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Effect of interval training method and repetition training method on the performance of 200 meters sprint

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Abstract

The purpose of the study was to see the effect of different training methods on the performance of 200 meters sprinters. Total 30 students (boys) on the basis of random sampling technique of age 16 ± 2 years were selected as a subject from Saraswati Vidya Mandir School, Jhansi (UP). All the students were divided into three different groups' i.e. Experimental group (A), Experimental group (B) and Control group (C). Group A was given the Interval Training, Group B was given Repetition Training and no treatment was given to control Group C. Before and after eight weeks of Training program, the performance of all three groups were recorded up to higher $1/10^{\text{th}}$ of second. Groups "A" and "B" were given treatment in evening session, Monday to Friday. Saturday & Sunday were used for rest and no treatment was given to control Group C. To see the effect of different training program on the performance of 200 meters sprint Analysis of Covariance (ANCOVA) was employed and found significant difference in initial and final scores of 200 meters sprint performance of all the subjects at 0.05 level of significance.

Keywords: interval training, repetitive training.

Introduction

From the earliest time running has been a natural part of a man's existence, whether he was catching animal for food or escaping from predators. However, he also began to run for pleasure and then competitively, leading to a desire to improve on his speed or ability to run farther (Encyclopedia of track and field, 1985)

Running is the most natural of athletics movements. Children run, as part of their play and practically every game require reserves of stamina and the ability to run fast. Every track event has running as its essence, sometime alone, sometime with a team and sometimes between obstacles. Every training and conditioning program contains an element of running, and test of fitness or physical ability always include running for speed (Ekta Gonthi, 1997) [5]

Two hundred meters running may the speed like short distance sprinter, but no means all 100 meters sprinters can compete successfully at 200 meters. In addition to extra distance, there is also a bent that must be negotiated at top speed. It is not a long 400 meters or a short 100 meters, but in an event of the 200 meters, it is also control, balance and poise (Ekta Gonthi, 1997) [5]

The 200 meter runner like the 100 meter athlete must train for greater speed points of technique high-quality sprinting, paying special attention to particular points of technique during repetition runs. In addition he must train over distance repetitions.

Interval training is a good example of progressive overload. It aims at bettering physical endurance, increasing the capacity to respond well to the maximum load. During the past decade, interval training has become one of the most common methods of conditioning for competition in events requiring physical endurance. It has been used by almost all distance runners during the past 10 years including such great athletes as Switzer, Filbert, Bayi, Martin, Liquori and Jim Ryum The interval training approach is used universally for the training of swimming, cyclists and rowers performers well as members of soccer, hockey and basketball teams during preseason conditioning program. Many coaches have contributed much of the tremendous improvement in the performance of endurance event in track & field and swimming to the increased use of interval training by athlete of both sex and all ages and abilities (George B)

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Interval method is perhaps the most versatile method for improving endurance of various types. In interval method, the exercise is done at relatively higher intensity with intervals of incomplete recovery. Interval method is based on the following principle: work should be done with sufficient speed and duration so that the heart rate goes up to 180 beats/ min. after this should be a recovery period and when the heart comes down to 120-130beats/ min. the work should be started again. The training load in interval method, therefore, can be controlled by repeatedly checking the heart rate (Singh Hardyal, 1991) [9].

Procedure

Selection of Subjects

Thirty male students from saraswati Vidya mandir, Jhansi were selected randomly as the subjects for the present study. Subjects were randomly assigned to each of the three group. Age of the students was 16 ± 2 .

Design of the Study

Random group was used for the present study. There were three group namely; Experimental group (A), Experimental group (B), control group (C). Each group consists of ten subjects. The group A was given the interval training programme, group B was given repetition training method and Group C was given no training. Pre test scores were collected for each group before the administration of the training programme. After the eight weeks of training programme post test were collected on each group.

Criterion Measure

The criterion measure chosen for the study was the performance of 200 meters recorded up to higher $1/10^{\text{th}}$ of a second.

Collection of the Data

Data were collected on each subject before and after the training programme (pretest & post test) on 200 meters performance. The command and condition of the test was applied as per Track and field ruled and regulations for the race. The timing was recorded by the manually operated electronic watch up to $1/10^{\text{th}}$ of each subject separately.

Administration of Training Programme

Eight weeks of training programme was administered to know the effect of interval training method and repetition training method on performance of 200 meters sprint. The subjects were divided into three equal groups of 10 each:-

- 1. Interval group (A) 10
 - 2. Repetition group (B) 10
 - 3. Control Group (C) 10
- N 30

The training was given 5 days in a week (from Monday to Friday) to both experimental group and no training was given to the control group. Saturday and Sunday were be utilized for rest and relaxation for both the groups. Entire training programme was administered only in the evening session.

Training Programme for Interval Group (A)

- 1. Work was given 5 times in a week for two months.
- 2. The volume of the work load was less in the preparatory phase and it was increased gradually.
- 3. The repetition distance was 80mts, 100 mts, 120 mts, 150 mts, 200 mts and 250mts.
- 4. For checking the intensity after each load heart rate was considered as a measure of load. The heart rate was kept between 170 to 180 beats/min
- 5. When heart rate was come down at 120-130beats/min the next work load was started again.
- 6. The heart rate was checked at carotid artery for 15 sec. multiplied by 4.

Training Programme for Repetition Group (B)

- 1. Work was given 5 times in a week for two months.
- 2. The volume of the work load was less in the preparatory phase and it was increased gradually.
- 3. The repetition distance was 80mts, 100 mts, 120 mts, 150 mts, 200 mts and 250mts.
- 4. For checking the intensity, heart rate was kept about 180 beats/min and above
- 5. Next work load was given after the complete recovery.

The training was given in evening session to both groups where supervision was made by the research scholar himself. Pretest was taken in second week of November and post test was taken in the second week of January. For both groups, the intensity, recovery and volume were as Shown in table no 01

Table 1: Load Parameters of Interval Training Method and Repetition Training Method

Method	Intensity	Recovery	volume
Interval method	70-80%	incomplete recovery (90-180sec.)	6-10 repetition
Repetition method	90-100%	complete recovery (3-10 min.)	6-10 repetition

Statistical Procedure

To find out the effects of two training methods on the performance of 200 meters, Statistical Package for Social Science (SPSS) version 20 was used. For testing hypothesis the level of significance was set at 0.05 level.

Results

Table 2: The Analysis of Covariance of Interval Group, Repetition group and Control Group for 200 Meters Performance

S. No.	Test	Groups			sum of squares	df	Mean sum of squares	“F”
		Interval training Group (A)	Repetition group method (B)	Controlled Group (C)				
1.	Pre test mean	31.470	31.790	31.320	B 1.152 W 116.525	2 27	B 0.576 W 4.316	0.134
2.	Post test mean	30.080	30.430	31.210	B 6.693 W 80.227	2 27	B 3.347 W 2.971	1.126
3.	Adjusted post test mean	30.12	30.235	31.363	B 9.377 W 16.288	2 26	B 4.688 W 0.626	7.784*

*significance at 0.05 level

F_{.05} (2, 27) 3.35, (2.26) 3.37
 N 30

B Between groups variance

W Within groups' variance

For findings the significance of the differences shown by the groups after the experimental periods of two months, and to find the significance difference between initial and final scores of each treatment and a control group, an analysis of covariance was applied.

The analysis of Covariance of two experimental viz. Interval group, Repetition group and one control group for 200 meters performance has been presented in the table 02

The analysis of covariance for 200 mts sprint performance revealed that the obtained F-ratio value (.134) was not found to be significant in case of pre test means which shows that pretest mean do not differ significantly and the random assignment of the two groups was quite successful.

The post test mean of both groups was not significant as the obtained F value (1.126) is less than the tabulated F value (3.35)

Adjusted post test mean was found to be significant, as the calculated F value (7.784) is higher than the tabulated F value (3.37)

To find out which of the difference between adjusted group means were statistically significant LSD post test was applied as an extension of analysis of covariance. The findings related to this have been presented in the above table.

Table 3: Paired Adjusted Final Means and Difference between Means of Two Experimental and One Control

Group			Mean difference	critical difference
Interval Group (A)	Repetition Group (B)	Control group (C)		
30.122	30.235		0.09	0.71
	30.235	31.363	1.41*	0.71
30.122		31.363	1.50*	0.71

*significant at 0.05 level

Table indicates that groups trained through interval training method and repetition method did not show any significant difference between them (M.D. = 0.09).

Further it was revealed that interval training group is significantly superior to control group (M.d = 1.50) repetition training group was also superior to control group (M.D= 1.41) The findings of table 03 indicate that both the training programme were equally effective in improving the performance of 200 meters sprint.

Discussion of Findings

Analysis of data reveals that the experimental groups trained by interval method and repetition training method improved significantly on the performance of 200 meters sprint whereas the control group did not show any significant improvement.

When the analysis was done for finding out the effect of the two training programme on performance of 200 meters sprint the interval group and repetition group were not shown any significance difference between them and both the training method were found to be equally effective in improving the performance of 200 meters sprint.

Recommendations

In the light of conclusion drawn the following recommendations are made:-

1. Interval training is necessary for all the sports and games according to their nature and need.

2. Interval training and repetition training should be given emphasis for almost all sports and games when different forms of speed are required at the same time.
3. A similar lab study may be conducted by employing sophisticated equipments for measuring various physiological variables.
4. Both training should be given emphasis for the development of speed for every dept. /college of physical education.
5. The present study may be repeated with other subjects then physical education students i.e. students studying in secondary school.

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