Relationship of Selected Speed and Strength Variables of Indian Male Long Jumpers in Relation to Performance

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Abstract

The purpose of the study was to see certain speed and strength variables of long jumpers in relation to performance level. Thirty two male long jumpers of different level were taken as subjects for study. 10m fly run, 5 hops from six strides Run up, standing broad jump, 12 stride long jumps and full approach jump performance was recorded to study the full approach long jump performance in relation to speed and strength level of jumpers. The results indicate that 10 meter acceleration phase has Non significant relationship with long jump performance at the value of 0.162. Whereas standing broad jump with the value of 0.673, 5 hops from six strides Run up at the value of 0.624, standing broad jump, 12 stride long jump at the value of 0.786, show high correlation between strength and long jump performance at $p<.001$

Keywords: Speed, Strength, Performance.

Introduction

The long jump is an event of different styles. Among jumping events the long jump seems to be easy, but it is in fact a combination of different athletic skills. Quickness, speed and strength, flexibility, rhythm are the basic requirement for a good jumper. Long jumping begins with sprinting to the take-off point and finishes with high degree of flexibility and balance for an effective landing in to the pit.

According to **Jarver (1972)** long jump starts with a run -up aiming to accumulate maximum horizontal speed. The jumper attempts to approach the take-off board with extreme accuracy before becoming air borne with a minimum loss of momentum. **Bosen (1972)** reported that this event requires a run up of sufficient length to develop maximum controllable speed combined with effective sprinting at the take off. **Fred (1972)** stated that approach speed in the long jumping is important but he is also stated that the 100M sprint time is not

comparable with the result of long jumping because the long jumper speed requirement is decisive at a distance between 40M to 50M. Further he noted that higher the speed of approach run which jumper can maintain at the takeoff without a loss in the momentum, the better will be the resultant conversion of the approach speed at the take off. **Doherty (1984)** is of the belief that the practice organization for long jump should consider at least five factors i.e speed, power, skill, tendon, and tissue toughness and speed endurance. **Pfaff (1996)** pointed out that the tests for elastic strength such as timed hopping over the barriers and alternate bounding provide valid prediction.

Methodology

The main objective of the present study was to determine the relationship of speed and strength variables with Long jump performance. The study was conducted on 32 male log jumpers of National level. The age, height and weight of the subjects were recorded. After that the following fitness test were conducted on the jumpers for the assessment of their fitness level:

Speed

1. 10m flying run(seconds)
2. Last 10m in full approach(seconds)

Explosive Strength

1. Half Squad(kg)-Explosive strength

Explosive Strength

1. Standing broad jump(meters)
2. 5 Hops from 6 strides(meters)
3. Long jump from 12 strides(meters)

Sprint Endurance

1. 150m sprint (seconds)-sprint endurance

The data was analyzed by statistical package SPSS (version 19) for the calculation of Mean, SD. Multi Co-relation was applied to find out statistical relationships between the performance and fitness variables.

Results and Discussion

Table-I

Mean and SD Values of Physical Parameters of the Long Jumpers

Sl No	Parameter	Mean	SD
1	Age (Years)	22.53	±3.068
2	Height (Cm)	175.59	±6.690
3	Weight (Kg)	69	±7.878

Table-II

Mean and SD Values of Fitness Parameters of the Long Jumpers

Sl No	Parameter	Test	Mean	SD
1	Speed	10m flying run	1.0235	±0.09
		Last 10m in full approach (seconds)	1.0885	±0.12
2	Explosive Strength	Half Squad (kg)	211.5	±52.2
		Standing broad jump	3.124	±0.165
		5 Hops from 6 strides	19.1215	±2.268
			2.268471	
		Long jump from 12 strides	6.8875	±0.540
3	Sprint Endurance	150m sprint	16.6125	±0.716
4	Performance Variable	Long Jump	4.8575	±0.44

Table-III

Multi Co-Relations between Fitness and Performance Variable

	10m fly	Last 10m	150m	SBJ	5 hops from 6 strides	Jump from 12 strides	Jump from 16 strides	Maximum Half squat
	1							
10m fly	.923**	1						
Last 10 m	.695**	.748**	1					
150m	-.801**	-.837**	-.638**	1				
Sbj	-.419	-.532*	-.707**	.460*	1			
Jump from 12 strides	-.872**	-.913**	-.743**	.807**	.501*	1		
Jump from 12 strides	-.725**	-.832**	-.603**	.868**	.344	.743**	1	
Jump from 16 strides	.342	.446*	.110	-.286	-.039	-.365	-.349	1
Max Half squat	.139	.048	.643	.221	.871	.113	.131	

The 'r' values between long jump performance and selected speed and strength parameters are presented in table 3.

Performance and 10m fly

'r' value presented in table shows a non-significant negative co relation between 10 m fly and long jump performance with a value of 0.162.

Performance and Last 10m speed of approach run

The "r" value of last 10m approach run with long jump performance (-0.805p<0.01) shows statistically significant correlation. It shows that improvement in last 10 m approach run timing leads to improvement in long jump performance. Similar results were reorted by Siris (1983), Lohmn and voss, (1987), Bauersfeld et al .(1992). Muraki (1979).

Performance and 150m sprint

It is evident from the achieved 'r' value that 150m sprint time shows a significant correlation with long jump performance (-0.681). As per the norms

published by Bossy (1982) we found that Indian long jumpers have poor speed over 150m distance in comparison to international long jumper.

Performance and Standing broad jump

The correlation of standing broad jump with long jump performance shows highly significant value of 0.673 at $p<0.01$ level. Henson (1983), Siris et al (1983), Czingon (1990), Jonathon et al (1990), observed that standing broad jump test for leg power have influence on long jump performance.

Performance and 5 Hops from 6 strides

The found 'r' value (0.624) of 5 Hops from 6 strides is significantly higher than the table value. Henson (1983), Siris et al (1983), Tschiene (1980), Czingon (1990), Jonathon et al (1990), observed that 5 hops from 6 strides test performance have positive impact on long jump performance. Johnson (1980) concluded hoping and bounding as most advantageous for long jumpers and multiple jump can be used to improve jumping force.

Performance and jump from 12 strides

The results presented in the table 2 shows highly significant relationship with long jump performance and the achieved 'r' value is 0.786 at $p<0.01$ level. Doherty (1971) pointed out that the distance covered by jumper is strongly influenced by momentum gain through run up and it is converted in to forward –upward force by applying it on the take-off board.

Performance and Maximum Half Squat

The long jump performance correlation with half squad is found to be highly significant at 0.628 $p<0.01$ level. The achieved Half squat mean value were found to be higher in comparison to international norm prepared by Bossy (1982). On the basis of results presented in table 3 can conclude that the performance in long jump is determined by leg strength ability and speed endurance and acceleration over short distance does not show relationship with competition performance

Conclusion

The result of the study shows that:

1. The standing broad jump has significant correlation with Long jump performance.

2. Jump from 12 strides shows highly significant correlation with long jump performance.
3. Maximum half squat show significant correlation to the long jump performance.
4. Result proves that speed and strength are important parameters for long jump performance.
5. 10m fly and 150m has not significant correlation with long jump performance.

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