrammatic representation of the data of pre and post test values of Control Group, Plyometric Training Group, Circuit Training Group and Combined Training Group for Sit and Reach(Boys) test is shown in figure 4.3 and pre, post and adjusted post test means in figure 4.4 as bar diagrams and the measurements were shown in Inches. The statistical analyses carried out on the data presented in figure 4.4 & 4.5 are shown in table 4.4, 4.5 and 4.6.

The analysis of “t” test on Sit and Reach test (Boys) Pre and Post test mean values of Control Group, Plyometric Training Group, Circuit Training Group and Combined Training Groups have been presented in table 4.4. The data pertaining to Pre and Post results were presented in Inches.

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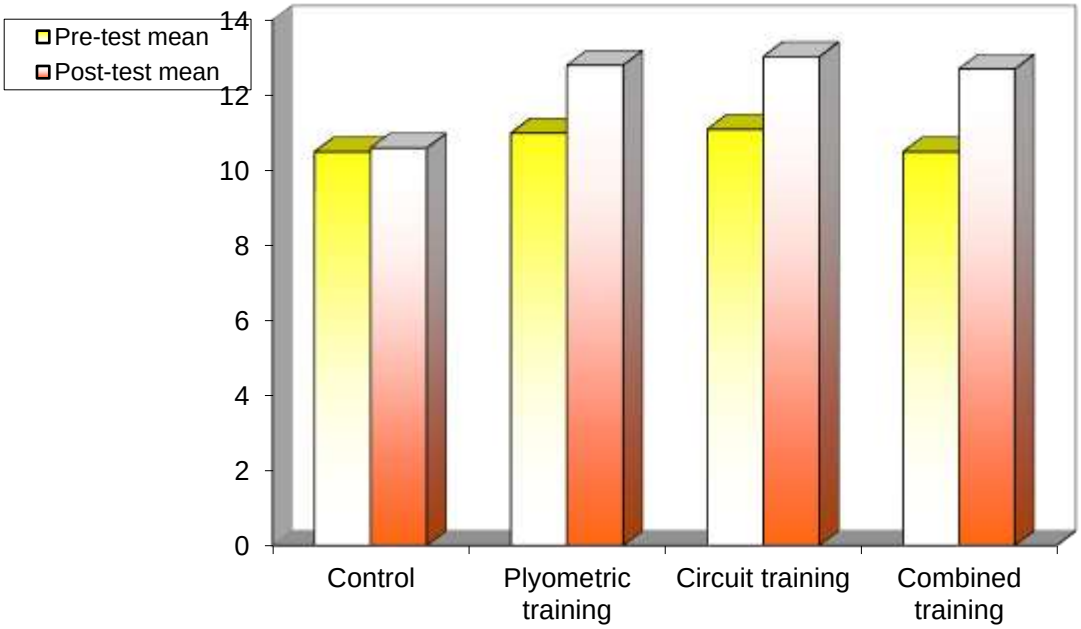

Fig 4.4: Bar Diagram Representing Pre And Post Test Performances Of Figure

Table: 4.5 Analysis of covariance. Sit and Reach Test

Source of variation	d.f	SSx	SSy	SSxy	SSyx	MSSyx
Treatment group Mean	N-1 4-1=3	3.08	42.9	7.95	30.72	10.24
Error	N-K-1 40-4-1=35	55.9	44.2	46.2	6.02	0.17
Total	38	58.98	87.1	54.15	36.74	

*significant at 0.01 level, Fyx=60.23 F0.01=4.35 (3,35)

In case of "flexibility", all the training approaches are not efficient in the same mode. "Pair-wise comparison analysis on adjusted means of post-test data" has done to determine the best method among all the tests.

Analysis of covariance is used to test the data of adjusted post test mean values of Control group, Plyometric training group, Circuit training group and Combined training groups on Sit and Reach test were shown in figure 4.5 as a bar diagram and the measurements were shown in Inches.

The analysis of co-variance on Sit and Reach test between pre and post test mean values of Control group, Plyometric Training group , Circuit Training group and Combined Training groups have been presented in table 4.4. The data pertaining to pre and post test results of Sit and Reach test were presented in Inches.

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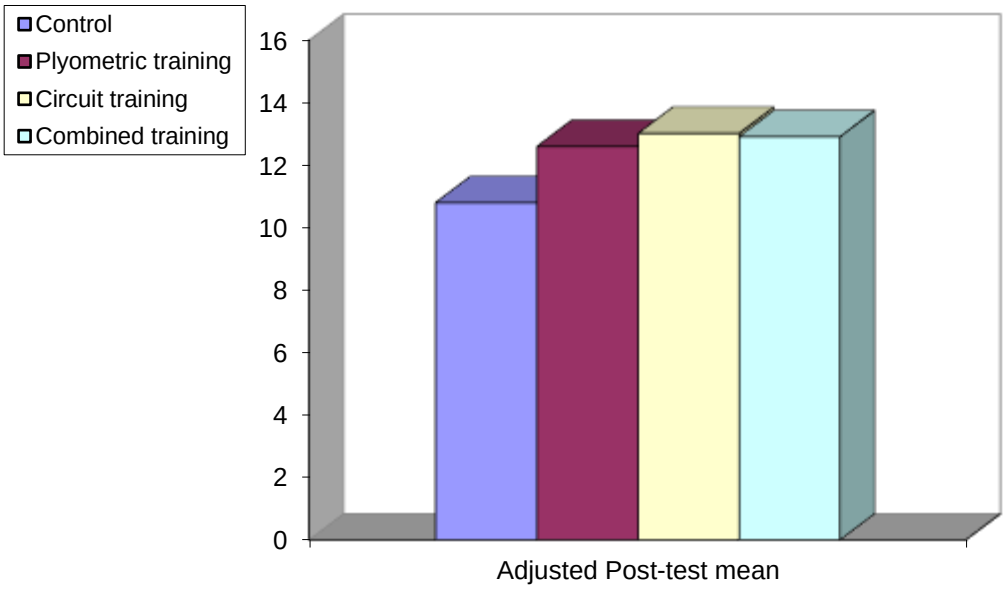

FIGURE 4.5:-DIAGRAMATIC PERFORMANCES OF ADJUSTED POST-TEST MEAN OF CONTROL, PLYOMETRIC TRAINING, CIRCUIT TRAINING AND COMBINED TRAINING GROUPS ON SIT AND REACH TEST (BOYS)

Table: 4.6 Schiff's Post Hoc Test. Sit and Reach Test Comparison Adjusted Post Test Mean

Control Group	Plyometric Training Group	Circuit Training Group	Combined Training Group	Mean Difference	Confidence Interval 0.01 Level
10.82	12.61			1.79*	0.79
10.82		13.03		2.21*	
10.82			12.92	2.1*	
	12.61	13.03		0.42	
	12.61		12.92	0.31	
		13.03	12.92	0.11	

This table showcases the actuality that, "plyometric training group" and "combined training group" are competent in the similar way. Same in the case of"combined training group" and "circuit training group". A striking fact is that, "plyometric training" and "circuit training" are productive in the same fashion. However, with regard to the difference in the overall result, "circuit training" is preferable.

5. Conclusions

1. The Plyometric, Circuit and Combined Training groups showed remarkable development in twelve weeks of coaching on Speed and Flexibility at 0.01 level of significance.
2. The Plyometric Training group showed significant improvement due to twelve weeks of Plyometric Training on Speed and Flexibility at 0.01 level of significance.

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3. The Circuit Training group showed significant improvement due to twelve weeks of Circuit Training on Speed and Flexibility at 0.01 level of significance.
4. The Combined Training group showed significant improvement due to twelve weeks of Combined Training on Speed and Flexibility at 0.01 level of significance.
5. The Control group failed to produce significant improvement on Speed and Flexibility.
6. Circuit training group has shown better improvement than the Plyometric and Combined training group with respect to Speed.
7. Circuit training group has shown better improvement than the Plyometric and Combined training group with respect to Flexibility.

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