IMPACT OF INTERVAL SPRINT TRAINING ON SELECTED SPEED PARAMETERS OF MALE SPRINTERS

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ABSTRACT

Sprinting can be defined as the ability to run at maximum speed for a short duration. Different modalities of training have been employed in the development of maximum running speed. The purpose of the study was to find out the effect of interval sprint training on speed, stride length and stride frequency among male sprinters. The response to interval sprint training was characterized in thirty male sprinters in the age group of eighteen to twenty years. The selected dependent variables were measured using standard tests and procedures. Analysis of covariance was used to determine the significant difference between pre test and posttest on selected dependent variables. The findings of the study indicate that speed, stride length and stride frequency increased due to eight weeks of interval sprint training. These results suggest that the interval sprint training is an effective means of enhancing the sprinting ability, by bringing out significant changes in speed parameters.

Key words: *Interval sprint training, speed, stride length and stride frequency*

INTRODUCTION

Speed is the measure of how fast an athlete can sprint short distance. A high maximum speed by itself does not guarantee a players success. Quickness refers to the ability of an athlete to perform specific movements in the shortest possible time. It also involves the ability of the nervous system to process rapid contraction and relaxation of the muscle fibre, fast explosive movements of the entire body which occur in starting and acceleration phases of sprinting or of adjusting a body part to start a new movement or rapidly change direction and demonstrate athlete quickness.

Sprinting can be defined as the ability to run at maximum speed for a short duration. Maximum running speed is an important factor for success in many sports. Different modalities of training have been employed in the development of maximum running speed. At present, the standard is high and the competition is so fierce but no sprinter can achieve real success without correct technique and proper training.

Training and technique are very important in developing or improving a sport skill. Generally as the adaptation to training takes place, the efficiency of the skill improves. This can be seen in an improved running style (Martin & Coe, 1991). Speed training, like strength, flexibility and mental skills training have now become an important ingredient in the total programme, particularly where speed of movement is essential in the sport. The aim of sprint training is to condition the athlete to move at high velocity, employing maximal power when needed. In order to do this, the neuromuscular system must be conditioned to very fast movements and training need to be very specific, with a very high anaerobic component.

Physical exercise is extremely important for maintaining physical fitness including healthy weight, building and maintaining healthy bones, muscles and joints, promoting physiological well-being and strengthening the immune system. To improve or maintain a desired level of physical fitness, there is a need to constantly administer an adequate training intensity while exercising. The physiological goal of training is to improve body function and optimize athletic performance. Training is primarily a systematic athletic activity of long duration, which is progressively and individually graded. Human physiological functions are modeled to meet demanding tasks (Bompa, 1999). Training improves the functions of the circulatory, the respiratory and the muscle system. Different training methods have been commonly used to improve physiological fitness and its related standards of performance of the players.

Physical activity causes beneficial changes in the functioning of all internal organs, particularly, the heart, lungs and circulatory system. Studies has proved that exercise is the cheapest preventive medicine and after a period of training there is a slow but consistent reduction in resting heart rate along with an increase in stroke volume. It is a known fact that the slower heart rate and increased stroke volume provide a greater rest for the heart between beats.

Speed of movement in the proper sequence over duration of time is the ultimate object in optimum performance. As strength levels increase and all other biomotor areas have been developed, speed becomes a resultant of the training that has been applied. As the systems are trained, all principles must be adhered to in order for efficient and economical speed development to occur. If the athlete cannot maintain

proper neuromuscular coordination due to physiological energy system fatigue, then the effectiveness of speed is reduced. Development of the biomotor abilities of work capacity, flexibility, co-ordination and strength are necessary in order to ensure that the athlete will be able to maintain speed in all of the sports events.

Interval training was originated in Europe as a scientific method of developing speed and endurance in athletes. It is a method of overloading the athlete by the use of aerobic and anaerobic exercises, thus developing a high oxygen debt. A quick recovery of cardiovascular and respiratory systems is sought for and expected. In this method, an athlete runs a prescribed course in a specified time for a prescribed number of times. Fast runs are interspersed with short recovery periods of jogging. The athlete becomes fatigued many times in a single training session, depending on his ability to handle many states of high oxygen debt. Besides developing speed and endurance, interval training has the added advantage of allowing large numbers of athletes to train at the same time (Novich & Taylor, 1983). To know the efficacy of interval sprint training and its significant contribution to one's level of fitness, it was decided to take up this study.

METHODOLOGY

Subjects and Variables

For the purpose of this study, thirty male sprinters from higher secondary school level from cuddalore, in the age group of 15 to 17 years were recruited, with their consent. The selected dependent variables namely speed, stride length and stride frequency, were assessed using standard tests and procedures, prior to and immediately after the training protocol. Speed was measured by 50 metres run. While the subjects were allowed to run fast about 50 metres to measure speed the measurement of the length of the stride was taken. The average of two stride of the subject was the individual stride length. Stride frequency was calculated by dividing the number of strides taken by the time elapsed gives the number of strides ran in one-second.

Training Protocol

The experimental group underwent the interval sprint training programme for eight weeks. The training distance comprised of 30-50 meters and the initial intensity was fixed at 75% and it was increased once in two weeks by 5%. The subjects performed these runs at maximum relaxed speed with the specified intensity. The rest interval between repetitions was 2 minutes, where they stay active and between sets they performed other balance or trunk activities for 5 minutes. The control group did not participate in any specialized training during the period of study.

Experimental Design and Statistical Procedure

The experimental design used for the present investigation was random group design involving thirty subjects. Analysis of covariance (ANCOVA) was used as a statistical technique to determine the significant difference, if any, existing between pretest and posttest data on selected dependent variables. The level of significance was accepted at 0.05 level.

RESULTS

Analysis of covariance was used to determine the impact of interval sprint training on selected speed related parameters and it is presented in table-I.

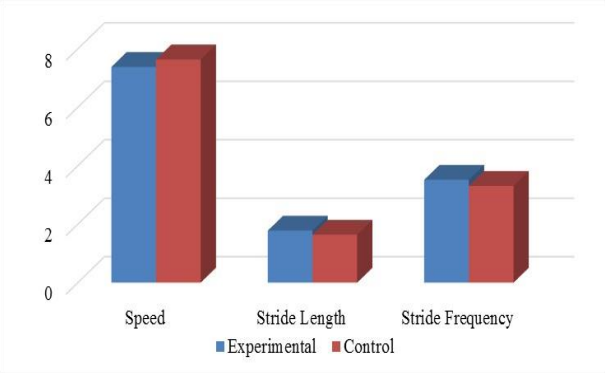
Table I: Analysis of Covariance on Selected Speed Parameters of Interval Sprint Training and Control Groups

Variables	Groups	Adjusted Mean	SoV	Sum of Squares	df	Mean Square	'F' ratio
Speed	Experimental	7.38	B	1.94	1	1.94	27.71*
	Control	7.64	W	2.06	27	0.07	
Stride Length	Experimental	1.78	B	0.83	1	0.73	5.93*
	Control	1.64	W	3.75	27	0.14	
Stride Frequency	Experimental	3.52	B	0.37	1	0.37	37.0*
	Control	3.31	W	0.23	27	0.01	

Required table value for significance at 0.05 level of confidence for df of 1 and 27 is 4.21

The findings of the study shows that significant difference existing between interval sprint training group and control group on speed, stride length and stride frequency, since the obtained 'F' ratio of 27.71, 5.93 and 37.00 respectively are greater than the required table value of 4.21 for significance at 0.05 level of confidence for df of 1 and 27. Hence it is concluded that eight weeks of interval sprint training can produce significant changes on speed, stride length and stride frequency of male sprinters. The adjusted post test mean values on speed, stride length and stride frequency of interval sprint training group and control group are graphically represented in figure-I

Figure-I: Adjusted Post Test Mean Values on Speed, Stride Length and Stride Frequency of Interval Sprint Training and Control Groups



DISCUSSIONS

It has been well documented by Cavanagh and Kram (1990) that humans increase both stride length and stride frequency as running velocity increases. These results support the previous observation by Eicher (1975) that, an increase in speed might cause an increase in stride frequency or stride length or either of the parameters. The study undertaken by Medbo and Burgers (1990) reveals that six weeks of training increased the anaerobic capacity by 10%.

Previous studies have reported the beneficial effects of interval training on speed. The results of the present study are also in line with the observation by Dupont et al., (2004) who trained 22 subjects using high intensity interval training for 10 weeks. Participants performed sprint repetitions consisted of 12-15 all out 40 meters runs alternated with 30 seconds of rest. They suggested that high intensity interval training can be used as a means to improve sprint performance. Additionally, Cheetham and Williams (1987) have been found 11.1% improvement in peak running speed following high intensity training. Also consistent with previous studies, Edge et al., (2005) observed that, five weeks of high intensity interval training resulted in greater improvement in repeated sprint ability than moderate intensity continuous training.

CONCLUSIONS

The result of this study demonstrated that, eight weeks of interval sprint training has significant impact on speed, stride length and stride frequency of male sprinters. Hence it is suggested that the adaptational changes of interval sprint training are very dynamic and variable to each individual.

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