



EFFECTIVENESS OF TABATA TRAINING ON ANAEROBIC CAPACITY AND REACTION TIME IN AMATEUR SPRINTERS- AN EXPERIMENTAL STUDY

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ABSTRACT Sprinting is the ability to run at maximum speed for a short period of time. It is evident that to perform optimally in short duration activities, anaerobic capacity is used. The anaerobic system is capable of responding immediately to the energy demands of exercise and is able to support extremely high muscle power outputs. Sprint training using very brief exercise at high intensity increases the body's anaerobic capacity. Even though reaction time values are very small, they could differentiate final performance in the short sprint races, such as the 60m and the 100m, where the margin of victory is often measured in thousandths of a second. Tabata training is a training method introduced by Prof. Izumi Tabata in 1996, that can improve physical ability, aerobic, and anaerobic. Collectively this study shows the effectiveness of whole body tabata training on anaerobic capacity and reaction time in amateur sprinters that can assist trainers in improving the sprinters performances.

KEYWORDS : Sprinters, anaerobic capacity, reaction time, Tabata training

Introduction:

Sport has long been celebrated as an activity that builds character. A specific and well-planned practice, training, competition, and recovery regime will ensure optimum development throughout an athlete's career (1) Achievements of an athlete is always related to how he/she practices. What is practiced and what is the purpose. Selection methods and the right kind of exercise will support the success of the exercise itself. Sprinting is the ability to run at maximum speed for a short period of time. Sprint training using very brief exercise at high intensity increases the body's anaerobic capacity. Sprinters ideal training method is divided in 3 phases: conditioning, pre-season and competitive (2) Reaction time in athletics has been defined as the time that elapses between the firing of the starter's gun and the moment that the athlete exerts a pre-determined amount of force on the starting blocks. Even though reaction time values are very small, they could differentiate final performance in the short sprint races, such as the 60m and the 100m, where the margin of victory is often measured in thousandths of a second. Anaerobic capacity in sprinting: it is evident that to perform optimally in short duration activities, anaerobic capacity is used. The anaerobic system is capable of responding immediately to the energy demands of exercise and is able to support extremely high muscle power outputs. Sprint training using very brief exercise at high intensity increases the body's anaerobic capacity. Tabata training method is a method of HIIT workout or interval training with high intensity. Meanwhile, the execution was Tabata training method takes four minutes with eight intervals. Each interval takes 20 seconds with high intensity. Physical exercise at a high intensity for 20 seconds and then rest 10 seconds. Repeat this pattern until eight times with a total time of four minutes. (4) SIT vs TABATA TRAINING Sprint interval training (SIT) is efforts performed at intensities equal to or greater than the pace including 'all-out' or 'supramaximal' efforts with an eventual decline in speed and/or a discontinuation of the exercise. In contrast, in the original and authentic Tabata training protocol, the exercise intensity is constant from the first to the last session of the exercise.

NEED OF STUDY: The main goal of every athlete is to reach the highest peak of achievement or become the first champion in every race. Sprinters normally follow a routine including 2 days of running, 1 day of weightlifting, 1 day of jumping exercise 1 day endurance exercise 1 day endurance training, 1 day of reaction drills. To our knowledge there are limited studies on effects of Tabata training in amateur sprinters. Tabata training works on improving aerobic and anaerobic capacity but primarily focuses on improving anaerobic capacity. Hence the need of my study is to study the effects of Tabata training on anaerobic capacity and reaction time in amateur sprinters.

CRITERIA Inclusion criteria Amateur sprinters Age group – 12 to 19 Athletes who have given consent to participate Both male and female amateur sprinters Athletes with minimum 6 months of conditioning training Sprinters with normal ROM Sprinters with strength – grade ≥

3 Exclusion criteria

- Elite sprinters Sprinters undergoing any other training program Sprinters with musculoskeletal injuries in 6 months Deformities Sprinters with any neurological or cardiovascular conditions

OUTCOME MEASURES

Fig 1 - Running-based Anaerobic Sprint Test (ICC = 0.88)



Competitors performed a standard 10-15 minute warm up, after which a 5-minute pause followed before the test. The test consisted of 6 runs with maximum speed on the distance of 35 meters, with a minimum 10 seconds pause among them. Calculation of anaerobic capacity. Anaerobic capacity: sum of all peak power output (PPO = Body mass * Distance ÷ Time)

Fig 2 - Electronic timing system: block



A form of race timing in which the clock is automatically activated by the starting device.

RESULTS

This study was carried out in 20 amateur sprinters by using RAST and Electronic timing system. In the present study it was found that the effectiveness of Tabata training on anaerobic capacity and reaction time was extremely significant as the p value was <0.0001. The pretreatment anaerobic capacity mean was 446.3 with SD 55.401 while the post treatment mean was 482.4 with SD 66.994 T value was 11.620. The pretreatment reaction time mean was 259.455 with SD 31.582 while the post treatment mean was 239.526 with SD 26.316 T value 3.776.

Table 1 – results of anaerobic capacity pre and post Tabata training

PARAMETER	PRE-TEST		POST TEST		T VALUE	P VALUE	RESULT
Running Based Anaerobic Sprint Test	MEAN	SD	MEAN	SD	11.620	<0.0001	EXTREMELY SIGNIFICANT
	446.3	55.401	482.4	63.994			

Table 2 – results of reaction time pre and post Tabata training

PARAMETER	PRE-TEST		POST TEST		T VALUE	P VALUE	RESULT
Reaction Time	MEAN	SD	MEAN	SD	3.776	<0.0013	VERY SIGNIFICANT
	259.455	31.582	239.526	26.316			

CONCLUSION:

This study concludes that the Effectiveness of Tabata training on anaerobic capacity in amateur sprinters is effective and significant. This study also concludes that Effectiveness of Tabata training on reaction time in amateur sprinters is effective and significant.

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