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Efficacy of extensive interval training on VO_2 max of untrained college students

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Abstract

The purpose of the study was to find out the efficacy of extensive interval training on VO_2 Max among untrained college male students. To achieve the purpose of the study, thirty untrained men students were selected as subjects. The age, height and weight of the subjects ranged from 18 to 22 years, 162 to 175 centimetres and 56 to 70 kilograms respectively. The selected subjects were randomly assigned into two equal groups of 15 subjects each. Group I underwent extensive interval training, group II acted as control. The collected data analysed by analysis of covariance (ANCOVA) to determine the significant differences. The result of the study showed that significant differences exist among the adjusted post test means of experimental and control groups on VO_2 Max.

Keywords: Extensive interval training and vo_2 max

Introduction

The extensive interval training constitutes the intermittent variation of exertion and active recovery periods within a training unit. Characteristics of the extensive interval method are medium or large exertion periods within the basic endurance range or within the strength endurance range with the duration of the recovery periods being half as long as those of the exertion periods. It is important to note that the recovery periods must not result in full recovery. In the extensive interval method, the athlete will perform approximately 20 to 30 repetitions for one set, with the duration of that set lasting 60 seconds with weights of 30 to 40 percent of max. Three to six sets are performed with each exercise, with the goal being to reach a target heart rate of between 150 to 180 beats per minute minus your age. The example they give is that a 20 year old athlete should reach heart rates of 130 to 160 beats per minute during the set (Hartmann and Tunnemann, 1995) [1].

Interval training can improve many aspects of human physiology. In athletes, it can enhance lactate threshold and increase VO_2 max. Lactate threshold has been shown to be a significant factor in determining performance for long distance running events. An increase in an athlete's VO_2 max allows them to intake more oxygen while exercising, enhancing the capability to sustain larger spans of aerobic effort. Studies have also shown interval training can induce endurance-like adaptations, corresponding to increased capacity for whole body and skeletal muscle lipid oxidation and enhanced peripheral vascular structure and function (Mazurek and others, 2014).

Methodology

The purpose of the study was to find out the efficacy of extensive interval training on VO_2 Max among untrained college male students. To achieve the purpose of the study, thirty untrained men students were selected as subjects. The age, height and weight of the subjects ranged from 18 to 22 years, 162 to 175 centimetres and 56 to 70 kilograms respectively. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the sprint training programme. The selected subjects were randomly assigned into two equal groups of 15 subjects each. Group I underwent extensive interval training, group II acted as control. VO_2 Max was measured by the one mile run and walk test. The collected data analysed by analysis of covariance (ANCOVA) to determine the significant differences.

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Training programme

In this study, training was done under close supervision with frequent adjustments in training intensity to maintain the desired training stimulus. The training programmes were scheduled for one session a day each session lasted between thirty to forty five minutes approximately including warming up and warming down. During the training period, the experimental group underwent extensive interval training

programme three days per week (alternative days) for twelve weeks in addition to their curriculum. The group-I concentrated on extensive interval training, Intensity starting from @ 70% of HRR to @ 95% HRR, followed from first week to twelve weeks.

Result

Table 1: Analysis of covariance on VO₂ max of experimental and control groups

	Extensive Interval Training	Control Group	S O V	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean SD	2.74	2.67	B	0.036	1	0.036	0.51
	0.29	0.23	W	2.01	28	0.072	
Post test Mean SD	3.01	2.74	B	0.53	1	0.536	18.56*
	0.13	0.19	W	0.81	28	0.028	
Adjusted Post test Mean	3.01	2.75	B	0.48	1	0.48	17.40*
			W	0.74	27	0.03	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20.) *Significant at .05 level of confidence

Table shows that the pre-test means and standard deviation VO₂ Max of extensive interval training and control groups are 2.74 ± 0.29 and 2.67 ± 0.23 respectively. The obtained 'F' ratio value is 0.51 of VO₂ Max was less than the required table value of 4.20 for the degrees of freedom 1 and 28 at 0.05 level of confidence.

The post-test means and standard deviation on VO₂ Max of extensive interval training and control groups are 3.01 ± 0.13 and 2.74 ± 0.19 respectively. The obtained 'F' ratio value is 18.56 of VO₂ Max was greater than the required table value of 4.20 for the degrees of freedom 1 and 28 at 0.05 level of confidence.

The adjusted post test means on VO₂ Max of extensive interval training and control groups are 3.01 and 2.75 respectively. The obtained 'F' ratio value of 17.40 on VO₂ Max were greater than the required table value of 4.21 for the degrees of freedom 1 and 27 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted post test means of experimental and control groups on VO₂ Max.

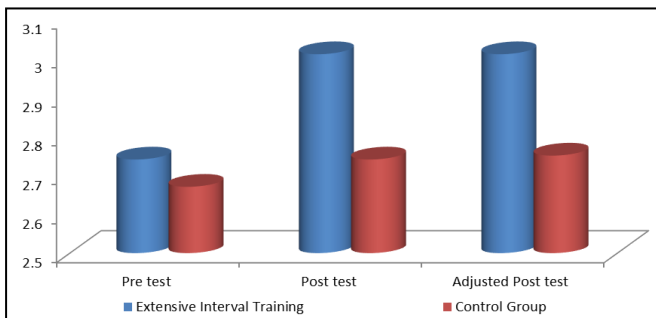
3-week high-intensity interval training on VO₂ max, total haemoglobin mass, plasma and blood volume in well-trained athletes. Result of the study showed that after the training VO₂ max improved from baseline of the subjects. Marta, *et al.*, (2013) [2] examined the effects of Two Weeks of High-intensity Interval Training (HIIT) on Monocyte TLR2 and TLR4 Expression in High BMI Sedentary Men. Result showed that two weeks of high-intensity intermittent exercise training increased VO₂peak. Skutnik and others (2016) [3] examined the effect of low volume interval training on resting blood pressure in pre-hypertensive subjects: A Preliminary Study. They suggested that HIIT and ET similarly decreased resting blood pressure and increased VO₂max.

Conclusion

The result of the study showed that significant differences exist among the adjusted post test means of experimental and control groups on VO₂ Max. Moreover extensive interval training group had high impact to increase the VO₂ Max of the subjects.

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Cylinder diagram showing the mean value on VO₂ max of experimental and control groups

Discussion and conclusion

The finding of the study stated that significant differences exist among the adjusted post test means of experimental and control groups on VO₂ Max. Moreover extensive interval training group had high impact to increase the VO₂ Max of the subjects. The following studies are supporting my finding of the study. Verena, *et al.*, (2015) [4] conducted the effect of