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## Effects of selected anthropometric and motor fitness variables on skill performance of sprinters

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### Abstract

The purpose of the research was to investigate the Effects of selected Anthropometric and Motor fitness variables on Sprinters. Anthropometric variables are Standing Height and Leg length, Motor fitness variables are Speed and agility. This study was conducted on 20 boy athletes of Haveri District, Karnataka State. The age group of athletes range from 12 to 16 years. Tests conducted were 50m dash for speed, 4 X 10mtrs shuttle run agility. Training programme was conducted for sprinters.

**Keywords:** Height, leg length, speed, agility and running

### Introduction

Running in individuals is associated with improved health and life expectancy. It is assumed that the families of humanity developed the ability to run fast to hunt animals. Competitive running grew out of religious festivals in various areas such as Asia, Greece, Egypt and African countries the theory as first proposed used comparative biological evidence and the natural habits of animals when running, indication the likelihood of this activity as a successful hunting technique.

The first explanation is "To go quickly by moving the legs more rapidly than a walk and in such a manner that for an instantaneous in each step all or both feet are off the ground"

Any physical activity in life one's attitudes and thinking are supreme to the outcome understood through human personal exertions. Through struggle and the effort of the footrace and the heaving and grasping price to be paid by its end, I personally observed the victory of the human spirit in myself and in others. Only runners can know, our chosen sport regularly provided me and those others with a strong sense of personal gratification and success.

Sprinting is running over a short distance at the highest speed of the body in a partial period of time. It is used in many sport events that integrate running, typically as a way of rapidly reaching a goal. Sprint event is one of the simplest events in the history of mankind. No expensive equipment, no team is needed. It's one person against at least one other participant. So that why running especially sprint event has been part of the Olympics since their beginning.

Anthropometry is the science of measure the size and proportions of the human body. Anthropometry means the measurements of man, whether living or dead body and consists mainly in the measurements of the dimensions of the body. Anthropometric measurement has discovered correlation between body structure physical appearances and sport capabilities. Anthropometry provides a valuable assessment of nutritional status in children and adults. The core elements of anthropometry are height, weight, body circumferences, body mass index, leg length and skin fold thickness etc., Anthropometric measurements can also evaluate body configuration in athletes this has been shown to enhance the competitive performance of athletes and to help identify fundamental therapeutic problems, such as eating disorders.

The maximum athlete's potential, several things need to be done. This is to determine the appropriate nutrition for athletes, how the type of exercise is suitable for athletes, and intensity of training for athletes. Some of the above can be known by taking anthropometric measurements. Appropriate nutrition affects the athlete's performance when competing. Anthropometric measurements discuss or be able to analyse the development of body shape and its relationship with health, immunity of a disease, attitude, physical abilities and

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personality quality.

Those athletes with longer leg length to their heights seem to be able to run faster than other athletes. The length of an athlete's leg compared to his height has an influence on his performance. Thus, longer leg may result in better performance of their standing height ran the 100-meter sprint faster, had a greater running velocity during the 30-meter flying sprint and had a greater stride length. Clearly, leg length isn't trainable, but it does serve as a good example of how genetics impacts speed.

Speed is one of the most exclusive traits in an athlete. Speed is the ability to cover distance in a particular amount of time. Speed in sports is described as the ability to perform any sort of movement. It is a learned skill that many athletes spend little time perfecting. Speed work is the most demanding of all training forms on your nervous system, and we are always looking for quality not quantity. Therefore, it must be tactically phased into an athlete's program. Some sports scientists even consider speed as an important part of balance skills since quicker force production can help you recover your balance quicker.

Speed is crucial in all sports that require skill, speed, agility, acceleration and quick movements in all type of sports. These includes a wide variety of field sports, water sports and court-based sports. Speed is the one factor that can set you apart from your race. Speed requires both skill and power. It can also make every movement both faster and more effective.

Agility is one the main motor fitness components for sprinters. It helps the body, to maintain proper alignment, posture during movement and performance in activities that require you to change direction quickly while keeping balance, speed, strength and body control. Agility training can be beneficial for many athletes or any individual who wants to improve their sports performance.

**Instruments:** The instruments used for collection of data were stadiometer, steel tape, stopwatch, cones and measuring tape.

**Variables:** Height measurements were taken by stadiometer, leg length measured by steel tape, speed measured by stopwatch and agility measured by 4X10mtrs run.

#### Aim of the Study

The purpose of the study was to find out the relationship of selected anthropometric and motor fitness variables on sprinters.

#### Significance of the Study

1. This research helps us to understand the Relationship of Anthropometry measurements such as height and leg length is influence on Skill Performance of sprinters.
2. It also helps understand the motor fitness variables like speed, agility on Skill Performance of sprinters
3. The finding of the study may also help physical trainers, coaches and physical education teachers as motor abilities and Anthropometric variables underlining the performance can be recognized in athletes.
4. This research can help athletes and their trainer choose the events based on their body composition.

#### Hypothesis

There would be significant relationship between selected anthropometric and motor fitness variables on skill performance of sprinters.

#### Methodology

Based on random sampling 20 sprinters were selected from Haveri District. The age of the subjects ranged between 12-16 years boys.

- Pre-test and post training test were conducted.
- Anthropometric variables like height and leg length were measured and motor fitness variables of 50-meters dash for speed, 4X10mtrs run for agility. The data is then analysed using statistical parameters mean and standard deviation.

#### Criterion measures

The criterion measures of selected anthropometric measurements and motor fitness variables adopted in this study are as below.

#### Anthropometric

- a. Height:** To measure height stadiometer was used, and measurement was taken in centimetres
- b. Leg length:** To measure leg length measuring tape was used and measurement was taken in centimetres.

#### Motor fitness

- a. Speed:** To measure speed, 50-meter dash test was taken and recorded in seconds.
- b. Agility:** To measure agility test 4X10mtrs run test was taken and recorded in seconds.

#### Data and Analysis

**Table 1:** Mean and Standard Deviation values of Pre and Post training of Anthropometric variables

Sl. No	Variables	Test	Mean score	Standard deviation value
1.	Height	Pre test	147.9 c.ms	6.64
		Post test	148.3 c.ms	6.72
2.	Leg length	Pre test	86.2 c.ms	3.38
		Post test	87.5 c.ms	3.25

**Table 2:** Mean and Standard Deviation values of Pre and Post training of Motor fitness variables

Sl. No	Variables	Tests	Mean Score	Standard deviation Value
1	Speed	Pre test	8.62secs	0.69
		Post test	8.36 secs	0.72
2	Agility	Pre test	11.97 secs	0.56
		Post test	11.72secs	0.61

#### 4. Interpretation

For all 20 sprinters anthropometric measurements were taken and mean and standard deviation was calculated (displayed above) according to which Height and leg length has increased its mean height from 147.9 c.ms to 148.3 c.ms and leg length was 86.2 to 87.5. However, there is difference between pre-test and post-test in height and leg length.

Motor fitness variables Speed, agility tests were conducted pre and post training. In Speed 50 meters dash test subjects improved their average timings from 8.62 seconds to 8.36 seconds. For agility 4X10 mtrs shuttle run test was conducted where sprinters improved their timings 11.97 seconds to 11.72 seconds. The results of the study showed that there was a significant difference between pre-test and post training test of sprinters.

The above table indicates that skill performance of sprinters significantly improved in relation to Anthropometric and Motor fitness variables.

Based on the data collected and analysed it can be said that post training Anthropometric variable like Height, leg length and Motor fitness variable like Speed, and agility has shown a significant improvement when compared to pre training schedule, which in turn has improved the skill performance of sprinters.

### **Conclusion**

Following conclusions were drawn from the present study. Sports is conserver of fitness. It contributes greatly to the overall development and wellbeing of a person. So, it has great importance on each stage of our life. However, every sports activity desires a specific type of body structure that along with training that is daily routine of motor exercises contributes immensely on the athlete's performance.

Based on the statistical findings in the study It can be concluded that Anthropometric variables like Height and Leg length and Motor fitness variables Speed, and agility has significant impact on the skill performance of Sprinters.

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