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Selected anthropometric and physical fitness measures as predictors of performance in 110 meters hurdles track event

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Abstract
The present study was conduct to determine the selected anthropometric and physical fitness measures as predictors of performance in 110 meters hurdles track event. Anthropometry is the application of measurements to the study of human size, shape, proportion, composition, maturation and gross functions. Physical fitness as some aspects of desired life has a closer relationship to physical health, but it has a concept more comprehensive than physical aspects so that, without health, one cannot at all gain full physical fitness. The present study was carried out on fifty male athletes, who were participated in All India Interuniversity. Selected anthropometric parameters were measured by standard equipment. Linear measurement, researcher used Anthropometric rod, girth of the subject's flexible steel tape was used, skin fold measurement of the subject's skin fold calliper was used and diameters were measures with the help of Sliding Calliper. Collect the data for physical fitness of male athletes, AAPHER youth fitness test (1976) was used. The selected anthropometric variables were taken for the study (Height, leg length, shoulder circumference, hip circumference, shoulder diameter, elbow diameter, thigh skin fold, biceps skin fold). To find out the relationship, Pearson`s Product Moment Correlation was applied. For testing hypothesis, level of significance was set at .05 levels. Combined Contribution of selected Anthropometric and Physical fitness Variables to the 110 meters hurdles event Performance. It is evident from the combined contribution of the height, Leg length, Shoulder circumference, Hip circumference, Shoulder diameter, Elbow diameter, thigh skin fold & Biceps skin fold and physical fitness variables (50 yards dash, 600 yards run and Shuttle Run 10x4m, Arms pull-ups) are significantly related to the performance in 110 meter hurdles sprint. Therefore athlete who got highest performance in 110 meters hurdles test has significant relationship between the selected anthropometric and physical fitness variables. It is proved that these anthropometric and physical fitness variables help to increase 110 meters hurdles performance.

Keywords: anthropometric, physical fitness measures, hurdles track event

Introduction
Physical activity improve overall health and fitness and to prevent many adverse health outcomes. The benefits of physical activity occur in generally healthy people, in people at risk of developing chronic diseases, and in people with current chronic conditions or disabilities. Physical activity affects many health conditions, and the specific amounts and types of activity that benefit each condition vary. In developing public health guidelines, the challenge is to integrate scientific information across all health benefits and identify a critical range of physical activity that appears to have an effect across the health benefits. One consistent finding from research studies is that once the health benefits from physical activity begin to accrue, additional amounts of activity provide additional benefits.

Although some health benefits seem to begin with as little as 60 minutes (1 hour) a week, research shows that a total amount of 150 minutes (2 hours and 30 minutes) a week of moderate-intensity aerobic activity, such as brisk walking, consistently reduces the risk of many chronic diseases and other adverse health outcomes. Sports competitions provide outlets to the people by giving them a sense of personal identity as well as feeling group's membership and social identification, while assuming personal identity one gets personal satisfaction. This urge of satisfaction continues to help the individual to develop one's all-round personality.

All-round personality not only blends the individual with good qualities but also helps them to achieve pinnacle in their life.

Methodology

The present study was carried out on fifty male athletes, who were participated in All India Inter-university. Selected anthropometric parameters were measured by standard equipment. Linear measurement, researcher used Anthropometric rod, girth of the subject's flexible steel tape was used, skin fold measurement of the subject's skin fold calliper was used and diameters were measures with the help of Sliding Calliper. Collect the data for physical fitness of male athletes, AAPHER youth fitness test (1976) was used. The selected anthropometric variables were taken for the study (Height, leg length, shoulder circumference, hip circumference, shoulder diameter, elbow diameter, thigh skin fold, biceps skin fold). To find out the relationship, Pearson`s Product Moment Correlation was applied. For testing hypothesis, level of significance was set at .05 levels.

Result and statistical findings

The scores of each selected anthropometric and physical fitness components are presented in the following table:

Table 1: Descriptive Statistics and relationship of selected Anthropometric variables to performance in 110m hurdles event (N-50).

Sr. No.	Variables	Mean	S.D.	Coefficient of correlation	P-value
1	Performance	15.1154	1.04139	-.682**	.000
	Height	170.6400	4.35074		
2	Performance	15.1154	1.04139	-.651**	.000
	Leg Length	97.7600	2.93160		
3	Performance	15.1154	1.04139	-.755**	.000
	Shoulder Circumference	99.4600	2.46783		
4	Performance	15.1154	1.04139	.616**	.000
	Hip Circumference	95.9200	5.67788		
5	Performance	15.1154	1.04139	-.298*	.036
	Shoulder Diameter	3.2480	.20726		
6	Performance	15.1154	1.04139	.339*	.016
	Elbow Diameter	2.5480	.46609		
7	Performance	15.1154	1.04139	-.666**	.000
	Thigh skin fold	56.6000	2.87849		
8	Performance	15.1154	1.04139	-.669**	.000
	Biceps skin fold	86.0800	2.23917		

*. Correlation is significant at the 0.01 level (2-tailed). p0.01 (-.623) =.000

Table 1 reveals that the statistical findings of height can be clearly interpreted as that the height increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant coefficient correlation (-.682**), the Statistical findings of leg can be clearly interpreted as that the leg length increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant correlation coefficient (-.651**), the statistical findings of shoulder can be clearly interpreted as that the shoulder circumference increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant correlation coefficient (-.755**), the statistical findings of hip can be clearly interpreted as that the Hip circumference increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the significant correlation coefficient (.616**), the statistical findings of shoulder diameter statistical findings can be clearly interpreted as that the Shoulder diameter increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant correlation coefficient (-.298**), the statistical findings of elbow diameter can be clearly interpreted as that the Elbow diameter increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the significant correlation coefficient (.339*), the statistical findings of thigh skin fold can be clearly interpreted as that the Thigh skin fold increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant correlation coefficient (-.666**), and the statistical findings of Biceps skin can be clearly interpreted as that the Biceps skin fold increases, leads to deducts the timing or improve the performance of 110 meter hurdlers due to the negative significant correlation coefficient (-.669**).

Table 2: Descriptive Statistics of 110 meters hurdles with physical fitness components.

	Mean	S.D.	N
Performance	15.1154	1.04139	50
Endurance	1.4454	.10742	50
Strength	19.2200	6.04841	50
Agility	8.2200	.81816	50
Speed	6.3820	.66813	50

Table 2 reveals that the mean ± Std. Deviation of 110 meters hurdles with physical fitness components. Endurance 1.445 ±. 10742, Strength 19.800 ± 6.04841, Agility 8.2200 ±. 81816 and speed 6.3820±.6681.

Table 3: C0- efficient Correlations of 110 meters hurdles with physical fitness components.

		Performance	Endurance	Pull ups	Shuttle Run	50 M Dash
Pearson's Product Moment Correlation	Performance	1.000	.680**	-.785**	.787**	.803**
	Endurance		1.000	-.548	.549	.718
	Strength			1.000	-.721	-.626
	Agility				1.000	.608
	Speed					1.000

**Correlation is significant at the 0.01 level (2-tailed)

Table 3 reveals that Correlation Matrix for each of the correlation coefficient at the 0.01 level has been shown. The correlation coefficient with asterisk mark (*) indicates that it is significant at 1% level. The table also evident the correlation matrix of the different Physical fitness variables for 110 meters hurdles.

Discussion of results

The findings obtained from the present study are discussed taking into consideration their correlations, and regression equations of the related categories 110 meter hurdles.

Linear measurement

From the analysis of the results it is clear that co-efficient of correlation of standing height, Leg length have significant and positive correlation with performance in 110 meter hurdles significant at .01 level and so, these significantly correlated variables contribute to the performance in 110 meter hurdles. All the variables are directly proportional to the 110 meter hurdles performance. If height or leg length will increases, the stride length will also increase.

Circumference

Among the circumference measurements it is suggested that co- efficient of correlation of Hip circumference, shoulder circumference have significant and positive correlation with performance in 110 meter hurdles significant at the .01 level and so, these significantly correlated variables contribute to the performance in 110 meter hurdles. It is proved that hip circumference and shoulder circumference also help to increase 110 meter hurdles performance.

Diameter

Among the diameter measurements, it is suggested that coefficient of correlation of Shoulder diameter, Elbow diameter have significant and positive correlation with performance in 110 meter hurdles significant at the level of .01 and so, these significantly correlated variables contribute to the performance in 110 meter hurdles. It is proved that Shoulder diameter, Elbow diameter help to increase 110 meter hurdles performance.

Skin Fold measurements

The co- efficient of performance in 110 meter hurdles shows that Biceps skin fold and Thigh skin fold has negative and significant correlation with 110 meter hurdles performance at the .01 level. Therefore athlete who got highest score on the performance of 110 meter hurdles has significant relationship between the selected anthropometric variables Biceps skin fold and Thigh skin fold also help to increase 110 meter hurdles performance.

Physical Fitness components: (Endurance, strength, agility and speed)

Among the physical fitness variables co- efficient of correlation of performance in 110 meter hurdles shows that 50 yards dash, 600 yards run, Arms Pull-up and Shuttle run 10x4m have significant correlation with performance in 110 meter hurdles at the 0.1 level. Athlete who got highest performance in 110 meter hurdles has significant relationship between the selected physical fitness variables (50 yards dash, 600 yards run and Shuttle Run 10x4m, arms pull-ups). It is proved that 50 yards dash, 600 yards run and, Arms Pull-up test, Shuttle Run 10x4m also help to increase 110 meter hurdles performance.

Conclusion

Combined Contribution of selected Anthropometric and Physical fitness Variables to the 110 meter hurdles event performance. It is evident from the combined contribution of the height, Leg length, Shoulder circumference, Hip circumference, Shoulder diameter, Elbow diameter, thigh skin fold &Biceps skin fold and physical fitness variables (50 yards dash, 600 yards run and Shuttle Run 10x4m, Arms pull-ups) are significantly related to the performance in 110 meter hurdles. Therefore athlete who got highest performance in 110 meter hurdles test has significant relationship between the selected anthropometric and physical fitness variables. It is proved that these anthropometric and physical fitness variables help to increase 110 meter hurdles performance.

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