

<https://doi.org/10.48047/AFJBS.6.2.2024.3275-3279>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

The effect of circuit training on improving the digital level of junior middle-distance (800m) runners

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Article History

Volume 6, Issue 2, Apr-Aug 2024

Received: 7 January 2024

Accepted: 19 February 2024

Published: 22 February 2024

doi: [10.48047/AFJBS.6.2.2024.3275-3279](https://doi.org/10.48047/AFJBS.6.2.2024.3275-3279)

Abstract: Background: The aims to study the effect of the circuit training program on improving the digital level of junior middle distances (800 m) in athletics. The sample was chosen intentionally from the middle-distance track and field athletes from the juniors of Al-Arish Sports Club, numbering (10) juniors. Results shows that differences between the pre- and post-measurement of the experimental group in the time to complete the (800) meter race. The significance of the differences between the pre- and post-measurement of the experimental group in the stride length of the (800) meter players.

Keywords: *circuit training, (800m) running, athletics*

Introduction

Athletics is an ancient activity characterized by physical activity that arises with the natural life of man. Athletics is called racing and track games and is one of the oldest sports activities practiced by man not only since the dawn of history, but also when he grows up.

These competitions in the Olympic Games, whether ancient or modern, gradually appeared in their current form for men and women, where they were known as athletics (running, jumping, throwing). They were sometimes called the mother of games, and sometimes the bride of sports tournaments, due to their importance in building the individual physically, healthily and psychologically, in addition to enjoying their various competitions, like other sports games and events, as they all work to develop physical abilities such as strength, speed, endurance, agility and flexibility, which have a positive impact on the development of various sports skills among players, and they also have a positive impact on the growth of a balanced personality, especially in the different stages of human development.

Bastawisi Ahmed (2009) believes that sports training is a purposeful educational process with scientific planning to prepare players at different levels physically, skillfully and psychologically to reach the highest possible level.

Circular training is a training system in which the player moves from one exercise to another in a circuit system according to his need for fitness or skill development according to the coach's estimates. This method aims to develop and improve muscle strength.

Abdo Ali and Qasim Hassan (2020) indicate that during the modern era, the world has witnessed development in various industrial, economic, social, scientific, technical and other principles, which were reflected in sports events and games. Many thinkers and scientists have also emerged in various countries of the world who contributed to the advancement of various sciences of sports education, so modern scientific methods and theories derived from various natural and social sciences have emerged.

Omar Nasrallah (2020) explains that this era is characterized by a successive scientific explosion that develops all areas of life using various branches of science and knowledge and the latest technological methods. This development has extended to the sports field in general and to the field of training in particular. Omar Nasrallah (2021) adds that success or excellence in any sports field is usually the result of sound planning, hard work and commitment to achieving goals. Training is no exception to this rule, as successful athletes train individually and collectively in their specific activity for long hours, for pre-prepared programs designed for long-term training for several years. The importance of training in the sports field depends on improving the infrastructure and the necessary requirements to achieve ideal performance. For the athlete, this means his commitment to implementing programs for many years, with the body and mind responding and adapting to the characteristics of the competitions, which ultimately lead him to high and distinguished performance. Although many coaches and teachers are qualified to design programs for the sports season. Fatima Abdul Maleh and others (2020) believe that circuit training is about organizing the effort exerted in order to achieve adaptation by the player, and this effort includes various activities and exercises, and a momentary stop is made at each training station, in order to perform a specific number of repetitions and exercises or free activities, or activities with tools according to the specified system. Kamal Darwish (2007) states that when using the circuit training method, the order of the exercises, the number of repetitions and their intensity must be considered. When forming circuit exercises, all the main muscles and parts of the body must be involved, but in a successive or consecutive manner, represented by the muscles of the upper and lower limbs, and the abdominal and back muscles. Circuit training increases the efficiency of the circulatory and respiratory systems, which leads to resistance to fatigue and the player's adaptation to the effort exerted. The aims to study the effect of the circuit training program on improving the digital level of junior middle distances (800 m) in athletics.

Sample:

The research community consists of middle-distance track and field athletes from the juniors of North Sinai Governorate, numbering (20) juniors. The sample was chosen intentionally from the middle-distance track and field athletes from the juniors of Al-Arish Sports Club, numbering (10) juniors.

Statistical treatments:

The researcher used the statistical analysis program (SPSS v.20) to process the raw data and extract the statistical treatments. The researcher used the following statistical treatments:

- Percentage. (%)
- Arithmetic mean.
- Standard deviation.
- Median.
- Skewness coefficient.

Results:

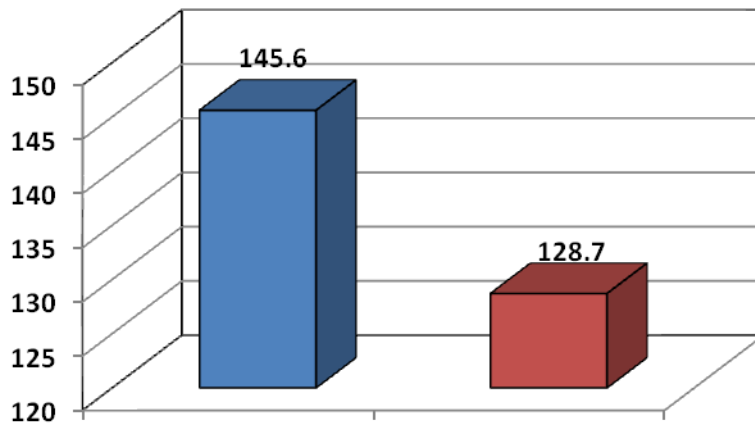


Figure (1). shows the differences between the pre- and post-measurement of the experimental group in the time to complete the (800) meter race.

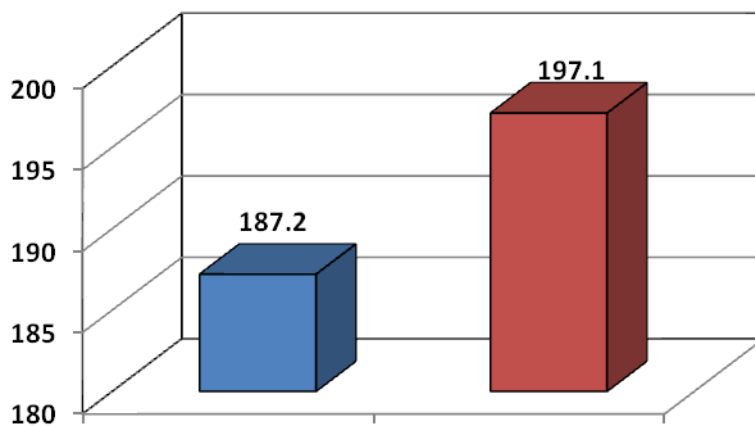


Figure (2). The significance of the differences between the pre- and post-measurement of the experimental group in the stride length of the (800) meter players

Discussion :

The above is consistent with what Ibrahim Salem and Ahmed Salem (2015) stated that when lactic acid accumulation increases in the muscle and acidity occurs, the competitor feels pain. At that point, the competitor trained to withstand speed with intensity between (80-90%) of his maximum capacity can bear this pain and continue performing while enduring the increase in lactic acid accumulation and maintaining a high level of motor performance speed. This is done by improving the capacity of vital organizations and increasing pain tolerance.

Abu Al-Ala Ahmed and Ahmed Nasr El-Din (2003) confirmed that by increasing anaerobic training, the player's ability to endure pain resulting from lactic acid accumulation in the muscles and to continue performing despite this feeling improves.

In this regard, Peter Thompson (2009) added that at the beginning of the run, the phosphagen system is the dominant system for a distance of (100) meters, then it begins to reduce the speed to be less than the maximum for a distance of about (700) meters, and the dominant energy system is the lactic system, and the oxygen

system participates with it in a lesser proportion with an increase in speed in the last (100) meters of the race, as completing the race at high speed leads to a lack of oxygen, which leads to working in the absence of oxygen and thus leads to a high accumulation of lactic acid in the muscles and blood and accelerates the appearance of signs of fatigue. Therefore, training for this activity is to accustom the muscles to working at maximum and less than maximum intensity by reducing the accumulation of lactic acid in the muscles and developing the oxygen and non-oxygen energy systems.

Bastawisi Ahmed (2009) indicates that during high-intensity interval training, the effort increases, which in turn increases oxygen debt, forcing the muscles to work anaerobically and with a small amount of oxygen. This places the responsibility of neutralizing and balancing acidic metabolic wastes such as lactic acid on the blood, and therefore oxygen debt improves through high-intensity interval training.

Ibrahim Salem, Abdel Rahman Abdel Hamid, and Ahmed Salem (2015) add that anaerobic muscle work that results in the breakdown of glycogen in the absence of oxygen leads to the accumulation of lactic acid in the muscles, and resistance occurs between the increased production of the acid and the rate of its disposal in the blood. At this point, the athlete trained using high-intensity interval training becomes more capable of enduring race performance. Thus, the researcher sees that the proportion of the overlap of the aerobic and anaerobic energy systems in the (800) meter running race, with the latter being superior by a higher percentage, the training that the player must practice is speed endurance training in which the intensity of the training stimulus ranges from (80-90%) of the player's maximum capacity, as it works to raise the level of lactate in the muscles and blood to a level higher than 4 mmol, which makes the player feel muscle fatigue and slow muscle response to nerve signals, and accordingly, these trainings must be continued for a period of no less than six weeks until the player adapts to tolerate the increased accumulation of lactic acid in the muscles and maintain a high level of motor performance speed during the competition, which is reflected in improving the time to cover the (800) meter running race distance. It is also clear from the above that muscle strength endurance training helps develop muscle capacity and elasticity, improves stride length, and increases lactic acid resistance, and that developing the element of strength endurance by running on hills works to increase stride length, with the same number of steps, and enhances the efficiency of the muscles in resisting muscle fatigue. Ibrahim Salem and Ahmed Salem (2015) mention that the strength of the leg muscles is an important factor in increasing the stride length, as this strength helps to increase the ground push and flight force.

Abu Al-Ala Ahmed and Ahmed Nasr El-Din (2003) indicate that the (800) meter racer needs dynamic anaerobic endurance training such as strength endurance training, and this type of training requires the efficiency of the muscle's ability to tolerate oxygen deficiency and increase its ability to use anaerobic energy systems while tolerating increased lactic acid.

Osama Riad (2003) explains that high-intensity interval training helps to increase the efficiency of the muscular system and the growth of the player's muscle fiber size, thus increasing his muscle strength, and that the runner's strength endurance is reflected in the stride length and improvement in the level of performance. The length of the stride depends mainly on the force produced in the working muscle groups, and the amount of force the runner exerts to change the momentum of the body in the straight direction at every moment of support and push during the running steps to continue at the required speed reduces the loss of speed and achieves a better time.

The researcher believes that running speed depends on two main factors, which are the length of the stride and its frequency, and that one of the important factors that affect the stride length is the strength of the leg muscles, so it is necessary to develop the strength element to increase the stride length of the (800) meter runners, especially the special endurance (strength endurance) due to the specificity of the race as a point of overlap between the aerobic and anaerobic energy systems. By repeating strength endurance training, lactic acid increases in the muscles, which leads to the appearance of muscle fatigue as a result of muscle stiffness and their inability to reach the full range of motion of the muscles and the low level of propulsion force, which works to reduce the stride length, but by continuing the process of high-intensity interval training for various strength endurance training for a period of no less than six weeks, it works to increase the stride length and causes the

muscles to adapt to work efficiently in light of the accumulation of lactic acid and confront the resistances that occur during the competition period, which is reflected in improving the time to complete the (800) meter running race.

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