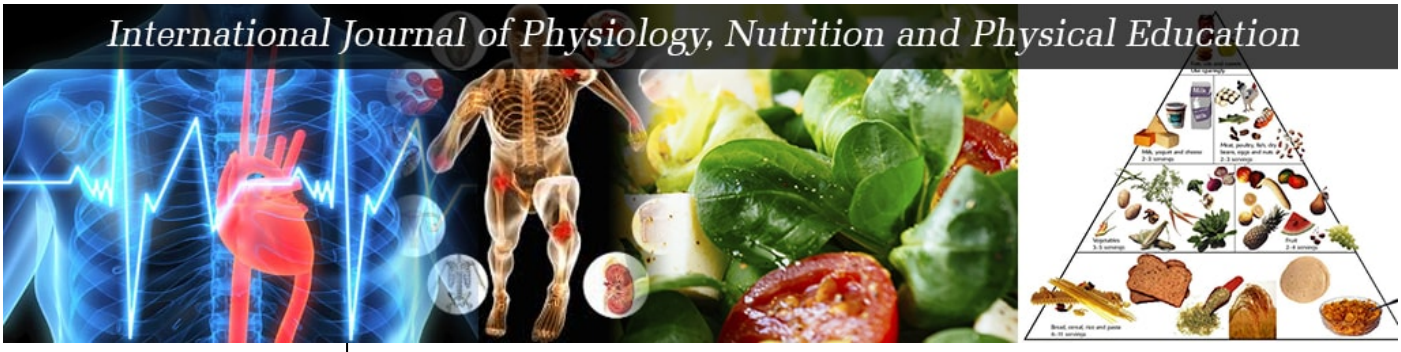

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Dr. M Pari
Director of Physical Education, S.I.V.E.T College, Gowrivakkam, Chennai. Affiliated to the University of Madras, Chennai, Tamil Nadu, India

Correspondence
Dr. M Pari
Director of Physical Education, S.I.V.E.T College, Gowrivakkam, Chennai. Affiliated to the University of Madras, Chennai, Tamil Nadu, India

Effect of six weeks of varied circuit training frequencies on speed and explosive power among volleyball players

Dr. M Pari

Abstract
The purpose of the study was to find out the effect of 6 weeks of varied circuit training frequencies on speed and explosive power among volleyball players. To achieve the purpose of the study 30 volleyball players were selected as subjects from Chennai district. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into three equal groups of 10 subjects, Group - I underwent Low Frequency Circuit Training (LFCT) two days per week, group - II underwent Medium Frequency Circuit Training (MFCT) four days per week and group - III acted as Control Group (CG). Training period limited with 6 weeks of training. The selected criterion variables speed and explosive power assessed before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement on speed and explosive power among the experimental group when compared with the control group.

Keywords: Circuit training, speed and explosive power

Introduction
The word “training” means different things in different fields. In sports the word “training” is generally understood to be synonyms doing physical exercises for the improvement of performance. This concept is reflected in words for terms which are gives to separate components of training or separate methods of procedures of doing physical exercise. Sports, medicine and exercise physiologists also understand training to be doing physical exercises for improvement of performance or separate performance factors.
Circuit training can be used to develop both speed and explosive power as well as combination of strength for the purpose of the anatomical adaptation phase. It will be adjusted to serve the development of strength. Circuit training developed in England in 1953, it was designed as all purpose type of training programme for the development of strength, power, muscular, speed, agility, flexibility and cardio vascular endurance.
“A circuit usually consists of 6 to 12 stages each focusing on one exercise, so that all areas of the body are covered n a complete circuit. The entire circuit should be completed as rapidly as possible repeating the circuit 3 times.
A specific amount of work is pre-assigned for each stage. As one becomes better conditioned the amount of time it takes to complete the circuit is reduced and the amount of work accomplished at each stage is increase. In addition the circuit was designed for different levels of competence so that with improvement one moves up to the highest level. Each successive level requires a greater amount of work at each stage. Circuit training is a variation of general circuit training, applying the same principle in a weight training mode.”

Methodology
The purpose of the study was to find out the effect of 6 weeks of varied circuit training frequencies on speed and explosive power among volleyball players. To achieve the purpose 30 volleyball players were selected as subjects from Chennai district. The age of the subjects were ranged from 18 to 25 years. The subjects were further classified at random into three equal groups of 10 subjects Group - I underwent Low Frequency Circuit Training (LFCT) two days per week, group - II underwent Medium Frequency Circuit Training-(MFCT) four days

per week for six weeks and group - III acted as Control Group (CG). The selected criterion variable speed and explosive power assessed before and after the training period.

Statistical Technique

The collected data were statistically analysed by using Analysis of Covariance (ANCOVA).

Table 1: Analysis of co variance on speed of experimental and control groups

	Ex- 1 (LFCT)	Ex -2 (MFCT)	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	5.49	5.42	5.41	BG	0.10	2	0.05	0.49
				WG	0.288	27	0.01	
Post-Test Means	5.13	5.00	5.25	BG	0.29	2	0.14	10.60*
				WG	0.37	27	0.01	
Adjusted Post-Test Means	5.14	5.00	5.24	BG	0.29	2	0.14	12.80*
				WG	0.29	26	0.01	

*Significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence with df 2 and 27 and 2 and 26 were 3.36 and *3.35* respectively).

The obtained F value on pre test scores 0.49 was lesser than the required F value of 3.36 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 10.60 was greater than the required F value at 3.36. This proved that the differences between the post test mean at the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 12.80 was greater than the required F value at 3.35 to be significant at 0.05 level and hence it was accepted that there was significant difference among the adjusted post test means on speed of the subjects. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results are presented in Table 2.

Table 2: Scheffe S Test for the Difference between the Adjusted Post-Test Mean of Speed

Ex- I (LFCT)	Ex- II (MFCT)	CG	Mean Difference	Confidence Interval
5.13	5.00	-	0.13*	0.11
5.13	-	5.25	0.12*	
-	5.00	5.25	0.25*	

* Significant at .05 level of confidence

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 0.11. The Low frequency circuit training (LFCT) and medium frequency circuit training (MFCT) (MD; 0.13) and Low frequency circuit training (LFCT) and Control Group (CG) (MD: 4.67) and Medium frequency circuit training (MFCT) and Control Group (CG) (MD:0.25) were greater than the required confidence interval and were significant at 0.05 level.

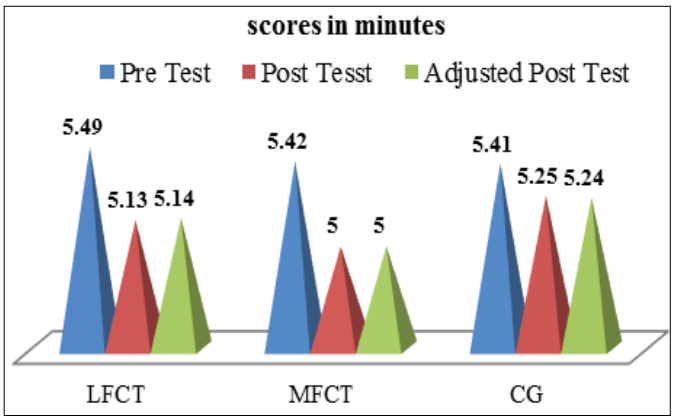

Fig 1: Bar Diagram showing Pre, Post and Adjusted Means on Speed

Discussion on findings of speed

The results presented in Table 1 proved that there was significant differences on speed, as the obtained F value was greater than the required table value to be significant at 0.05 level. The post hoc analysis result (Table 2) proved that comparing to control group, Low frequency circuit training (LFCT) and Medium Frequency Circuit Training (MFCT) improved speed of volleyball players. The post hoc results Table 2 further proved that comparing to control group and treatment groups, it was found that Medium Frequency Circuit Training (MFCT) was significantly better than the Low Frequency Circuit Training (LFCT) group and control group on speed among volleyball players.

Table 3: Analysis of co variance on explosive power of experimental and control groups

	Ex- 1 (LFCT)	Ex -2 (MFCT)	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	47.70	49.50	46.90	BG	35.46	2	17.73	0.52
				WG	919.50	27	34.0	
Post-Test Means	51.80	55.30	47.20	BG	954.96	2	165.03	4.56
				WG	330.06	27	36.12	
Adjusted Post-Test Means	52.13	53.81	48.34	BG	151.97	2	75.98	64.92
				WG	30.42	26	1.17	

*significant at .05 level of confidence.

(The table values required for significance at .05 level of confidence with df 2 and 27 and 2 and 26 were 3.36 and *3.35* respectively).

The obtained F value on pre test scores 0.52 was lesser than the required F value of 3.36 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 4.56 was greater than the required F value

at 3.36. This proved that the differences between the post test mean at the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 64.92 was greater than the required F value at 3.35 to be significant at 0.05 level and hence it was accepted that there was significant difference among the adjusted post test means on explosive power of the subjects. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's Confidence Interval test. The results are presented in Table 4.

Table 4: Scheffe S test for the difference between the adjusted post-test mean of explosive power

Ex – I (LFCT)	Ex – II (MFCT)	CG	Mean Difference	Confidence Interval
	53.81		1.68*	1.25
52.13		48.34	3.79*	
	53.81	48.34	5.47*	

*Significant at .05 level of confidence.

The post hoc analysis of obtained ordered adjusted means proved that to be significant at 0.05 level confidence the required confidence interval was 1.25. The Low frequency circuit training (LFCT) and medium frequency circuit training (MFCT) (MD; 1.68) and Low frequency circuit training (LFCT) and Control Group (CG) (MD: 3.79) and Medium frequency circuit training (MFCT) and Control Group (CG) (MD: 5.47) were greater than the required confidence interval and were significant at 0.05 level.

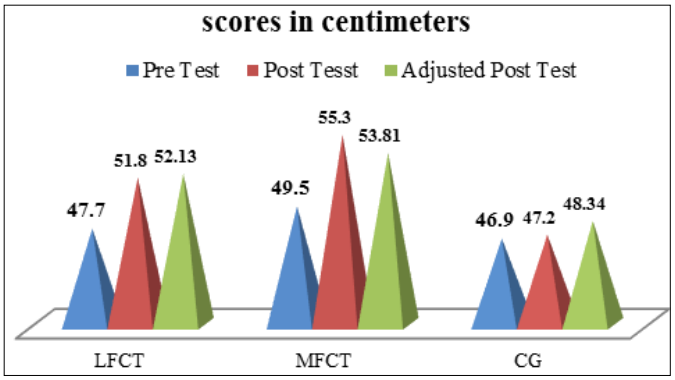

Fig 2: Bar Diagram showing Pre, Post and Adjusted Means on Explosive Power

Discussion on findings of explosive power

The results presented in Table 3 proved that there was a significant difference on explosive power, as the obtained F value was greater than the required table value to be significant at 0.05 level. The post hoc analysis result (Table 4) proved that comparing to control group, Low frequency circuit training (LFCT) and Medium Frequency Circuit Training (MFCT) improved explosive power of volleyball players. The post hoc results Table 4 further proved that comparing to control group and treatment groups, it was found that Medium Frequency Circuit Training (MFCT) was significantly better than the Low Frequency Circuit Training (LFCT) group and control group on explosive power among volleyball players.

Conclusions

On the basis of the interpretation of the data, there was a significant difference between varied frequencies of circuit training groups and control group on selected variable of speed and explosive power, further it was concluded that medium frequency circuit training group better than low frequency circuit training and control group on improving a speed and explosive power.

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