



A Comparative Analysis of Motor Fitness Components in Hurdlers and Jumpers



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ABSTRACT

The purpose of the study was to compare the Hurdlers and Jumpers in selected motor components namely Speed, Explosive strength, Flexibility, Agility. The subjects for this study were 15 Hurdlers and 15 Jumpers who were regularly training at DDA Athletic Academy situated in the complex of Jawaharlal Nehru Stadium, New Delhi. The age of the subject ranged from 17-22 years. The subjects had only one training schedule one in the afternoon, for the analysis of selected motor abilities, descriptive statistics and independent t-test was applied. The result is stated earlier that the hurdlers and Jumpers were not significantly different in three abilities namely Speed, Standing Broad Jump and Sit and Reach has been rejected and in respect of Agility is accepted.

KEYWORDS

Speed, Agility, Explosive strength, Flexibility, Athletics.

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INTRODUCTION

Motor components are critical to athletic performance and can be defined as the underlying physical capabilities that enable athletes to execute their sport-specific skills effectively. For jumpers, explosive strength is paramount, as it directly influences their ability to generate the vertical or horizontal force necessary for successful jumps. Additionally, speed plays a crucial role, particularly in events like the long jump and triple jump, where the approach run significantly impacts the jump distance. Coordination and balance are also essential, as they help athletes maintain control during take-off and landing.

In contrast, hurdlers must exhibit a unique combination of speed and agility. The ability to sprint while simultaneously clearing hurdles requires not only explosive power but also exceptional coordination and timing. Hurdlers must develop a rhythm that allows them to maintain their speed while adjusting their stride to clear each barrier effectively. This intricate interplay of motor components makes hurdling a complex event that demands a high level of athleticism.

The long jump is a complex event that requires a unique combination of physical attributes, technical skills, and mental fortitude. Athletes must generate significant horizontal speed during their approach run, which is then converted into vertical lift at the take-off board. This transition from horizontal to vertical motion is critical for achieving maximum distance. The long jump consists of three main phases: the approach, the take-off, and the landing, each of which demands specific motor skills and training focus.

Previous research has highlighted the importance of understanding the specific motor components that contribute to success in various athletic disciplines. Studies have shown that tailored training programs that focus on the unique demands of each event can lead to improved performance outcomes. However, there remains a gap in the literature regarding a direct comparison of the motor components between jumpers and hurdlers, particularly at the intermediate level. This study seeks to fill that gap by providing a comprehensive analysis of the physical attributes that differentiate these two groups of athletes.

By conducting this comparative analysis, we aim to provide coaches, trainers, and athletes with valuable insights into the specific motor components that should be emphasized in training programs for jumpers and hurdlers. Understanding these differences can lead to more effective training regimens, ultimately enhancing performance and reducing the risk of injury.

Methodology

Selection of Subjects

Fifteen Hurdlers and fifteen Jumpers training regularly at the DDA Athletic Academy were selected as subjects for the study. The age of the subjects ranged from 17 to 22 years. The subjects were under training at the Academy for the past 1 to 4 years.

Selection of the variables in the study was as follows:

S. No.	Variable	Test	Unit of Measurement
1	SPEED	50-meter dash	Seconds
2	AGILITY	10x4 Shuttle run	Seconds
3	EXPLOSIVE STRENGTH	Standing Broad Jump	Centimeters
4	Flexibility	Sit and reach	Centimeters

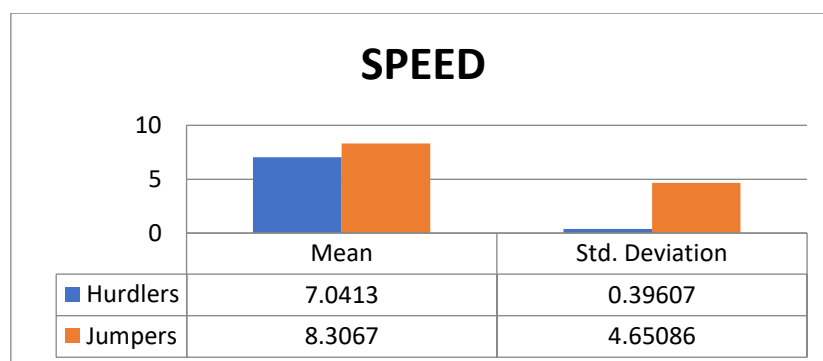
For testing the significance of difference in the selected variables among subjects t-test was applied. The level of significance chosen was 0.05 level of confidence, which was considered adequate for the purpose of the study.

FINDINGS

Table 1 Significance of difference between means of hurdlers and Jumpers in Speed

	Group	N	Mean	Std. Deviation	Std. Error Mean	t-ratio
Speed	Hurdlers	15	7.0413	.39607	.10226	0.30
	Jumpers	15	8.3067	4.65086	1.20085	
* Not significant at .05 level				t. _{.05} (28)=2.03		

From Table 1 it is seen that a difference of between the means of Hurdlers and Jumpers in Speed is not statistically significant as the 't' ratio of 0.30 is less than the table value of 2.03.



The means and standard deviations in respect of Hurdlers and Jumpers with regard to Speed are presented in Fig. 4.1.

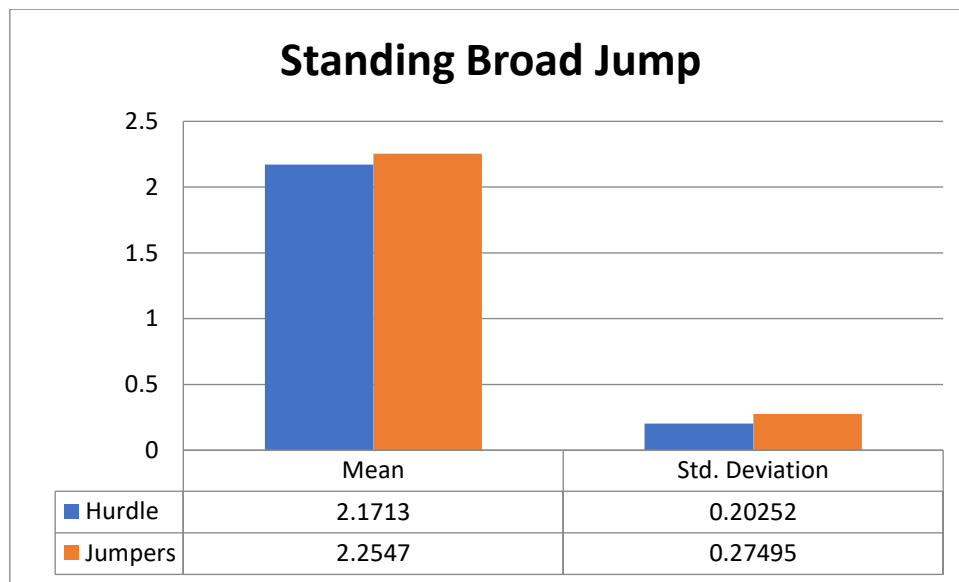
Table 2 Significance of difference between means of hurdlers and Jumpers in Standing Broad Jump

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean	t-ratio
Standing Broad Jump	Hurdle	15	2.1713	.20252	.05229	0.35
	Jumpers	15	2.2547	.27495	.07099	

* Significant at .05 level

$t_{.05}(28)=2.05$

The above Table 2 clearly shows that the difference between the means of hurdlers and Jumpers in statistically not significant in Standing Broad jump as the 't' ratio of 0.35 is higher than the table value of 2.03.



The means and standard deviations in respect of Hurdlers and Jumpers with regard to standing broad jump are presented in Fig. 4.2.

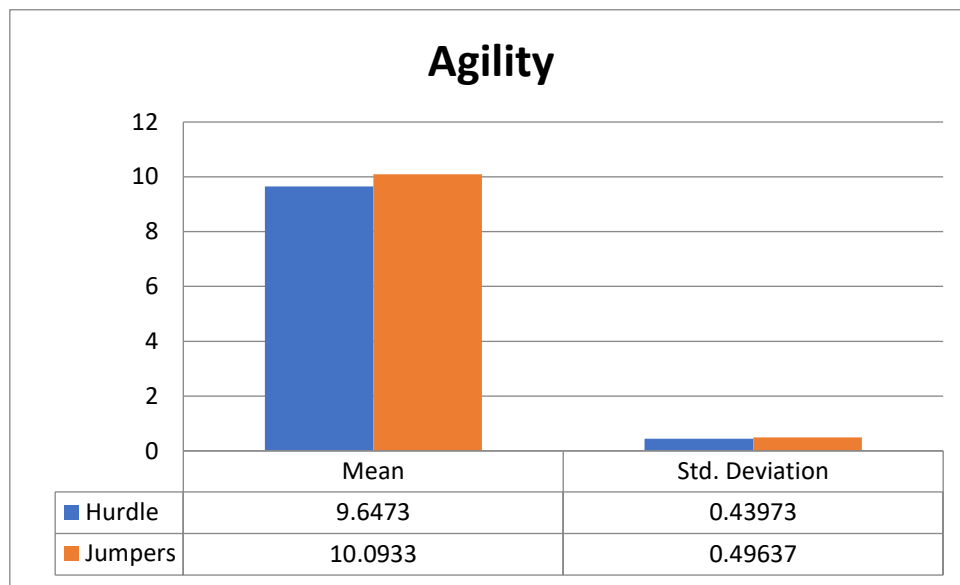
Table 3 Significance of difference between means of Hurdlers and Jumpers in Agility

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean	t-ratio
Agility	Hurdle	15	9.6473	.43973	.11354	0.015
	Jumpers	15	10.0933	.49637	.12816	

* significant at .05 level

$t_{.05}(28)=2.03$

The analysis of data in Table 3, in respect of Hurdlers and Jumpers in Agility shows that the difference in the means is statistically significant as the 't' ratio of 0.015 is more than the table value of 2.03.



The means and standard deviations in respect of Hurdlers and Jumpers with regard to Agility are presented in Fig. 4.3.

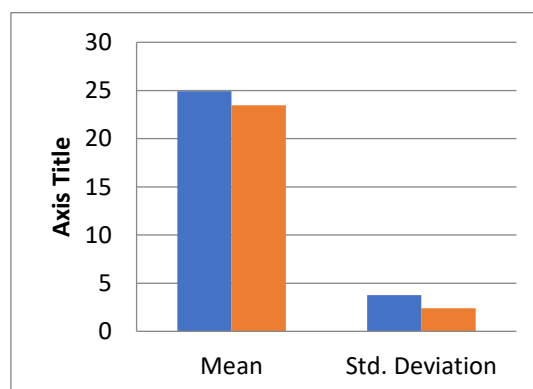
Table 4 Significance of difference between means of hurdlers and Jumpers in Sit and Reach

	Group	N	Mean	Std. Deviation	Std. Error Mean	t-ratio
Sit and reach	Hurdle	15	24.9333	3.76955	.97329	0.213
	Jumpers	15	23.4667	2.38647	.61618	

* Not significant at .05 level

$t_{.05}(28)=2.03$

The analysis of data in Table 4, in respect of hurdlers and Jumpers in Sit and reach shows that the difference in the means is not statistically significant as the 't' ratio of 0.213 is less than the table value of 2.03.



The means and standard deviations in respect of Hurdlers and Jumpers with regard to Sit and reach are presented in Fig. 4.4.

Discussion of Hypothesis

The hypothesis stated earlier that the hurdlers and Jumpers was not significantly differ in three abilities namely Speed, Standing Broad Jump and Sit and Reach has been rejected and in respect of Agility is accepted

DISCUSSION OF FINDINGS

The analysis of data using 't' test reveals that in one of the three of motor component a significant difference has been obtain between hurdlers and Jumpers. In each case the value of coefficient of correlation is less than the table value of 2.03

Motor component abilities have a direct relevance to sports performance. Performance in different games and sports, to a great extent, depends upon the level of motor component abilities of a sportsperson. The subjects selected for the study were Hurdles and Jumpers and the training program of both the groups is dominated by high intensity. In as much as the athletes in both the groups were in the process of gradual development (Intermediate level) and due to this the training means which they adopt probably brought about similar development except running over the hurdles which a hurdler does and a Jumpers does not do it. The pattern of performance of athletes in both the categories is more or less identical. The literature on sports training reveals that the chief method for developing motor component abilities is systematized and guided practice and the principle means is physical exercise. Since there is lot of uniformity in the sports training process in both the events and both are dominated by high intensity and that could be the main reason of no significant difference in the motor components ability selected in the study. Rejection of Hypothesis on Speed, Explosive strength, and Flexibility The hypothesis that jumpers and hurdlers would significantly differ in speed, standing broad jump, and sit and reach has been rejected. This indicates that both groups possess similar capabilities in these areas, suggesting that training regimens for both jumpers and hurdlers may not need to focus heavily on these specific attributes.

The acceptance of the hypothesis regarding agility suggests that this ability is a key differentiator between jumpers and hurdlers. Agility, which involves quick changes in direction and speed, is crucial for hurdlers as they navigate obstacles. This finding emphasizes the need for hurdlers to incorporate agility training into their routines to enhance performance.

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