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PHYSICAL EDUCATION

EFFECTS LOW INTERSITY AND HIGH INTENSITY RESISTANCETRAINING ON SPEED AMONG SPRINTERS

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Abstract

This study examined the impacts of resistance training with varied intensity on sprint performance among fifteen men sprinters from the Department of Physical Education and Sports Sciences, Annamalai University were selected randomly as subjects. The age of the students ranged from 21 to 24 years. The selected subjects were divided into three groups namely group - I underwent low intensity weight training; Group - II underwent high intensity weight training and group- III acted as control group. The experimental groups were subjected to the training for three days in a week for a period of 8 weeks. The sprint performance was assessed by administering the 100M run test. The Data's were collected from each subject before and after the training period and statistically analyzed by using dependent't' test and analysis of covariance (ANCOVA). It was found that there was a significant improvement on sprint performance due to the effects of weight training programmes.

Keywords: Resistance (Weight) Training, Intensity, Speed, and Sprinters.

INTRODUCTION

There are various sports training activities in the fields of sports. They are strength (or) weight (or) resistance training, interval training, fartlek training, circuit training and so forth. These training are meant for the improvement of specific physical and motor fitness qualities. The main purpose of resistance training is the development of strength parameters. The main components which influence the physical performance of an athlete are strength endurance, power, speed and agility.

Resistance training is the most important ingredient in the process of "making" an athlete and it enhances performance along with success not only in rehabilitation, but also in preventing injuries as well. Proper resistance training yields benefit for any athlete young or old. As a result, he is stronger, faster, more flexible, more enduring and less likely to suffer from injury. Resistance training is used directly to improve maximum strength, elastic strength, strength endurance and it leads to intensive demands on muscles, tendons, ligaments and joints.

Resistance training, also known as strength or weight training is well established as an effective method of exercise for developing muscular fitness (i.e. the ability to generate muscle force). (Hass et al 2001, Fleck and Kraemer 2002) describes the primary goals of resistance training as improving muscular strength and endurance, while other health-related benefits derived from resistance training include, increase in bone mass, reduced blood pressure, increase muscle and connective tissue cross-sectional area (CSA), reduced body fat, and it may relieve low back pain. (Kraemer et al 2002) Although modern technology has reduced much of the need for high levels of force production during activities of daily living, it is recognized in both the scientific and medical communities that muscular strength is a fundamental physical trait necessary for health, functional ability, and enhanced quality of life. There are many sports which are specified and need to combine physical fitness components in order to access optimized performances. Despite development of needed biomotor abilities of each field is special and that's concerned with method training (Bompa, 1999).

Improving our form and endurance also translates into faster overall pace, so strength training is an excellent way to get faster. Runners usually see improvements in their race times fairly soon after they add strength training to their regimens. All it takes is two or three 15- to 20-minute strength-training sessions a week to build more muscle mass. New runners frequently ask, "When will it start to feel easier?" The answer is different for everyone, but adding strength training to your routine can definitely speed up the process. Strengthening your leg muscles will help increase your endurance, meaning you can run longer without feeling fatigued. The purpose of the study was to find out the effects of low and high intensity resistance training on sprint performance among university college men sprinters.

METHODOLOGY

To achieve these purpose fifteen men sprinters were selected from the department of Physical Education and sports sciences, Annamalai University, Chidambaram as subjects. and their age ranged from 18 to 24 years. They were randomly assigned into three

groups of five each such as two experimental and a control groups namely low intensity weight training group (Group-I), high intensity weight training (Group-II) and control group (Group-III). The experimental group I (n=5) underwent low intensity weight training programme, group II (n=5) underwent high intensity weight training programme for 30 to 45 minutes in three alternate days (Monday, Wednesday and Friday) during evening session for eight weeks. Group III (n=5) acted as control and they were asked to refrain from any special training except their leisure time pursuit as college students. The performance variable namely 100M Run was assessed by administering 100M Run test in seconds. The data were collected from each subject before and after the training period and statistically analyzed by paired sample 't' test which was used to find out the significant improvement on selected criterion variable and Analysis of Covariance (ANCOVA) was used to find out the significant difference, if any among the adjusted post test means of experimental and control groups on each variables separately. 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 which of the paired mean differences was significant. All the cases 0.05 level of confidence was fixed as a level of confidence to test the hypotheses.

ANALYSIS OF THE DATA

The influence of varied intensity weight training programmes on 100M Run performance was analyzed and presented in the tables. The mean, standard deviation and dependent 't' test values of 100M Run performance on low intensity weight training group, high intensity weight training group and control group have been analyzed and presented in table I.

TABLE – I
THE SUMMARY OF MEAN STANDARD DEVIATION AND DEPENDENT 't' TEST FOR THE PRE AND POST TESTS OF 100M RUN OF TWO EXPERIMENTAL AND CONTROL GROUPS

Name of the test	Low intensity group	High intensity group	Control group
Pre test mean ± SD	11.78 ± 0.19	11.76 ± 0.21	11.76 ± 0.11
Post test mean ± SD	11.24 ± 0.25	10.88 ± 0.30	11.78 ± 0.13
't' test	**7.96***	**3.96***	0.27*

*Significant at 0.05 level. (The table value required for significant at.05 level of confidence with df 4 is 2.78).

The Table **I** show that the pre-test means value of 100M run performance in low intensity weight training, high intensity weight training and control groups are 11.78, 11.76 and 11.76 and the post test means are 11.24, 10.88 and 11.78 respectively. The obtained dependent t-ratio values between the pre and post test means of low intensity weight training, high intensity weight training and control groups are 7.96, 3.96 and 0.27 respectively. The table value required for significant difference with df 4 at 0.05 level is 2.78. Since, the obtained 't' ratio value of experimental groups are greater than the table value, it is understood that low intensity weight training and high intensity weight training groups have significantly improved the 100M run performance. However, the control group has not improved significantly because the obtained 't' value is less than the table value, as they were not subjected to any specific training. The analysis of covariance on performance of 100M run in low intensity weight training group, high intensity weight training group and control group have been analysed and presented in Table II

TABLE – II
ANALYSIS OF COVARIANCE COMPUTED FOR TWO EXPERIMENTAL AND CONTROL GROUPS ON 100M RUN PERFORMANCE

Variables	Source	SS	Df	MS	F	P	ω^2
Performance of 100M Run	Groups	2.050	2	1.025	**16.65***	.000	0.75
	Error	.677	11	0.062			

(The table values required for significance at .05 level of confidence with df 2 and 11 is 3.98)

The table II shows that the obtained 'F' ratio value of 100M Run performance is 16.65 which are higher than the table value of 3.98 with df 2 and 11 required for significance at 0.05 level. Since the value of F- ratio is higher than the table value, it indicates that there is significant difference between the low intensity weight training group, high intensity weight training group and control group on 100M Run performance. However, only 75% ($\omega^2 = 0.75$) of the total variance was accounted by three groups in 100M Run performance. In order to find out which of the three paired means significantly differ, the Scheffe's post hoc test was applied and presented in the table III.

TABLE - III
SCHEFFE'S POST HOC PAIRED MEANS COMPARISONS AND EFFECT SIZE ON 100M RUN PERFORMANCE OF TWO EXPERIMENTAL AND CONTROL GROUPS

Groups	Adjusted means	Adjusted mean differences (Effect size are indicated in parentheses)		
		1	2	3
Low intensity group	11.24	---		
High intensity group	10.88	0.36	---	
Control group	11.78	**0.54* (2.17)**	**0.90* (3.62)**	---

***Significant at 0.05 level of confidence. Scheffe's C.I value 0.443

Follow-up was conducted to evaluate pair wise differences among the adjusted means for experimental and control groups. The scheffe's procedure was used to control type I error across the three pair-wise comparisons ($\alpha = .05/3 = 0.443$). The results showed that high intensity weight training group (M = 10.88) had significantly better than low intensity weight training group (M = 11.24) and control group (M = 11.78). Low intensity weight training group had better performance over the control group and did not show any significance difference between the experimental groups. The effect size of those significant adjusted mean differences with low intensity weight training group and control group, high intensity weight training group and control groups were 2.17 and 3.62 respectively.

The results of the study show that the selected dependent variable of 100M Run performance has significant difference between the low intensity weight training group and control group, and high intensity weight training group and control group and did not show significance difference between the low intensity weight training group and high intensity weight training group due to the 8 week training programmes. Hence, the researcher's hypothesis was accepted and the null hypothesis was rejected. There are many studies to support of finding of the present study. Tsimahidis et al (2010) have found that 10 week heavy resistance combined with a running training have significantly improved running speed. Maio Alves et al (2010) have concluded CCT induced the performance increase in 5 and 15m sprint and in squat jump it was suggested that the CCT is an adequate training strategy to develop soccer player muscle power and speed. Delecluse et al (1995) have found that high resistance and high velocity training significantly improved the sprint performance. Sole et al (2013) have found that significant effect as well as individual's results. It is possible that HRW protocols could be used as an acute method to improve agility performance in some court sport athletes.

CONCLUSION

1. There was a significant increase in speed for both low intensity resistance training group and high intensity resistance training group as compared to control group.
2. There was significant difference between low intensity resistance training group and high intensity resistance training group in speed.

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