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Dr. Rajinder Singh Sekhon

Principal, MGKM Shahi Sports
College of physical Education,
Samrala, Ludhiana, Punjab,
India

Rajesh Godara

Research Scholar, Tantia
University, Sri Ganganagar,
Rajasthan, India

A physiological analysis of 5000 M runners

Dr. Rajender Singh Sekhon and Rajesh Godara

Abstract

It is widely accepted that endurance performance is influenced by aerobic power (VO₂max), lactate threshold, and running economy. Economy of movement is obviously maintained by mechanisms that remain elusive, but they undoubtedly include choices of stride length: cadence, and sources of mechanical power output. Thus there is a relationship between energy expenditure and runner's running style in long distance race. Running style is important to minimize energy expenditure. Sport scientists and coaches, along with most of the athletic federations in the world have recognized the importance for scientific support in the improvement of athlete's performance. A greater understanding of biomechanics of sport movement is important for better training techniques, advances in psychological support, and improvements in coaching education.

The researcher undertaken the following study namely "A Physiological Analysis of 5000 M Runners" which was conducted on 5000m Runners of Punjab Region of India from age group 18 to 25 years as colleges and found that the data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Blood Sugar level increased and found that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Uric acid level is increased, also there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Calcium level increased. It is also found that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Cholesterol level decreased.

Keywords: Physiological analysis, 5000 M runners, energy expenditure

Introduction

According to National Plan of Physical Education and Recreation. "The aim of Physical Education is a must, to make every child physically, mentally and emotionally fit and also to develop in him or her personal and social qualities as will help them to live happily with others and build them up as a good citizen."

Generally, Physical Fitness can be classified into two categories: Health-related fitness and Motor skill related fitness. Physical Educators have long believed that exercise is important to maintain good health. To day degenerative diseases like Cancer, Heart disease, Strokes have replaced communicable disease like tuberculosis, Pneumonia as leading death. Medical Research shows that poor aerobic fitness, obesity and lack of development of certain types of muscular strength, flexibility are related to certain disease.

Health related Physical fitness is defined by the following components such as Muscular Strength & Endurance, Cardiovascular Endurance, and Muscular Flexibility and Body composition. The motor skill-related aspect of physical fitness is a greater significance in athletics. General Motor ability has been considered as one's level of ability in a wide range of activities. It has been thought of as an integrated composite of such individual trait such as Agility, Balance, Coordination, Power, Reaction time and Speed. This level of fitness covers an most of the Physical and Physiological parameters.

The science of physical education shows scientific improvement and demands for more technical support. Based on this the rules and regulations of different games also are modified time to time. Each sport requires its own skills, at least any one of the natural movements like running, jumping (or) throwing, which depends upon the nature of the game. The modern sports activities require adequate level of physical, physiological and psychological qualities. Only through the development of all these qualities, we can enhance the performance to an optimum level.

Correspondence

Dr. Rajinder Singh Sekhon

Principal, MGKM Shahi Sports
College of physical Education,
Samrala, Ludhiana, Punjab,
India

Ever since sport began, athletes have been trying to get the most out of their training. However, it was not until the last few decades, that levels of sport performance have exhibited a spectacular increase. Records that once were imaginary can now be regularly reached. At the same time, the amount of training of modern competitors is considerably higher than that is used in the past. This would not be possible without the concurrent evolution in training methodology. The necessity of superior performances in competition has impelled coaches to introduce increasingly effective and sophisticated training methods.

By nature, human beings are competitive and ambitious for the excellence in all athletic performance. Not only every man but also every nation wants to show their supremacy by challenging the other nations. Thus, this challenge stimulates, inspires and motivates all the nations to sweat and strive to run faster, jump higher, throw farther and exhibit greater strength, endurance and skills. This can only be possible through scientific, systematic and planned sports training as well as channelizing them into appropriate games and sports by finding out their potentialities. At the time of competition, the players realize the importance of these qualities, especially the physiological qualities and the psychological values when under pressurized situations.

Man has to predict physical activities in order to achieve growth and development and also to maintain good health. Muscular strength and flexibility are needed for a good physique as well as excellence to attain performance in any competitive activity. Generally, sports performance depends largely on physical variables. The development of physical efficiency for different types of sports and games is of great significance and requires a great deal of careful selection, specificity and training. Through the use of these modes, the athletes of the developed countries have attained a very high level of skill and performance proficiency.

Running is a cyclic behavior in which the legs swing fore and aft and provide support for the body in alteration as in. It is not only an athletic event but is also important part of other sports. At least four and a half million years ago, human running evolved when our early ancestor ape-like Australopithecus was used jog-trot action for hunting animals. Since that time, no major anatomical changes have occurred in the running apparatus.

In contrast, no such relationship exists for running speed and energy cost. Oxygen cost changes little over a wide range of chosen running speeds. From a cardiovascular model of exercise, it is widely accepted that endurance performance is influenced by aerobic power (VO_{2max}), lactate threshold, and running economy. Economy of movement is obviously maintained by mechanisms that remain elusive, but they undoubtedly include choices of stride length: cadence, and sources of mechanical power output. Thus there is a relationship between energy expenditure and runner's running style in long distance race. Running style is important to minimize energy expenditure. Sport scientists and coaches, along with most of the athletic federations in the world have recognized the importance for scientific support in the improvement of athlete's performance. A greater understanding of biomechanics of sport movement is important for better training techniques, advances in psychological support, and improvements in coaching education.

To justify a movement as an economic one, it is very essential to analyse the movement first. Some time, it is very difficult for a human eye to analyse all the movements of various body segments and joints at the same time, so various instruments

like still camera, video camera etc. are used to analyse various movements.

Significance of the study

The findings of this study may contribute significantly rather as a quantum leap in raising the standards as 5000m runners.

1. The study will be helpful to find out the similarities and dissimilarities between the aerobic power 5000m Runners.
2. Physical education teacher and coaches may be better equipped in improving 5000m Runners during training & competition.
3. The study may affect the players for better race performance.

Statement of the Problem

The statement of the problem is "A Physiological Analysis of 5000 M Runners"

Objective of Study

The main objectives of this study would be as stated underneath

1. To determine the effect of various type of physiological Aspects
2. To determine the effect of Blood Sugar during 5000 m run.
3. To determine the effect on Uric Acid
4. To determine the effect on WBC.
5. To determine the effect on HGB.
6. To determine the effect on Cholesterol Profile.
7. To determine the effect on Uric Acid.
8. To determine the effect on R.B.C.
9. To determine the effect on Platelets

Hypothesis of the Present Study

1. It is hypothesized that there will be significant effect on Blood Profile.
2. It is hypothesized that there will be significant effect on Water Presence in Body.
3. It is hypothesized that there will be significant effect on Oxygen Presence.
4. It is hypothesized that there will be significant effect on Cholesterol Profile.
5. It is hypothesized that there will be significant effect on Urine Profile.
6. It is hypothesized that there will be significant effect on PLT.
7. It is hypothesized that there will be significant effect on Calcium.
8. It is hypothesized that there will be significant effect on W.B.C.

Delimitations

1. The study will be delimited to 5000m Runners.
2. The study will be delimited in Punjab Region of India.
3. The Runners will be taken from age group 18 to 25 years as colleges.

Limitations

1. The factor's line heredity family history, daily Routine life style habits, that can have influence on the results of me study cannot be controlled.
2. Data will be collected. Over a significant period of me influence of the variation in weather etc. cannot be taken in to account.

Review of literature

The success of work is built on the foundation of the required knowledge of a particular field. The pre-existing knowledge helps the learner to know what is already known and what is yet to be known. In the field of research, this knowledge can be acquired from the various research reports, journals, abstracts, dissertations, thesis, books, magazines etc.

Conducted a study on long jump. Most young athletes will have difficulty in performing the Hitch- kick, because it requires considerable speed and sufficient time in the air to perform well. However, an elementary long jump and a rudimentary form of the hang technique are well within reach of young athletes. Remember that the most important requirements in this event are speed and springing abilities. An athlete does not have to perform a hitch-hick or a hang to jump good distance.

Investigated a study on the long jump. This is an event which requires speed and powerful jumping ability. Speed is self evident but power needs to be defined as a very fast application of force, in other words a combination of speed and strength. The long jumper is required to generate maximum controllable speed on the run way to achieve the best results. The maximum controllable speed is determined by the athlete's sprint speed and how quickly maximum force can be applied into the ground at the take-off board. Therefore, the training emphasis will focus upon the development of (1) Sprint speed, (2) muscular strength, and (3) power.

conducted a Kinematics study on the technical parameters demonstrated by Chinese and foreign elite female long jumpers which showed that the main methods of improving long jump results were as follows: increasing the absolute speed during the run-up and the angle of take-off, as well as achieving an optimal relationship between the initial velocity and the angle of take-off.

Investigated the Olympic athletes who participated in Mexico. The study showed that the sum of three skin folds values of all track group was low, but the sprinters were with greater skinfolds than other track athletes. Some of the leanest athletes among them were track athletes, but most were in the long distance runners. The lowest skinfold recording was 11.2 mm for a distance runners but one sprinter was the lowest with 11.7 mm. The sprinters were significantly higher in endomorphy and mesomorphy than all other groups except walkers and were significantly lower in ectomorphy than all other groups.

Carried out a study to know the relationship between the somatotype, body posture and physical performance in sports. The study showed that in high performer athletes, a certain somatotype is a morphological pre-supposition for their high sports performance. It was noticed that the weight lifters had a high value of mesomorphy. They also had short limbs which help them in lifting the weight.

Conclusion

1. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Blood Sugar level increased.
2. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Uric acid level is increased.
3. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just

after race and after 2 hours of race/recovery. Calcium level increased.

4. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. Cholesterol level decreased.
5. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. WBC level decreased.
6. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. HGB level decreased.
7. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. RBC level decreased.
8. The data of 5000m race athletes shows that there is a significant difference between resting, before/race just after race and after 2 hours of race/recovery. PLT level decreased.

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