



Impact of Different frequencies of Circuit Training on Muscular Strength

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Abstract

The purpose of the study was to find out the impact of varied circuit training frequencies on muscular strength. To achieve this purpose, 30 school level Kabaddi players were selected as subjects from Cuddalore district. The age of the subjects were ranged from 15 to 17 years. The subjects were further classified at random into three equal groups of 10 subjects. Group - I underwent low frequency circuit training-three days per week, group - II underwent medium frequency circuit training-four days per week for eight weeks and group - III acted as control. The selected criterion variable muscular strength 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 muscular strength among the Experimental group when compared with the control group.

Keywords: Circuit Training, Muscular Strength.

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Introduction

“The body is the temple of the soul and to reach harmony of body, mind and spirit the body must be physically fit”. Aristotle. Man is an indivisible unite and he cannot be compartmentalized into body, mind, spirit etc., as he functions as a whole The psychosomatic relationship is an accepted scientific fact and related the philosophy of total well being or mental well being Hence, the total development of the children physical, mental and social are to be taken care so that they may develop into healthy, happy and good citizens. 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. Training involves constructing an exercise programme to develop an athlete for particular athletic event. Thus, increasing skill and energy capacities are equal consideration. Circuit training can be used to develop both cardio respiratory endurance 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 in 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.”

Circuit training exercise must be selected to alternate muscle groups favoring than for a better and faster recovery. The rest interval between stages can be anywhere between 60 — 90 seconds and 1 — 3 minutes between circuits. Since in a normal gym there are different apparatuses, work stages and strength training machines, a high variety of circuits can be created thus constantly challenging athletes skills and at the same time keeping the athletes interested. Hooks⁶ states that the good big man will always beat the good little man. The statement would be even more true, if it read the good strong man will always beat the good weak man. Strength is properly defined “as maximal force exerted at one time.” By working the muscle near its maximum capacity against some resistance will develop the strength of the muscle. Strength is considered an important factor for speed. It is clearly stated that

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“increase in strength leads to increase in speed when the muscles are involved in specific movement.”⁸

Methodology

The purpose of the study was to find out the impact of different frequencies of circuit training on muscular strength. To achieve this purpose, 30 school level Kabaddi players were selected as subjects from Cuddalore district. The age of the subjects were ranged from 15 to 17 years. The subjects were further classified at random into three equal groups of 10 subjects Group - I underwent low frequency circuit training-three days per week group - II underwent medium frequency circuit training-four days per week for eight weeks and group - III acted as control. The selected criterion variable

muscular strength assessed before and after the training period. The selected criterion variable muscular strength assessed before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). Whenever, the obtained ‘F’ ratio was found to be significant, the Scheffe’s test was applied as post hoc test to determine the paired mean differences. All the data were analyzed using SPSS statistical package. The level of confidence was fixed at .05 level of significance. The analysis of covariance on muscular strength of varied frequency of circuit training groups and control group were analysed and presented in Table - I.

Table I. Analysis of co variance on muscular strength of experimental and control groups

Test / Group		Ex. Group I	Ex. Group II	Control Group	Source of variance	Sum of Square	df	Mean Square	obtained ‘F’ Ratio
Pre Test	Mean	14.90	14.50	16.90	B	13.87	2	6.93	3.21
	S.D	1.60	1.37	1.43	W	58.30	27	2.16	
Post test	Mean	17.70	17.50	15.00	B	45.27	2	22.63	12.08*
	S.D	1.42	1.27	1.41	W	50.60	27	1.87	
Adjusted Post test	Mean	17.90	16.79	15.51	B	28.34	2	14.17	21.56*
					W	17.09	26	0.657	

*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).

Table - I showed that the pre-test mean values of muscular strength for low and medium frequency of circuit training groups and control group were 14.90 ± 1.60 , 16.10 ± 1.37 and 14.50 ± 1.43 respectively. The obtained ‘F’ ratio value of 1.25 for pre test scores of low and medium frequency of circuit training groups and control group on muscular strength was less than the required table value of 3.36 for significance with df 2 and 27 at .05 level of confidence. The post-test mean values for muscular strength for low and medium frequency of circuit training groups and control group were 17.70 ± 1.42 , 17.50 ± 1.27 and 15.00 ± 1.41 respectively. The obtained ‘F’ ratio value of 12.08 for post-test scores of low and medium frequency of circuit training groups and control group was greater than the

required table value of 3.36 for significance with df 2 and 27 at .05 level of confidence. The adjusted post-test mean values of muscular strength for low and medium frequency of circuit training groups and control group were 17.90, 16.79 and 15.51 respectively. The obtained ‘F’ ratio value of 21.56 for adjusted post-test scores of low and medium frequency of circuit training groups and control group were greater than the required table value of 3.35 for significance with df 2 and 26 at .05 level of confidence. The results of this study showed that there was a significant difference between low and medium frequency of circuit training groups and control group on muscular strength. Further to determine which of the paired means had a significant difference Scheffe S test was applied and the result was presented in Table-II

Table II. Scheffe s test for the difference between the adjusted post-test mean of muscular strength

Adjusted Post-test Means			Mean Differences	Confidence Interval
Low Intensity Group	High Intensity Group	Control Group		
17.90	16.79	-	1.11	0.936
17.90	-	15.51	2.39*	0.936
-	16.79	15.51	1.28*	0.936

* Significant at .05 level of confidence.

Table -II shows that the adjusted post-test mean difference in muscular strength between low frequency of circuit training group I, medium frequency of circuit training group II and control group were 1.11, 2.39 and 1.28 respectively. Since the adjusted post-test mean difference between low frequency circuit training and medium frequency circuit training group were not significant difference. Low frequency of circuit training group and control group and medium frequency of circuit training group and control group were significant difference.

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 muscular strength.

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