

## EFFECT OF CARDIAC CIRCUIT TRAINING ON SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES OF HIGH SCHOOL BOYS

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### Abstract:

*For this study 30 kabaddi players selected. They subjects were selected from government higher secondary school vadavelli, coimbatore. The subjects age range was 16 to 18 years. They were randomly divided into two equal groups, one group was considered as experimental group and another group as control group. The subject were tested in order to find out physical and physiological variables namely as muscular strength and endurance, speed, agility, breath holding capacity, vo2max. The experimental group participated in specific cardiac circuit training the training was carried out for a period of six weeks and subject were trained three days a week. The data was collected before and after training for period of pre-test, post-test for kabaddi players. The statistical tool used was 't' test. The level of significant for the study was chosen as 0.05. The experimental group after the six weeks training significant improvement in all variables choosed.*

### KEY WORDS:

Cardiac Circuit Training, Physical And Physiological Variables.

### INTRODUCTION

Circuit training method, was developed by R.E. Morgan and G.T. Adamson in 1953 at the university of Leeds England. This type of conditioning involves almost all of the training factors. Circuit training can be designed to develop strength, power, muscular endurance, speed, agility and neuromuscular coordination, flexibility and cardiovascular endurance. Circuit training combines a number of different components of training, thus total fitness is emphasized. It provides an interesting training environment for the athlete, and there are established times and levels to motivate the athlete to continue improving. It can be adapted within the time constraints of the individual. In circuit training progression in all activities is assured. Circuit training is an excellent way to simultaneously improve mobility and build strength and stamina. The circuit training format utilizes a group of 6 to 10 strength exercises that are completed one exercise after another. Each exercise is performed for a specified number of repetitions or for a given time period before moving on to the next exercise.

There are numerous benefits to incorporating a healthy cardiovascular related training routine. Many people's workout regimen only involves a routine of lifting weights a few days a week. The term cardiovascular can be defined as the body's ability and efficiency to get blood and oxygen to the muscles. The amount of time spent on cardiovascular exercises will vary according to your specific goals. For an individual attempting to further their heart health, without specifically gaining or losing weight, a general guideline would be to perform cardio a minimum of 30 minutes a day, 3 days a week. Circuit training is a type of interval training program which combines components of both strength training and cardiovascular

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training. It is often a set up of stations or 'circuits' which individuals will complete before moving onto the next. Within each circuit participants will perform exercises for a specific count or a specific time period before they venture to the next station. The goal of circuit training is to increase strength and agility at the same time as increasing fitness. Some studies have even found that circuit training is the most efficient way to enhance cardiovascular training and muscle endurance.

**SELECTION OF VARIABLES**

**TABLE - I**

**1. Physical variables**

S.No	Variables	Test
1	Muscular strength and endurance	Sit-ups
2	Speed	50 mts dash
3	Agility	Shuttle run

**2. Physiological variables**

S.No	Variables	Test
1	Breath holding capacity	Timing
2	Vo2 Max	Bench step test

**TABLE – II  
COMPUTATION OF 't'- RATIO BETWEEN PRE AND POST TEST MEANS OF  
EXPERIMENTAL & CONTROL GROUP ON MUSCULAR STRENGTH ENDURANCE**

Variable	Group		Mean	Std. deviation	Std-Error mean	't'- ratio
<b>Muscular strength endurance</b>	Experimental group	Pre	37	34.88	5.71	<b>6.24*</b>
		Post	48	47.48	6.21	
	Control group	Pre	35	33.70	51.71	0.59
		Post	34	34.81	5.81	

Table II shows that the muscular strength endurance of experimental group mean values. The mean value of pre and post test 37 and 48 respectively, the “calculated” value 6.24 is greater than the required table value of 2.14 for 0.05 level of confidence. Hence there was significant difference on muscular strength endurance between the pre and post test on experimental group. The mean value of pre and post test on control group is 35 and 34 respectively, the “calculated” value 0.59 is lower than the required table value of 0.05 level of confidence. Hence there was no significant difference on muscular strength endurance between pre and post test on control group.

**TABLE – III**  
**COMPUTATION OF 't'- RATIO BETWEEN PRE AND POST TEST MEANS**  
**OF EXPERIMENTAL & CONTROL GROUP ON SPEED**

Variable	Group		Mean	Std. deviation	Std- Error mean	't'-ratio
Speed	Experimental group	Pre	8.14	0.49	0.0447	7.24*
		Post	7.84	16.94	1.483	
	Control group	Pre	7.73	7.48	2.6908	0.70
		Post	7.70	27.76	10.08	

Table III shows that the speed of experimental group mean values. The mean value of pre and post test 8.14 and 7.84 respectively, the “calculated” value 7.24 is greater than the required table value of 2.14 for 0.05 level of confidence. Hence there was significant difference on speed between the pre and post test on experimental group. The mean value of pre and post test on control group is 7.73 and 7.70 respectively, the “calculated” value 0.70 is lower than the required table value of 0.05 level of confidence. Hence there was no significant difference on speed between pre and post test on control group.

**TABLE – IV**  
**COMPUTATION OF 'T' RATIO BETWEEN PRE AND POST TEST MEANS OF**  
**EXPERIMENTAL & CONTROL GROUP ON AGILITY**

Variable	Group		Mean	Std. deviation	Std- Error mean	't'-ratio
agility	Experimental group	Pre	11.89	10.196	3.09	4.78*
		Post	11.42	43.158	12.17	
	Control group	Pre	11.16	15.70	48.26	0.73
		Post	11.21	28.08	8.91	

Table IV shows that the agility of experimental group mean values. The mean value of pre and post test 11.89 and 11.42 respectively, the “calculated” value 4.78 is greater than the required table value of 2.14 for 0.05 level of confidence. Hence there was significant difference on agility between the pre and post test on experimental group. The mean value of pre and post test on control group is 11.16 and 11.21 respectively, the “calculated” value 0.73 is lower than the required table value of 0.05 level of confidence. Hence there was no significant difference on agility between pre and post test on control group.

**TABLE – V**  
**COMPUTATION OF 't'- RATIO BETWEEN PRE AND POST TEST MEANS**  
**OF EXPERIMENTAL & CONTROL GROUP ON BREATH HOLD CAPACITY**

Variable	Group		Mean	Std. deviation	Std- Error mean	't'-ratio
<b>Breath hold</b>	Experimental group	pre	0.514	1.93	2.692	<b>3.89*</b>
		Post	3.96	0.65	0.33	
	Control group	Pre	3.162	12.16	1.76	0.04
		Post	0.421	6.09	1.54	

Table V shows that the breath hold capacity of experimental group mean values. The mean value of pre and post test 0.514 and 3.96 respectively, the “calculated” value 3.89 is greater than the required table value of 2.14 for 0.05 level of confidence. Hence there was significant difference on breath hold capacity between the pre and post test on experimental group. The mean value of pre and post test on control group is 3.162 and 0.421 respectively, the “calculated” value 0.04 is lower than the required table value of 2.14 for 0.05 level of confidence. Hence there was no significant difference on breath hold capacity between pre and post test on control group.

**TABLE – VI**  
**COMPUTATION OF 't'- RATIO BETWEEN PRE AND POST TEST MEANS**  
**OF CONTROL GROUP ON VO<sub>2</sub> MAX**

Variable	Group		Mean	Std. deviation	Std- Error mean	't'-ratio
<b>Breath hold capacity</b>	Experimental group	pre	131.86	15.27390	0.44399	<b>10.13*</b>
		Post	127.36	16.02903		
	Control group	Pre	133.93	14.84154	0.83450	0.87
		Post	134.66	14.49455		

Table VI shows that the vo<sub>2</sub> max of experimental group mean values. The mean value of pre and post test 131.86 and 127.36 respectively, the “calculated” value 10.13 is greater than the required table value of 2.14 for 0.05 level of confidence. Hence there was significant difference on vo<sub>2</sub> max between the pre and post test on experimental group. The mean value of pre and post test on control group is 133.93 and 134.66 respectively, the “calculated” value 0.87 is lower than the required table value of 2.14 for 0.05 level of confidence. Hence there was no significant difference on vo<sub>2</sub> max between pre and post test on control group.

## CONCLUSION

On the basis of the interpretation of the data, following conclusion to draw from the study. Six weeks practice of cardiac circuit training programme improved the selected physical and physiological

variables such as muscular strength and endurance, speed, agility, breath holding capacity, vo<sub>2</sub> max.

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