

# Effect of Interval Training with Varied Intensities on Selected Performance related Physical Fitness Variables among handball Players



## PHYSICAL EDUCATION

**KEYWORDS :** Intensity, Interval training, Speed, Cardio respiratory endurance and Handball.

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### ABSTRACT

The purpose of the study was to find out the effect of interval training with varied intensities on speed and cardio respiratory endurance among handball players. To achieve this purpose sixty male handball players were selected as subjects randomly from various places of Cuddalore District, Tamilnadu. The selected subjects were divided into four equal groups of fifteen subjects each, namely low, moderate and high intensity interval training groups and control group. Experimental groups were trained for three alternative days in a week for twelve weeks with 50 – 65%, 65 – 80% and 80 – 95% of intensity for low, moderate and high intensity interval training groups. Speed and cardio respiratory endurance were selected as criterion variables and they were tested prior to and immediately after the training programme by using 50 meters dash and cooper's 12 minutes run/ walk test respectively. The ANCOVA was applied to find out the significant difference in each criterion variables, if any, among the groups. Since, four groups were compared, whenever the obtained 'F' ratio for the adjusted post test means was found to be significant, the Scheffe's post hoc test was applied to determine the paired mean differences, if any, was used. The results of the study revealed that there was a significant improvement on speed and cardio respiratory performance due to low, moderate and high intensity interval training groups as compared to control group.

### INTRODUCTION

Handball is the most aggressive sport in the world. Handball is complex and demanding game requiring sophisticated training. Interval training is one of the training very commonly used among the handball players for the development of motor fitness. An activity can be carried out with different intensities, which will have different effect on the organism. The role of varied intensities of interval training needs further research to clarify the dispute in its effect on handball players.

The purpose of the study was to find out the effect of interval training with different intensities on speed and cardio respiratory endurance among handball players. The investigation framed the following hypotheses: there may be significant improvement on speed and cardio respiratory performance due to twelve weeks of low, moderate and high intensity interval training as compared to control group and also there may be a significant difference on speed and cardio respiratory endurance among low, moderate and high intensity interval training groups.

### METHODOLOGY

	Test	Low Intensity Interval Training Group	Moderate Intensity Interval Training Group	High Intensity Interval Training Group	Control Group	Source of Variances	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Speed	Pre-test									
	Mean	7.61	7.63	7.62	7.64	Between	0.01	3	0.003	1.50
	SD	0.04	0.03	0.07	0.03	Within	0.11	56	0.002	
	Post-test									
	Mean	7.24	7.17	7.02	7.64	Between	3.20	3	1.07	356.67*
	SD	0.07	0.06	0.06	0.04	Within	0.19	56	0.003	
Adjusted Post-test										
Mean	7.24	7.16	7.02	7.63	Between	2.99	3	1.00	333.33*	
					Within	0.17	55	0.003		
Cardio respiratory endurance	Pre-test									
	Mean	2449.67	2446.00	2448.67	2450.00	Between	147.92	3	49.31	0.11
	SD	10.60	28.98	17.16	23.76	Within	25356.67	56	56452.80	
	Post-test									
	Mean	2841.67	3036.33	2735.67	2468.67	Between	2520731.25	3	840243.75	358.85*
	SD	53.47	46.85	53.28	38.38	Within	131123.33	56	2341.49	
Adjusted Post-test										
Mean	2841.88	3035.83	2735.68	2468.94	Between	2505168.87	3	835056.29	352.84*	
					Within	130167.40	55	2366.68		

To achieve this purpose of the study, sixty male handball players from various places of cuddalore district, Tamilnadu were selected

as subjects at random. The age of the subjects ranged from 16 to 21 years. The selected subjects were divided into four equal groups of fifteen subjects each. Group I underwent low intensity interval training (50-65%), Group II underwent moderate intensity interval training (65-80%), Group III underwent high intensity interval training (80-95%) and Group IV acted as control group. The training programmes three days per week (alternate days) for twelve weeks, 5% of intensity was increased once in three weeks. The Interval trainings were given to three groups at various levels. Speed and cardio respiratory endurance were selected as criterion variables were assessed by using 50 meters dash and cooper's 12 minutes run/walk test respectively. The experimental design was used for the present study was random group design. The analysis of covariance was used to analyse the significant

difference in each criterion variables among the groups. Since, four groups were compared, whenever the obtained 'F' ratio for adjusted post-test means was found to be significant, the Scheffe's test to find out the paired mean differences, if any, was used. The level of significance to test the 'F' ratio obtained by the analysis of covariance was 0.05, which was considered appropriate.

### RESULTS

The data collected prior to and after the experimental period on speed and cardio respiratory endurance of low intensity interval training group, moderate intensity interval training group, high intensity interval training group and control group were analysed and presented in Table-I.

TABLE-1:-Analysis of covariance of data on speed and cardio respiratory endurance between pre and post test of low intensity interval training group, moderate intensity interval training group, high intensity interval training group and control group

\* Significant at .05 level of confidence.

The table value required for significance at .05 level with df 1 and 56 & 1 and 55 are 2.772 and 2.775 respectively.

Table-1 shows that the obtained "F" ratio value 333.33 for adjusted post test mean values on speed which was greater than the required table value of 2.775 for significance with df 3 and 55. The results of the study showed that there was a significant difference among four groups on speed.

Table-1 also shows that the obtained "F" ratio value 352.84 for adjusted post test mean values on cardio respiratory endurance which was greater than the required table value of 2.775 for significance with df 3 and 55. The results of the study showed that there was a significant differences among four groups on cardio respiratory endurance. Since four groups were involved, the Scheffe's post hoc test was applied to find out the paired mean differences, if any, and it is presented in the Table - 2.

TABLE- 2:- Scheffe's post hoc test for the difference between six paired adjusted post test means of speed and cardio respiratory endurance

	S. No.	Low Intensity Interval Training Group	Moderate Intensity Interval Training Group	High Intensity Interval Training Group	Control Group	Mean Difference	Confidence Interval
Speed	1.	7.24	7.16	-	-	0.08*	0.059
	2.	7.24	-	7.02	-	0.22*	0.059
	3.	7.24	-	-	7.63	0.39*	0.059
	4.	-	7.16	7.02	-	0.14*	0.059
	5.	-	7.16	-	7.63	0.47*	0.059
	6.	-	-	7.02	7.63	0.61*	0.059
Cardio respiratory endurance	1.	2841.88	3035.83	-	-	193.95*	51.25
	2.	2841.88	-	2735.68	-	106.20*	51.25
	3.	2841.88	-	-	2468.94	372.94*	51.25
	4.	-	3035.83	2735.68	-	300.15*	51.25
	5.	-	3035.83	-	2468.94	566.89*	51.25
	6.	-	-	2735.68	2468.94	266.74*	51.25

\*Significant at 0.05 level of confidence.

TABLE -2 shows that the adjusted post test mean difference between low intensity interval training group and moderate intensity interval training group, low intensity interval training group and high intensity interval training group, low intensity interval training group and control group, moderate intensity interval training group and high intensity interval training group, moderate intensity interval training group and control group and high intensity interval training group and control group were 0.08, 0.22, 0.39, 0.14, 0.47 and 0.61 for speed and 193.95, 106.20, 372.94, 300.15, 566.89 and 266.74 for cardio respiratory endurance respectively. They were greater than the confidence interval value of 0.059 and 51.25 at .05 level which indicates that there was a significant difference among above said six paired groups on speed and cardio respiratory endurance.

## DISCUSSION

The result of the study indicates the low, moderate and high intensity interval training had significantly improved on speed and cardio respiratory endurance. The result of the study in consonance with the findings of Brown et al. (1986) conducted a study to find out the effect of interval exercise on 15 year old subjects in which interval group experienced significant gain in speed. Bompá (1996) experimented and suggested that interval exercise can often yield a significant gain in starting power and accelerating power during sprinting performance. Cronin J. B et al. (2005) the plyometric training involving countermovement and loaded jump-squat training may be more effective for enhancing sport speed in elite players. Dupont et al. (2004) high-intensity interval training have shown decreased maximal aerobic endurance. Hoff (2005) heart's stroke volume is the element in the oxygen chair that mainly improved aerobic endurance performance. Spurrs and Others (2003) interval programme lead to improvements in 3 km endurance performance. These studies are positively related with result of the present study.

## CONCLUSION

1. There was a significant improvement on speed and cardio respiratory endurance due to 12 weeks of low, moderate and high intensity interval training.
2. High intensity interval training significantly improved speed as compared to low intensity interval training and moderate intensity interval training.
3. Moderate intensity interval training significantly improved cardio respiratory endurance as compared to low intensity interval training and high intensity interval training.

## REFERENCE

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