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Prediction of performance ability of 100 m sprinters in relation to selected motor fitness components

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Abstract
The study was conducted to study the prediction of performance ability of 100 m sprinters in relation to selected motor fitness components. The study was conducted on 20 male 100 m sprinters aged between 14-18 years were randomly selected from selected from Govt. Co-ed Secondary Schools, Delhi. Keeping in mind the availability of equipment's, acceptability to the subjects and legitimate time for collecting data, 50 yard run for speed, pull ups for muscular strength, bent knee sit ups form muscular endurance, standing broad jump for muscular power, 600-yard run/ walk test for cardio-respiratory endurance, sit and reach test for flexibility and 4×10 yards shuttle run for agility were selected as the motor fitness components for the study. These tests were selected as they are directly related to the performance ability of an athlete. The findings of the study showed that the selected motor fitness components *viz* speed, muscular strength, muscular endurance, muscular power, circulatory-respiratory endurance, flexibility and agility plays a vital role in predicting 100 m sprint performance i.e. the selected motor fitness components contributes 76.90% in predicting the 100 m sprint performance.

Keywords: Speed, muscular strength, muscular endurance, muscular power, circulatory-respiratory endurance, flexibility and agility

Introduction
Today sports have become inseparable phenomenon of our social life. It is at the apex of human civilization because of its trials, competitive events and the scope of improving personality. The acquisition of new knowledge for betterment of performance of human being in relation to physical, motor and psychological qualities is in process of saturation. To strive for skill barrier is a million-dollar question for the experts in sports. In the process they also explore the field of psychology and enlisted certain psychological parameters which do influence sports performance.

The physical fitness is the sum of five motor abilities namely speed, strength, flexibility, endurance and coordinative abilities and their complex form like strength endurance, maximum strength, explosive strength, maximum speed and agility are the basic prerequisites of human motor action. Therefore, the sports performance is depended to a great extent on these abilities. The improvement and maintenance of specific physical fitness or condition is the main aim of sports training. Each sport requires different type and level of specific fitness as a result different type of fitness training is required for different sports. Some sports like running requires a very high level of endurance and low level of other motor abilities, sports like shooting and archery do not require high level of physical fitness.

After going through the literature research scholar found that there is need of prediction study on sprinting performance related to their motor fitness variables at state level players and hence this study was undertaken

Procedure and Methodology
The study was conducted on 20 male 100m sprinters aged between 14-18 years were randomly selected from selected from Govt. Co-ed Secondary Schools, Delhi. Keeping in mind the availability of equipment's, acceptability to the subjects and legitimate time for collecting data, 50 yard run for speed, pull ups for muscular strength, bent knee sit ups form muscular endurance, standing broad jump for muscular power, 600-yard run/ walk test for cardio-

respiratory endurance, sit and reach test for flexibility and 4×10 yards shuttle run for agility were selected as the motor fitness components for the study. These tests were selected as they are directly related to the performance ability of an athlete.

Statistical analysis

To predict the performance of ability of sprinter in relation to selected motor fitness components, the Pearson product moment correlation (r), multiple regression and regression analysis was employed.

Analysis of data and findings of the study

Table 1: Descriptive analysis of selected motor fitness components of 100 m sprinters

Variables	Mean	Std. Deviation
Speed	6.33 sec	0.23
Muscular Strength	10.10	1.65
Muscular Endurance	51.05	6.88
Muscular Power	2.61 m	0.13
Circulatory Respiratory Endurance	102.86 sec	9.62
Flexibility	5.05 cms	4.52
Agility	10.73 sec	1.11

Table- 1 reveals the descriptive analysis (Mean ± S.D.) of selected motor fitness components of 100m sprinters. The mean speed score obtained was 6.33±0.23 sec, mean muscular strength score obtained was 10.10±1.65, mean muscular endurance score obtained was 51.05±6.88, mean muscular power score obtained was 2.61±0.13 m, mean circulatory-respiratory endurance score obtained was 102.86±9.62 sec, mean flexibility score obtained was 5.05±4.52 cms, and the mean agility score obtained was 10.73±1.11 sec.

Table 2: Relationship of selected motor fitness components with 100 m sprint performance

Variable	Pearson Correlation (r)						
	Speed	Muscular strength	Muscular endurance	Muscular power	Circulatory respiratory endurance	Flexibility	Agility
100 m Sprint Performance	0.661*	-0.389	-0.661*	-0.684*	0.723*	0.043	0.711*

*Significant at 0.05 level of significance

Table 2 reveals a significant correlation between 100 m sprint performance with speed, muscular endurance, muscular power cardio-respiratory endurance and agility as the coefficient of correlation (r) were found to be 0.682, 0.661, 0.684, 0.723 and -0.711 respectively at $p \leq 0.05$ while no significant correlation was found between 100m sprint performance with muscular strength and flexibility.

Table 3: Regression analysis between dependent variable (100 m sprint performance) and independent variables (motor fitness components)

Model	R	R Square	F	Sig.
1	0.877	0.769	5.712**	0.001

**Correlation is significant at the 0.001 level (2-tailed)

It is evident from Table 3 that the R value obtained is 0.877, which indicates a high degree of correlation between the observed and predicted values of dependent variables i.e. the motor fitness components. While the R Square value, which represents the total variation in the dependent variable which can be explained by the independent variables, is obtained as 0.769, which indicates that the speed, muscular strength, muscular endurance, muscular power, circulatory-respiratory endurance, flexibility and agility explains the 76.90% of total variability in the 100 m sprint performance i.e. the selected motor fitness components contributes 76.90% in predicting the 100m sprint performance. The F-value in the above table also indicates that the selected motor fitness components reliably predict the 100 m sprint performance.

Conclusion

Based on the findings of the present study, it was found that the selected motor fitness components *viz* speed, muscular strength, muscular endurance, muscular power, circulatory-respiratory endurance, flexibility and agility plays a vital role in predicting 100 m sprint performance.

Hence further it is recommended that sport training experts and coaches use the findings of the present study in screening and identification of the talent for preparing the sprinters in their respective schools/ institutions or colleges etc.

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