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Effect of intensive interval training on resting heart rate and breath holding time among kabaddi players

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Abstract

The primary aim of this study is to find out the effect of intensive interval training on resting heart rate and breath holding time among Kabaddi players. To achieve the purpose, 24 Kabaddi players were selected from Thoothukudi District Kabaddi players and their age ranged from 18 to 24 years. The subjects were randomly divided into two groups with 12 subjects each namely experimental and control groups. Experimental group underwent intensive interval training programme three alternative days in a week for period of 6 weeks. Resting heart rate and breath holding time were selected as dependent variables. Pre and post tests randomized control group design was used as experimental design. The collected data from the subjects were analyzed with dependent t- test and analysis of covariance (ANCOVA). It was concluded that the resting heart rate and breath holding time had significantly improved due to 6 weeks of intensive interval training and control group didn't produced any changes on selected dependent variables.

Keywords: Intensive Interval training, Resting heart rate and breath holding time

Introduction

Interval training in endurance events has been well established as a means of increasing performance in both trained and untrained athletes (Laursen and Jenkins, 2002; Laursen, *et al.*, 2002; Stepto *et al.*, 1999) [4, 5, 7]. Advances in technology have led to the availability of more affordable training aids such as heart rate monitors and power meters. Both laboratory-based and portable devices have been used to measure or demonstrate improvements in key physiological variables following interval-based training (Ebert *et al.*, 2006; Stepto *et al.*, 1999) [1, 7]. The intensive interval method uses slightly higher resistance (50 to 60 percent) for shorter duration (average of 30 seconds) and three to six sets per exercise. The authors list no target heart rate for this method, but they do mention that set performance should be explosive for each repetition. In this method, we're less concerned with the number of reps and using time as our guide (Hartmann & Tunnemann 1995).

Singh (1991) [6] stated that, "In interval training the work should be done with sufficient speed and duration so that heart rate goes up to 180 beats per minute. After words there should be a recovery period and when the heart beat comes down to 120 130 beats per minute, work should be started again". A worldwide continuous running, interval training, shuttle run and interval training methods are used to improve the endurance ability of team game players but in India, specifically continuous running and interval training methods are more common and applied extensively by soccer coaches during preparatory period to improve the endurance ability of players.

Statement of the problem

The purpose of the study is to find out the effect of intensive interval training on resting heart rate and breath holding time among Kabaddi players.

Methodology

To achieve this purpose, 24 Kabaddi players were selected randomly from Thoothukudi District Kabaddi players and their age ranged 18 to 24 years. The selected subjects were divided into two groups with 12 subjects each namely experimental and control groups.

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The experimental group underwent the intensive interval training three alternative days per week for a period of six weeks and the control group did not take part in any specific training. The pretest was taken prior to the training programme and post test was taken after the six weeks of training period. As per availability literature and the personal knowledge of the investigator following variables were be chosen for this study such as resting heart rate and breath holding time. Radial pulse method and nostril clip method tests were used to measure the selected variables such as resting heart rate and breath holding time respectively.

The collected data from two groups were statistically analyzed. Dependent t-test was used to find out the significant improvement between the pre and post test means and analysis of covariance (ANCOVA) was used to find out the significant difference between the adjusted post test means of experimental and control groups. In all cases the criterion for statistical significance was set at 0.05 level of confidence and SPSS 20.0 was used for analysis.

Analysis of Data

Table 1: The summary of mean and dependent t-test for the pre and post tests on resting heart rate and breath holding time of experimental and control groups

Tests	Resting heart rate				Breath holding time			
	Experimental group		Control Group		Experimental group		Control Group	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre Test	74.33	2.74	74.92	2.43	43.17	2.29	43.92	2.31
Post Test	67.67	1.23	74.33	1.56	48.58	2.81	44.08	2.50
t-test	12.31*		1.40		13.00*		0.41	

*Significant at .05 level of confidence. (The table value $t_{11}=2.20$)

The table 1 shows that the obtained dependent t-test values between pre-test and post test means of experimental and control groups on resting heart rate are 12.31 and 1.40 and breath holding time are 13.00 and 0.41 respectively. The table value required for significant difference with df 11 at .05 level is 2.20. Since, the obtained t-test value of experimental group is greater than the tabulated t - value, it is concluded that

intensive interval training programme had significantly improved the performance of resting heart rate and breath holding time and the control groups has not improved because they were not subjected to any specific training. The pre and posttest means of experimental and control groups on resting heart rate and breath holding time were graphically represented in figure 1 & 2.

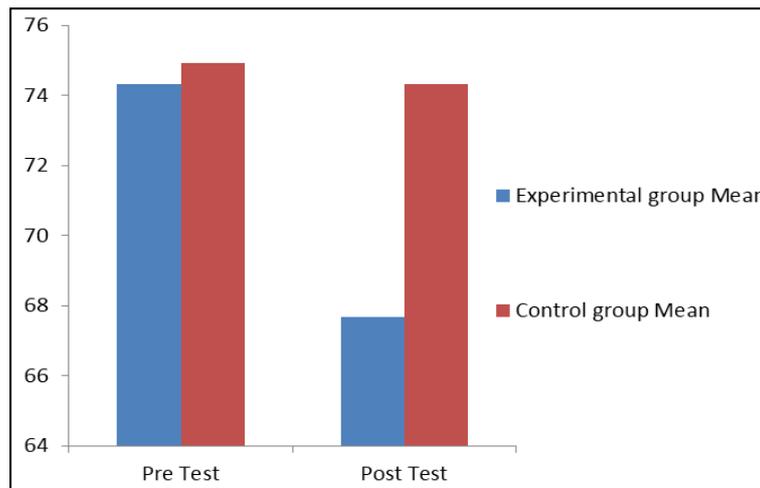


Fig 1

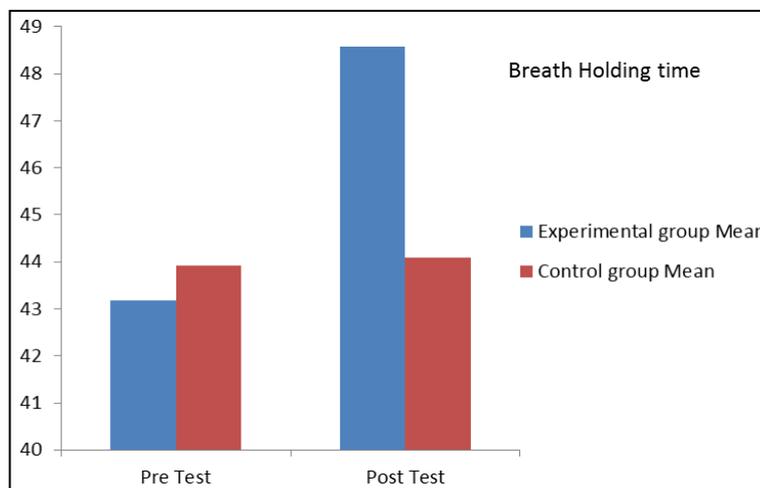


Fig 2

The analysis of covariance on resting heart rate and breath holding time of experimental and control groups have been analyzed and presented in table 2.

Table 2: Analysis of covariance on resting heart rate and breath holding time of experimental and control groups

variables	Adjusted Post Test Means		Source of Variance	Sum of Square	df	Mean Square	F-ratio
	Experimental Group	Control Group					
Resting heart rate	67.79	74.21	Between	243.25	1	243.25	350.58*
			Within	14.99	21	0.71	
Breath holding time	48.95	43.72	Between	159.67	1	159.67	75.31*
			Within	44.52	21	2.12	

*Significant at .05 level of confidence. (The table value $F_{(1,21)}=4.32$)

Table 2 shows that the obtained F-ratio value of resting heart rate is 350.58 and breath holding time is 75.31 which are higher than the table value of 4.32 with df 1 and 21 required for significance at .05 level. Since, the value of F-ratio is higher than the table value it indicates that there was significant difference exists between the adjusted post-test means of experimental and control groups on resting heart rate and breath holding time.

Discussion on Findings

The result of the study indicated that, the experimental group had achieved significant improvement on resting heart rate and breath holding time when compared to the control group. Significant differences were found between experimental and control groups towards improving the selected variables such as resting heart rate and breath holding time among Kabaddi player.

The results from this study were parallel with the results reported in the literature. Some evidence suggests that according to Laursen, P. B., & Jenkins, D. G. (2002)^[4], the scientific basis for high-intensity interval training and it's was concluded that examine of the biochemical and physiological adaptations which accompany different HIT programmes, as well as investigation into the optimal HIT programme for eliciting performance enhancements in highly trained athletes is required.

Conclusions

From the analysis of the data the following conclusions were drawn:

1. The intensive interval training group has achieved significant improvement on resting heart rate when compared to the control group due to the intensive interval training.
2. The intensive interval training has achieved significant improvement on breath holding time when compared to the control group due to the intensive interval training.
3. The intensive interval training and control groups have significant difference on resting heart rate and breath holding time among Kabaddi players.

Recommendation for Future Research

1. It is recommended that further research be designed to investigate the effects of training programmes based on gender.
2. It is recommended that further research be undertaken to investigate the effects of training on rural and urban population.
3. It is recommended that further research be conducted to investigate the effects of training on both trained subjects.
4. It is recommended that further research be conducted using more strenuous training programs.

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