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Interrelationship between 100 M sprinters performance and their anthropometric body measurements: A comprehensive study

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Abstract

The objective of the study is to see the correlation between 100m sprinters performance and their anthropometric body measurements. For the above study researcher has selected tools which were standing height, leg length, foot & palm length, quadriceps circumference, calf circumference for anthropometric measurements and for measuring their 100 meter performance, researcher has used 100m run as a tool. 50 students were selected using convenient sample method in which subjects that were selected aged between 18-25 and have been participating in the state level athletic competitions. Researcher has used Pearson's Coefficient of Correlation for interpreting the data and results obtained through interpretation showed that there was no significant correlation found between 100m sprinters and other variables which includes standing height leg length, foot palm length, calf circumference length performance of the athletes but quadriceps circumference and 100m sprinters performance showed significant correlation at 0.01 level of significance.

Keywords: Performance, anthropometric measurements, sprinters

Introduction

Sport pertains to any form of competitive physical activity or game that aims to use, maintain, or improve physical ability and skills while providing enjoyment to participants and, in some cases, entertainment to spectators. Sports can, through casual or organized participation, improve participants' physical health. Hundreds of sports exist, from those between single contestants, through to those with hundreds of simultaneous participants, either in teams or competing as individuals. In certain sports such as racing, many contestants may compete, simultaneously or consecutively, with one winner; in others, the contest (a match) is between two sides, each attempting to exceed the other. Some sports allow a "tie" or "draw", in which there is no single winner; others provide tie-breaking methods to ensure one winner and one loser. A number of contests may be arranged in a tournament producing a champion. Many sports leagues make an annual champion by arranging games in a regular sports season, followed in some cases by playoffs.

Sport is generally recognised as system of activities based in physical athleticism or physical dexterity, with major competitions such as the Olympic Games admitting only sports meeting this definition. Other organisations, such as the Council of Europe, preclude activities without a physical element from classification as sports. However, a number of competitive, but non-physical, activities claim recognition as mind sports. The International Olympic Committee (through ARISF) recognises both chess and bridge as bona fide sports, and Sport Accord, the international sports federation association, recognises five non-physical sports: bridge, chess, draughts (checkers), Go and xiangqi, and limits the number of mind games which can be admitted as sports.

Play is a range of intrinsically motivated activities done for recreational pleasure and enjoyment. Play is commonly associated with children and juvenile-level activities, but may be engaged in at any life stage, and among other higher- functioning animals as well, most notably mammals and birds.

Many prominent researchers in the field of psychology, including Melanie Klein, Jean Piaget, William James, Sigmund Freud, Carl Jung and Lev Vygotsky have erroneously viewed play as

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confined to the human species, believing play was important for human development and using different research methods to prove their theories.

Play is often interpreted as frivolous; yet the player can be intently focused on their objective, particularly when play is structured and goal-oriented, as in a game. Accordingly, play can range from relaxed, free spirited and spontaneous through frivolous to planned or even compulsive. Play is not just a pastime activity; it has the potential to serve as an important tool in numerous aspects of daily life for adolescents, adults, and cognitively advanced non-human species (such as primates). Not only does play promote and aid in physical development (such as hand-eye coordination), but it also aids in cognitive development and social skills, and can even act as a stepping stone into the world of integration, which can be a very stressful process. Play is something that most children partake in, but the way play is executed is different between cultures and the way that children engage with play varies universally.

Playing is natural tendency of every person. From child to adults, everybody loves to play. People chose their games depending upon the culture of their country, time, place, situation, culture, environment. Playing is an art as well as science. If you want to progress in any field then you base should be scientific. It is just like a tree, if the roots of the tree

goes deep inside the base, then the main branch of the tree becomes stable and strong. We must not give chance to a wrong person or a person not possessing those qualities to be able to excel in that particular sport. The future of sport is in the dreams like an idea, training is also similar to dreams because there are so many things which are new for the science and which are yet to be discovered and invented by the scientists. Sport is an event where different situations happen and sometime it is very difficult to understand the reasons behind these performances done by the players.

Research Procedure

Researcher has used correlation research method from descriptive research method. The study has been conducted by choosing five tools to measure their Standing height, Leg length, Foot palm length, Quadriceps circumference, Calf circumference in Centimeter anthropometric measurements and 100 meter run in second tool to measure their performance and Population of this study was 70 subjects amongst the 35 districts of Maharashtra and from population researcher has selected 50 students aged Between 18 to 25 as a sample for study.

Result

Table 1: Descriptive Statistical Analysis of Performance and Body Measurement

Name	N	Mean	Std Dev.	Std Error	Min.	Max.
100 meter sprinters performance	50	11.69	0.596	0.08429	10.30	12.60
Standing height	50	171	6.50	0.91956	152	185
Leg length	50	97	4.98	0.70552	86	110
Foot palm length	50	25	1.58	0.22345	22	28
Quadriceps circum	50	47	4.36	0.61605	40	57
Calf circumference	50	33	2.83	0.39913	28	42

Above table showing that after statistical data interpretation mean of 100 meter sprinters performance is 11.69 and standard deviation is 0.596 and standard error is 0.08429. Minimum performance is 10.30 sec. and maximum performance is 12.60. and Mean of standing height of 100 meter sprinters performance is 171, standard deviation is 6.50 and standard error is 0.91956 minimum in standing height is 152 and maximum is 185. Mean of leg length of 100 meter sprinters performance is 97, standard deviation is 4.98 and standard error is 0.70552 minimum in leg length is 86 and maximum is 110. Mean of foot palm length of 100 meter

sprinters performance is 25, standard deviation is 1.58 and standard error is 0.22345 minimum in foot palm length is 22 and maximum is 28. And Mean of quadriceps circumference of 100 meter sprinters performance is 47, standard deviation is 4.36 and standard error is 0.61605 minimum in quadriceps circumference is 40 and maximum is 57. Mean of calf circumference of 100 meter sprinters performance is 33, standard deviation is 2.83 and standard error is 0.39913 minimum in is 28 and maximum is 42. Table no. 2: Interpretation of 100 meter sprinter performance and body measurements.

Table 2: Interpretation of 100 meter sprinter performance and body measurements

Variables	Numbers	Pierson's Co-efficient of Correlation	Significance Level
Standing height	50	- 0.08	0.580
Leg Length	50	- 0.172	0.233
Foot Palm Length	50	- 0.207	0.150
Quadriceps Circumference	50	- 0.580	0.001**
Calf Circumference	50	- 0.236	0.099

In the above Table after interpretation of data the correlation between 100 meter sprinters performance and standing height is 0.08 and significance level is found 0.580 which states that there is no correlation between the two components and not significant at the 0.05 level of significance. The leg length and performance of 100 meter sprinter is not significant at 0.05 level of significance as correlation found between the two components is 0.172 and significance level is found 0.233. The foot palm length and performance of 100 meter sprinter is

also not significant at 0.05 level of significance as correlation of coefficient between the two components is found to be 0.207 and significance level is found 0.150. There is good correlation found between the quadriceps circumference and performance of 100 meter sprinters as correlation of coefficient is found to be 0.580 and significance level is 0.001 which is significant at 0.05 level The calf circumference and performance of 100 meter sprinter is not significant at 0.05 level as it showed correlation of coefficient 0.2 and

significance level is found to be 0.099.

Conclusion

Standing height, leg length, foot palm length, calf circumference has no significant correlation but quadriceps circumference has significance correlation with 100 meter sprinters performance.

Discussion

Researcher has found no correlation between standing height and 100 meter performance of the athletes also if we have a look at the previous researches done in the same field in the year 2010 by Uye Tak Uei who found that there was very less correlation between the same components also research done in the year 1973 by James found out through biomechanical analysis of 100 meter performance that stride length and stride frequency are two essential components in sprinting event. He found that even though players have good height and good stride length but were not having good stride frequency but in case of those having small height, small stride length were having good stride frequency. Hence he proposed that there is no correlation between standing height and 100 meter sprint.

Researcher only found correlation between 100 meter performance and quadriceps circumference also other researchers H.J. Rechael and E.J. Rechael found out that there is a good correlation between 100 meter performance and quadriceps circumference, type of the muscle fibre and length of the muscle fibre in the quadriceps muscle. Hence researches found proposed that circumference of the quadriceps muscle relates to the 100 meter performance of the athletes. Hence there is direct relationship between the same components.

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