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Effect of high-intensity interval training on selected physical variable among university football players

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Abstract
The training programmes for sports are to be designed that they may favourably affect the speed associated with high performance capacity in that sport. The purpose of the study was to investigate the effect of high-intensity interval training on selected physical variable among university football players. To achieve the purpose of the study, twenty subjects were randomly selected from Vidyasagar University, West Bengal, India. All players participated in the university-level football competition. The age of the subjects ranged from 18-24 years. The subjects (N=20) were divided into two equal groups: Group I (n=10) acted as the control group, and Group II (n=10) acted as the experimental group. Group I underwent regular activity, and Group II underwent high-intensity interval training. The pre-test was administered 8 weeks prior to the post-test, and after the pre-test, the experimental group received high-intensity interval training while the control group maintained their regular activity. An analysis of covariance (ANCOVA) was used to find out the significant difference between the control and experimental groups on a selected physical variable among university football players. The level of confidence was fixed at the 0.05 level to test for significance. From the results of the study, it was concluded that there was a significant difference in speed between the control and experimental groups of university football players.

Keywords: Speed, intensity, interval training, football player

1. Introduction
High-intensity interval training is a well-known, time-efficient training method for improving cardiorespiratory and metabolic function, which in turn improves physical performance in athletes (Buchheit *et al*., 2013) [4]. High-intensity training relative to the individual's maximum oxygen uptake is feasible even in elderly patients with chronic heart failure and severely impaired cardiovascular function (Wisloff *et al*., 2007) [14]. Interval training periods of intense activity interspersed with moderate to low energy expenditure characterize many sports and life activities. High-intensity interval trainingis defined as either repeated short to long bouts of rather high-intensity not maximal-intensity exercise, or short all-out sprints interspersed with a recovery period. Speed plays a vital role in most of the games. All the track events are conducted against time, with speed mostly in the form of acceleration speed, as an important factor. Exercise strengthens the heart muscles. The number of repetitions of exercise should be increased with the person's adaptation to the training, and that increase depends on the distance of the race, the speed attained, and the time taken to recuperate. Therefore, the purpose of this study was to effect of high-intensity interval training on selected physical variable among university football players.

2. Methodology
Twenty (20) active football players were taken as samples and age range between 18 to 24 years. All players were actively competing at Inter-University level in their respected sport and they voluntarily participated in this study. The subjects were randomly divided into two groups, and each group contained 10 subjects. Group I acted as a control group, and Group II acted as an experimental group. Group I underwent regular activity, and Group II underwent interval training for 8 weeks. A pre-test and post-test were given to both groups. The independent variable was selected as speed for interval training. In this study researcher wanted to measure selected physical variable of the selected players.

Variable	Test item	Unit of measure
Speed	60 meter run	Second (s)

Data were collected from both groups before training and after training (8 weeks). Analysis of covariance (ANCOVA) was used to find significant differences between control and experimental groups. In all cases, the confidence level was fixed at 0.05 level which was appropriate.

3. Analysis of data

Table 1: Analysis of Covariance on Speed between Control and Experimental Groups of university Football Players for Pre, Post, and Adjusted Test

Speed		Control Group	Experimental Group	Source of Variance	SS	df	MS	F	Table Value
Pre Test	Mean	7.918	7.842	Between	0.027	1	0.27	2.08	4.41
	S.D.	0.49	0.49	Within	2.403	18	0.13		
Post Test	Mean	7.848	7.252	Between	1.73	1	1.73	21.63*	4.41
	S.D.	0.32	0.32	Within	1.49	18	0.08		
Adjusted Post Test	Mean	7.829	7.829	Between	1.473	1	1.473	29.46*	4.45
				Within	0.82	17	0.05		

*Significant at 0.05 level of confidence.

Table 1 showed that the pre-test mean values of speed for the control and experimental groups were 7.918 and 7.842, respectively. The F value obtained for the pre-test scores for the control and experimental groups on speed was 2.08 less than the required table value of 4.41. It was not significant with a df of 1, 18 at the 0.05 confidence level. The post-test mean values of speed for the control and experimental groups were 7.848 and 7.252, respectively. The obtained F value of 21.63 was higher than the tabulated value of 4.41 for the control and experimental groups in the speed test with df 1, 18 required for a confidence level of 0.05. The adjusted post-test mean values of speed for the control and experimental groups were 7.829 and 7.829, respectively. The F value obtained for the adjusted post-test is 29.46 at the 0.05 level, with a df of 1, 17 higher than the table of 4.45 required for significance.

The speed results of the university football players showed that there was a significant difference between the control and experimental groups through the post-test and adjusted post-test, but there was no significant difference between the pre-test means.

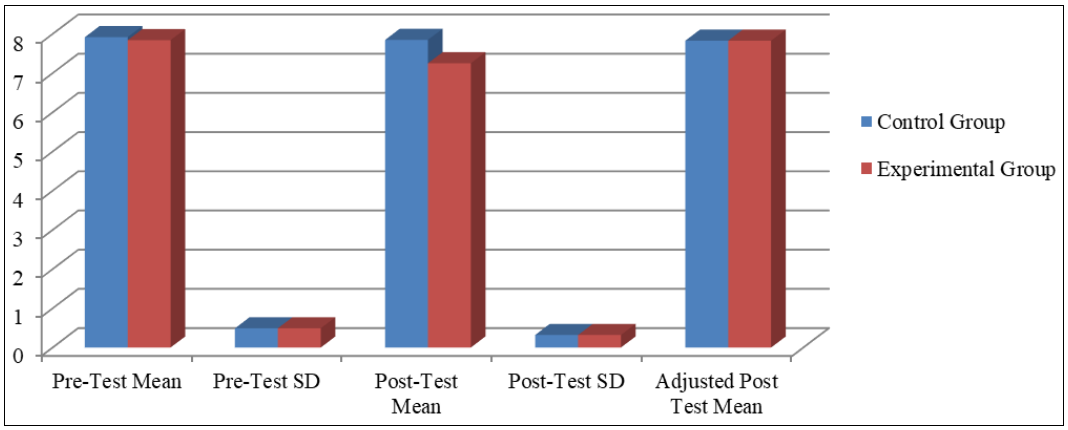

Fig 1: Mean Values of Pre, Post and Adjusted Tests for Control and Experimental Groups on the Speed of University Football Players

4. Discussion

The purpose of the study was to investigate the effect of high-intensity interval training on the speed of university football players. The result of the study showed that there was a significant difference between the control and experimental groups in the speed of university football players. It might be because interval training stimulates several physiological changes that can increase explosive power, speed, and agility. For example, HIIT helps your body learn to burn lactic acid more efficiently, allowing you to exercise for a longer period before fatigue sets in.

5. Conclusion

It was concluded that interval training had significantly improved the speed of the university football players.

6. Recommendations

The same study might be repeated with different variables in different groups, and similar research on female participants could be conducted. In a similar study, a larger sample of subjects may be used.

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