International Journal of
PHYSICAL EDUCATION, FITNESS AND SPORTS

FULL LENGTH ARTICLE

EFFECT of isolated and combined interval and continuous running on VO_2 max

Received 17th January 2017
Accepted 26th February 2017

www.ijpefs.com

DOI:10.26524/2017301

R. Karthikeyan[a, *]

[a] Department of Physical Education and Sports & Sciences, Annamalai University, Chidambaram, Tamil Nadu. India.
*Corresponding Author Ph: +91 9842012154; Email: karthi_pe@yahoo.co.in

Abstract: The purpose of the study was to find out the effect of isolated and combined interval and continuous running on VO_2 max. For the purpose of the study forty students from the department of Physical Education and Sports Sciences, Annamalai University, TN were as selected. The subjects were aged between 18 to 23 years. The subjects chosen for the study were divided into four equal groups as called three experimental groups and one control group, each group consists of ten students. The data collected from the four groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since four groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all the cases level of confidence was fixed at 0.05 for significance. The results the effects of isolated and combined interval have significantly contributed to improving on VO_2 max.

Keywords: Isolated and combined interval and continuous running and Vo_2 max.

Introduction

Interval training is a type of discontinuous physical training that involves a series of low- to high-intensity exercise workouts interspersed with rest or relief periods [1]. The high-intensity periods are typically at or close to anaerobic exercise, while the recovery periods involve the activity of lower intensity. Some experts believe aerobic interval training may benefit exercisers by allowing them to burn more calories in a shorter period of time, and by improving aerobic capability at a faster rate. Interval training can be an effective means of enhancing an athlete's lactate threshold. Lactate threshold has been shown to be a significant factor determining performance for long distance running events.

Running is a type of gait characterized by an aerial phase in which all feet are above the ground. This is in contrast to walking, where one foot is always in contact with the ground, the legs are kept mostly straight and the center of gravity vaults over the stance leg or legs in an inverted pendulum fashion. A characteristic feature of a running body from the viewpoint of spring-mass mechanics is that changes in kinetic and potential energy within a stride occur simultaneously, with energy storage accomplished by springy tendons and passive muscle elasticity [2]. The term running can refer to any of a variety of speeds ranging from jogging to sprinting. Continuous training is a type of physical training that involves activity without rest. This type of training may be of high intensity, of moderate intensity with an extended duration, or fartlek training [3]. Continuous training means the pe Continuous training can be broken down into the following sub-divisions that have slightly different effects upon the energy pathways. Running like all forms of regular exercise can effectively slow or reverse the effects of aging [4].

Methodology

The purpose of the study was to find out the effect of isolated and combined interval and continuous running on VO_2 max. For the purpose of the study forty students from the department of Physical Education and Sports Sciences, Annamalai University, TN were as selected. The subjects were aged between 18 to 23 years. The subjects chosen for the study were divided into four equal groups called three experimental groups and one control group, each group consists of ten students.

Training Protocol

The experimental groups consist of three groups. Group – I subjects underwent interval training progamme for three days a week for eight weeks. The intensity of training during the first week of training was fixed at 45% of HRR. The training load was progressively increased once in two weeks for 5%. Group – II subjects underwent continuous running progamme for three days a week for eight weeks. The intensity of training during the first week of training was fixed at 45% of HRR. The training load was progressively increased once in two weeks for 5%, the duration of running from 20 minutes to 30 minutes. Group – III subjects underwent combined interval training and continuous running progamme for three days a week for eight weeks. Alternate weeks they performed the both training, every odd number of weeks they performed interval training and every even number of weeks they performed continuous running. The intensity of training during the first week of training was fixed at 45% of HRR. The training load was progressively increased once in two weeks for 5%. Group – IV acted as a control.

Statistical Analysis

The data collected from the four groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since four groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. In all the cases level of confidence was fixed at 0.05 for significance.

Results

Table – 1

Analysis of covariance on VO_2 max of experimental and control groups

	Interval Training	Continuous Running	Combined Training	Control Group	SOV	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean SD	2.80	2.88	2.87	2.91	B	0.06	3	0.02	0.46
	0.18	0.14	0.28	0.19	W	1.57	36	0.04	
Post test Mean SD	3.10	3.35	3.19	2.85	B	1.30	3	0.43	7.32*
	0.25	0.16	0.17	0.33	W	2.13	36	0.05	
Adjusted Posttest Mean	3.11	3.35	3.19	2.84	B	1.33	3	0.44	7.58*
					W	2.05	35	0.05	

*Significant at .05 level of confidence

(The required table value for significance at 0.05 level of confidence with degrees of freedom 3 and 36 is 2.87 and degree of freedom 3 and 35 is 2.87.)

Table – 2

Scheffe's test for the difference between the adjusted post test paired means of isolated and combined interval and continuous running group with different tests on VO_2 max

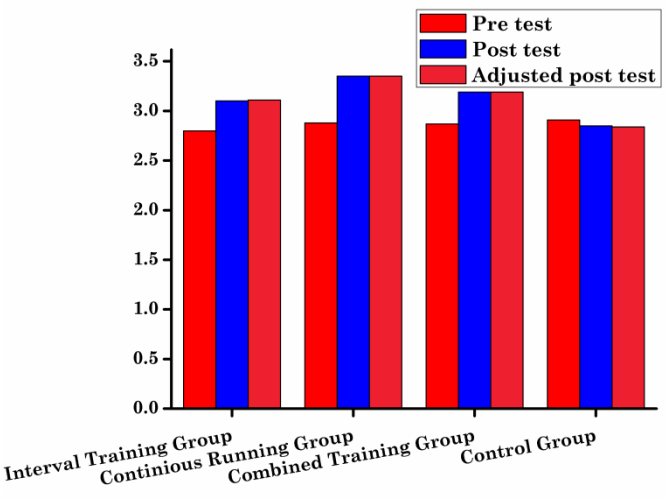
Interval Training Group	Continuous Running Group	Combined Training Group	Control Group	Mean difference	Confidence interval
3.11	3.35			0.24*	0.23
3.11		3.19		0.08	0.23
3.11			2.84	0.27*	0.23
	3.35	3.19		0.16	0.23
	3.35		2.84	0.51*	0.23
		3.19	2.84	0.35*	0.23

*Significant at .05 level of confidence

In table 1 it was found from the result of this study that significant differences existing between experimental and control groups, since the obtained 'F' ratio value of adjusted post test means of 7.58 on VO_2 max was greater than the required table value of 2.87 for degrees of freedom 3 and 35 at 0.05 level of confidence. Hence it was concluded that due to the effect of eight weeks of isolated and combined interval and continuous running the Vo_2 max of the subjects was significantly increased.

Table-2 shows results that there is a significant difference between the adjusted post test means of interval training group and continuous running group; interval training group and control group; continuous running group and control group; combined training group and control group. Also, the result of the study reveals that there are no significant differences between interval training group and combined training group; continuous running group and combined training group on VO_2 max.

Figure -1 Cylinder diagram of the data on VO_2 max of



experimental and control groups

Discussions and Conclusion

The result of the study stated that the effect of eight weeks of isolated and combined interval and continuous running had an impact on the VO_2 max of the subjects. Among the experimental groups, continuous running group is better than the other two groups to improve the VO_2 max of the subjects. The following studies are related to my findings. Vivekanand (2010) stated that high intensity interval training is an effective endurance training tool in non-athletic school going male population and provides a better improvement in VO_2 max [5]. Hickson and colleagues (1997) noted that VO_2 max was continuing to increase at the end of the 10 week training program [6].

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