

RELATIONSHIP OF SELECTED JUMPING PARAMETERS WITH 100 METERS SPRINTING PERFORMANCE



Physical Education

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ABSTRACT

The purpose of this study was to investigate the relationship among jumping parameters and speed performance in 100 meters. The study was conducted on a sample of 20 male athletes who were selected randomly. All athletes were regularly trained. The athletes were instructed to be adequately hydrated, fed, and rested prior to and during the testing day. Before each trial, subjects were allowed to perform an adequate standardized warm-up which included light jogging, a stretching routine and light jumping exercises. Regardless of testing modality, the subjects were requested to exert maximal effort in each test. A 2 minutes rest period was held between jumping trials to avoid the effects of fatigue. Pearson product movement correlation was used to find out the correlation of standing broad jump and vertical jump with 100 meter performance in seconds. The results revealed out that standing broad jump and vertical jump correlates significantly with 100-meter distance in seconds. Thus improvement in standing broad jump and vertical jump may also lead to the improvement in the sprinting performance of the athletes.

Introduction

The 100 meters is a sprint race in track and field competitions with shortest common outdoor running distance, it is one of the most popular and prestigious events in the sport of athletics. It has been contested at the Summer Olympics since 1896 for men and since 1928 for women. Implementing objective methods to assess physical performance has become a priceless component of athletic development, monitoring, and talent identification in sport. In terms of lower body exercises, for example, squats and vertical jumps appear to be most widely used to develop sprint performance (Badillo and Marques, 2010). It was suggested that, to develop optimal physical fitness training programs, it is important to know which physical parameters, and to what extent, are associated with performance (Nikolaidis et al., 2013). At the beginning of the sprint run, the ability to produce a great concentric force/power and to generate high velocity during acceleration is of primary importance (Bissas and Havenetidis, 2008). Therefore, the greatest transfer of the explosiveness to sprinting can occur. The sprinter also requires strong leg and back extensor muscles. Maximal strength, acquired in the squat and power clean exercises, has been significantly correlated with sprint performance (Wisloff et al., 2004). The amount of body-lean an athlete exhibits is directly proportional to upper body strength. In addition, it is also required to take into account the relationship between different horizontal jumping tests and sprinting performance. This comparison will provide necessary information concerning force production effectiveness for propulsion in order to perform an optimal sprinting step during the acceleration phase or the entire distance of 100 m.

Objectives

To find out the relationship of standing broad jump and vertical jump with 100-meter distance in seconds among sprinting athletes.

Hypothesis

It was hypothesized that both types of jumps (i.e. standing broad jump and vertical jump) would correlate significantly with speed performance in sprinting.

Methodology

In this chapter the procedure to be adopted for the selection of subject, selection of variables, criterion measurers, collection of data and statistical technique to be used has been described.

The selection of subjects

The subject of this study for this study were N=20 male sprinters between age group of 18 to 25 years selected randomly from lovely professional university, Phagwara (Punjab).

Selection of tools

For the measurement of vertical jump procedure of the JCR-test for measuring vertical jump was used. Standing broad jump procedure of the Canadian-test was used for measuring vertical jump.

Statistical technique

Pearson product movement correlation was used for finding out the relationship of standing broad jump and vertical jump with 100-meter performance in seconds.

Results and analysis

Table 1.1

Variables	N	Mean	SD
100- meter timing in seconds	20	13.41	1.56
Standing Broad Jump in meter	20	2.021	0.321
Vertical Jump in cm	20	9.23	1.211

Table 1.1 shows the mean and standard deviation of the variables. The mean value of 100- meter among the athletes was found 13.41 seconds. The mean value of standing broad jump was found to be 2.021 meter. The mean value of the vertical jump was found to be 9.23 centimeter.

Variables	Correlation	100-meter in seconds
Standing Broad Jump	Pearson correlation	.357
	Sig.(2-Tailed)	0.023
Vertical Jump	Pearson correlation	.245
	Sig.(2-Tailed)	0.032

Table 1.2

The table 1.2 shows the correlation of standing broad jump and vertical jump with 100 meter. The results revealed out that there was a positive correlation of standing broad jump with 100-meter in seconds as the 'r-value' was found to be .357. The results also revealed out that there was a positive correlation of vertical jump with 100-meter in seconds as the 'r-value' was found to be .245. Thus the null hypothesis of no difference among the variables was rejected.

Conclusion

The results revealed out that standing broad jump and vertical jump correlates significantly with 100-meter distance in seconds. Thus improvement in standing broad jump and vertical jump may also lead to the improvement in the sprinting performance of the athletes.

Recommendations

The study had several limitations what could affect further research. A larger number of subjects with much better sprinting quality would create greater statistical power. The experiment did not take into account the measure a single leg (Left or Right) jumping ability in order to express the differences of strength between limbs. Even a stronger relationship with all kinematics of maximum speed during acceleration could be detected. Further studies should consider the analysis of the rates of speed kinematics changes on a step-to step basis (Nagahara et al., 2014) with the division into smaller sections. Coaches of track athletes should consider the standing broad jump

and vertical jump as useful training exercises to improve acceleration which may lead to an improvement in sprint performance. However, standing broad jump and vertical jump need to be incorporated into a training study to validate the effectiveness of these exercises in attempting to improve sprint acceleration performance. Future research directions should include larger samples of elite sprinters and involve the continual monitoring of the physical attributes and sprinting performance of the sprinters in order to determine how changes in these physical attributes would relate to changes in 100 m sprint performance.

References

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