Relationship between Selected Fitness and Anthropometrical Parameters in Sports Population

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ABSTRACT

The aim of the present work was to find out the relationship between selected fitness variables and anthropometrical parameters. The subjects for this study were 105 male sportspersons belonging to various sports groups of SAI schemes. The average age of the subjects was 15.54 years. Fitness parameters selected for the study were 30 meter dash (speed), 5, 10, 15, meter shuttle run (agility) and 800 meter run or walk test (endurance) and anthropometrical variables were height, weight, arm length, leg length, and foot length. There is a significant relationship between selected anthropometric and fitness variables. The 'r' values found are statistically significant in almost all parameters. The height variable is considered to be the highly related variable with performance in 30 meter run, 5, 10, 15 meter agility run and 800 meter run and walk test with a value of 0.50, 0.574 and 0.408, respectively, in the subjects.

INTRODUCTION

Sports performance is an end product of complex combination of several factors. Certain factors are dominating and other supportive. Ability to run at high speed, agility and endurance is considered to be important prerequisites for achieving performance in competition or to improve performance determining factors, during training, for almost all the sports events.

Though the training is equally important to develop these abilities, but at the higher level of competitions, where the training is given to all the individuals, anthropometrical variables are of fundamental importance.

Nelson (1982) conducted a study, to examine the AAHPERD test, on a sample group of 12,362 boys and girls, aged 6 through 17 years, and found that age and body size characteristics are related to the test performance, on all test items.

Rajni (1994) studied twenty three top ranking weightlifters belonging to three broad weight categories such as, light class (N= 8), medium class (N=10) and heavy class (N=5). In the selected anthropometric measurements the weight

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lifters of light, medium and heavy classes showed a gradient of increasing body measurement i.e. the light class being the lightest and shortest, the heavy class being the heaviest and the tallest, with the middle class falling in between the both. f-ratio values were found to be highly significant in all the anthropometric variables such as age, body weight and triceps among weightlifters of different weight categories.

Ward et al (1979) reported anthropometric data relative to the performance of three masters and seven first-class Olympic weightlifters and found a positive relationship between body weight and the amount of weight lifted. Similar linear relationship was reported by Tappen (1950).

Brisswalter (1996) conducted a study to assess the relationship between running economy, stride length, and body dimensions. Body weight, body fat, height, sitting height, low extremity length (height - sitting height), relative low extremity length, leg length, thigh length, foot length were determined. The results indicated an effect of the running speed on the relationship between body dimensions, stride length and VO_2.

Shukla and Sharma (1996) conducted study on Basketball players and found no relationship between arm length, explosive arm strength and leg length and explosive leg strength of Basketball players.

METHODOLOGY

The subjects for this study were 105 Boys of average age group of 15.54 years from different games and sport viz. Hockey(27), Gymnastics(5), Fencing(28), Wushu(12), Judo(28) and Athletics(5) etc. of various SAI schemes.

Following tests for evaluating fitness parameters and anthropometric parameters were conducted.

Fitness Test:	Measuring Unit
• 30 meter Dash (Speed)	Seconds
• 5, 10, 15, meter shuttle run (Agility)	Seconds
• 800meter run or walk test(Endurance)	Seconds
Anthropometric Variables:	
• Height	Centimeters
• Weight	Kilograms
• Arm length	Centimeters
• Leg length	Centimeters
• Foot length	Centimeters

Statistical Analysis

The Pearson's product moment correlation coefficient (r) was calculated to find the relationship between selected physical fitness and anthropometric parameters.

RESULTS & DISCUSSION

Table -1: Mean & SD values of 30 meter run, 5, 10, 15m agility run & 800 meter run test performance and anthropometric measurement of the sports population.

	30 meter run (sec)	5, 10, 15 meter agility run (sec)	800 meter run (sec)	Height (cm)	Weight (kg)	Leg length (cm)	Arm length (cm)	Foot length (cm)
Mean	4.97	15.69	196.63	163.93	53.22	88.80	73.39	25.23
SD	0.50	1.35	42.66	10.20	10.83	4.77	7.15	1.70

Table -2: Relationship between anthropometrical variables and 30 meter speed test, 5, 10, 15 meter agility test and 800 meter run test performance.

	30 meter run test Subjects (N=105)	5,10,15 meter agility test Subjects (N=105)	800 meter run test Subjects (N=105)
Variables	**'r' value**	**'r' value**	**'r' value**
Height	-0.50*	-0.574*	-0.408*
Weight	-0.38*	-0.448*	-0.198*
Leg length	-0.245*	-0.195*	-0.232*
Arm length	-0.356*	-0.397*	-0.349*
Foot length	-0.223*	-0.442*	-0.149*

Significant at 0.5 level

* Negative sign of correlation is due to the fact that running event performance is in terms of time.

In Table no. 2, it is evident that there is a significant relationship between 30 meter run performance and height (-0.5), weight (-0.38), leg length (-0.245), Arm length (-0.356) and foot length (-0.223) in the subjects.

The relationship of 5,10,15 meter agility run performance with almost all the anthropometric measurements, except leg length, has been found significant.

The relationship values of -0.408, -0.198, -0.232 and -0.349 between 800 meter run and height, weight, leg length, arm length and foot length, respectively, are found to be significant.

The height variable is considered to be the highly related variable with

performance in 30 meter run, 5, 10, 15 meter agility run and 800 meter run and walk test, with a value of 0.50, 0.574 and 0.408, respectively, in the subjects.

The study conducted by Nelson (1982) and Ward (1979) supported the result of the present study that there is a significance relationship between physical parameters and selected fitness variables.

CONCLUSION

There is a significant relationship between selected anthropometric (Height, Weight, Leg length, Arm length and foot length) and fitness variables (30 meter run performance, 5,10, and 15 meter agility run performance, 800 meter run performance) in the sports population of average 16 years age.

REFERENCES

Brisswalter, J., Legros, P., Durand, M. (1996): Running economy, preferred step length correlated to body dimensions in elite middle distance runners. J Sports Med Phys Fitness. 1996 Mar; 36(1):7-15.

Nelson, J. K. (1982): The function of age, gender, and body size characteristics on physical fitness performance. Dissertation Abstracts International, 43(07), 2276A, University of Houston Campus.

Rajni (1994): A comparative study of fat assessment in top ranking Indian weight lifters. NIS Scientific journal Vol.-17 No. 2(23-29)

Shukla, N.B. & Sharma, S.S. (1996): Anthropometric and explosive strength relationship of arm and leg length of state level basketball players. Indian Journal of Preventive & Social Medicine. Jan-June; 27(1&2): 7-10

SNIPES Journal, Vol. 10, No. 1 & 2. NS NIS Patiala

Tappen, N.C. (1950): An Anthropometric and constitutional study of championships weightlifters. Am. J. Phys. Anthrop., 8: 49-64.

Ward, T., Groppel, J. L. & Stone, M. (1979) Anthropometry and performance in master and first class Olympic weightlifters .J. sports med. Phys. Fit., 19:205-212.

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