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Evaluation of selected anthropometric characteristics of 100 and 200 meter sprinters

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Abstract

The aim of the present study was to explore the interrelationship of selected anthropometric characteristics to 100 and 200 meter sprinters. Thirty-three female sprinters of 100 and 200 meter who participated in the Intercollegiate Athletic Meet, organized by RTM Nagpur University, Nagpur, 2018, served as subjects for this study. The selected Anthropometric characteristics i.e., body weight, standing height, sitting height, arm length, and leg length. Finding reveals that there was a higher significant relationship between body weight (-0.61), standing height (-0.58), sitting height (-0.64), arm length (0.51), leg length (-0.68) with the sprinters' performances of the athletes as the obtained values are higher than the Table which is 0.344 required for the significant at 0.05 level of significance.

Keywords: Anthropometric characteristics, 100 and 200 meter sprinters.

Introduction

Athletics is derived from the Greek word 'Athlos' meaning fight, competition, or combat. The thousands of claims received annually by the editors of the Guinness Book of Records bear striking testimony to mankind's desire to be the best at something, and sometimes it seems that anything will do Athletics provides, more than almost any other activity, the opportunity for people to measure themselves in competitive situations.

Athletics is a group of sporting events that involves competitive running, jumping, throwing, and walking. The most common types of athletics competitions are track and field, road running, cross country running, and racewalking.

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Organised athletics are traced back to the Ancient Olympic Games from 776 BC, and most modern events are conducted by the member clubs of the International Association of Athletics Federations. The athletics meeting forms the backbone of the modern Summer Olympics, and other leading international meetings include the IAAF World Championships and World Indoor Championships, and athletes with a physical disability compete at the Summer Paralympics and the IPC Athletics World Championships.

The results of racing events are decided by finishing position (or time, where measured), while the jumps and throws are won by the athlete that achieves the highest or furthest measurement from a series of attempts. The simplicity of the competitions, and the lack of a need for expensive equipment, make athletics one of the most common types of sports in the world. Athletics is mostly an individual sport, with the exception of relay races and competitions which combine athletes' performances for a team score, such as cross country.

Organized athletics are traced back to the Ancient Olympic Games from 776 BC. The rules and format of the modern events in athletics were defined in Western Europe and North America in the 19th and early 20th century, and were then spread to other parts of the world. Most modern top-level meetings are held under the auspices of World Athletics, the global governing body for the sport of athletics, or its member continental and national federations.

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Sprinters are born and not made. Basic speed is the hardest aspect to improve speed and sprinting ability is largely determined by inherited traits. The muscle fiber composition of the body and coaching is extremely limited as it cannot give much help to the sprinter. Coaching may improve technique but it cannot give leg speed or fast reaction to athletes who do not have it. Sprinters should give as much credit to their parents as to their trainers and coaches.

Sprints are short-running events in athletics and track and field. Races over short distances are among the oldest running competitions. Sprint is the running of short distances at full speed. It includes short distance races i.e., 50 m, 100 m, 200 m. Some of the runners can even sprint run at full speed distances of 400 m., and even more than quarter-mile race and those beyond this distance in the category of middle distance.

The measurement of structure and proportion of the body is called anthropometry. Anthropometry is the systematic measurement of the physical properties of the human body. Measurements like eye height, the distance from the floor to a person's eyes, can be taken sitting or standing. Other measurements include elbow height, hip breadth, overall stature, knuckle height, and popliteal height, or the distance from the floor to the back of the knee. These measurements play an important role in the design of architecture, furniture, tools, cars, clothes, and more to fit the human body. For example, the height and width of a doorway, or the height and depth of a cabinet or countertop all rely on anthropometry. Anthropometry has wide application as one of the essential parameters constituting the selective diagnostics of any game or sports. Anthropometry consists of making external measurements of the human body. The result can be used to appraise body build, nutritional status, and posture.

Materials and Methods

The subjects were 100 and 200 meter female sprinters of the different colleges that were from RTM Nagpur University, Nagpur, and athletes were participated in Intercollegiate Athletics Meet organized by RTM Nagpur University. Thirty-three 100 and 200 meter female sprinters average aged 22 years selected as a subject. The Anthropometric characteristics i.e., Body Weight, Standing Height, Sitting Height, Arm Length, and Leg Length were selected.

Criterion variables

1. Body weight
2. Standing height
3. Sitting height
4. Arm length
5. Leg length

100 and 200 meter sprint was administered to assess performances of athletes.

Table 1: Administration of the test and collection of data

S. No.	Variable	Equipment or Test used	Test (Units)
	Body weight	Weighing machine	In kg
	Standing height	Anthropometric rod	In cm
Anthropometric characteristics	Standing height	Anthropometric rod	In cm
	Sitting height	Anthropometric rod	In cm
	Arm length	Steel tape	In cm
	Leg length	Steel tape	In cm

100 and 200 meter Sprints performance were measured by the two experts with the help of stop watch.

Statistical technique

In order to find out the relationship of selected anthropometric characteristics of the subjects with sprinter performance, Pearson's Product Moment correlation was calculated. The level of significance was at 0.05.

Table 2: Relationship of sprint to anthropometric characteristics

S. No.	Variables	Coefficient of correlation 'r'
1.	Body weight	- 0.61*
2.	Standing height	- 0.58*
3.	Sitting height	- 0.64*
4.	Arm length	- 0.51*
5.	Leg length	- 0.68*

($r_{0.05} = 0.344$)

Findings

Findings reveal that there was higher significant interrelationship between body weight (-0.62), standing height (-0.58), sitting height (-0.64), arm length (-0.51), leg length (-0.68) with the sprinters' performances of the athletes as the obtained values are higher than the Table 2 which is 0.344 required for the significant at 0.05 level of significance.

Discussion and Conclusion

In the case of the interrelationship between the anthropometric characteristics and the performance of sprinters of the athletes, there was a negative higher interrelationship in all the variables with performance namely; body weight (-0.62), standing height (-0.58), sitting height (-0.64), arm length (-0.51), leg length (-0.68). Results is evident to show that there was a significant interrelationship between the performance of sprinters and anthropometric characteristics. The reason could be attributed to the fact that in sprint events probably reaction time speed of movement and frequency of the stride are much more important than the bodily measurements. A sprinter has to react quickly to the stimulus i.e., gun or clapper and also has to have quick frequency stride to initially start the movement and there after complete the event.

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