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Relative study of explosive strength and maximum leg strength between national level wrestlers and judokas

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Abstract

The purpose of the study was to find out the significant difference of Explosive Strength and Maximum Leg Strength between National Level Wrestlers and Judokas. For present study, total 30 male national players (15 each from judo and wrestling) with their age ranging between 19-27 years was selected randomly from Punjabi university, Patiala affiliated colleges. The explosive leg strength measure with the help of standing broad jump and maximum leg strength measure with the help of leg dynamometer. Unpaired t-test was employed. The level of significance 0.05 was set. The result shows that insignificant differences in both variables between National Level Wrestlers and Judokas.

Keywords: Explosive strength, maximum leg strength, wrestlers and judokas

Introduction

Judo is an Olympic sport where to perform inferior body actions need a certain explosive strength determined as much for the movement of athletes by tatami as for the implementation of technical entries, as for opposition to the opponent's activities. According to Stone *et al.* (2003) [5] the most critical aspects of sports performance occur in a very little time period (250 ms), therefore athletes develop abilities to produce larger amounts of force within this time, would reach to get a faster acceleration and higher speed. So it is unstated that the chance of applying more force in the shortest time possible when perform a specific act (either in arms or legs), is an attribute that can determine a success event at any time of a judo combat. However, the inability to evaluate quantitatively the explosive strength of inferior limb with several particular combat judo movements, becomes necessary to use a test, although non-specific, to determine the motor pattern of manifestation on the strength in the inferior limbs (Monteiro, *et al.*, 2014) [3].

It is clear that manifestation of the explosive force in the lower limbs (e.g., without countermovement jump) result: (1) combining the contractile capacity, understood as the concentric action of the agonist muscles without the use of muscle stretch-shortening cycle - SSC (Gollhofer *et al.*, 1987) [2]; and (2) the synchronization ability of the contraction of the fibers. However, it's currently accepted that the participation of the SSC increases the mechanical efficiency of the movements, that using followed eccentric muscle actions (immediately) by explosive concentric actions. This justifies the utility of expression elastic-explosive evaluation with recourse to countermovement jump (CMJ). The objective of this work is to analyze the levels of explosive lower body strength through the SJ and CMJ to observe differences between Top-Elite judokas and Elite judokas.

Explosive strength is a combination of strength and speed abilities. It can be defined as the ability to overcome resistance with high speed. It depending on the nature of combination of strength and speed. It is a form of dynamic strength, the following strength measures under study are: Explosive arm strength and Explosive leg strength (Singh, 2012) [4].

Explosive strength always finds expression in motor movement. A high percentage of movements in sports are of explosive nature and Involves overcoming of some external or of one's own body weight. Explosive strength therefore, is important in most of sports. It can be defined as the ability to overcome resistance with high speed. It is shown clearly in activities such as throwing and Jumping when athletes attempt to project themselves or an object as far and as fast as possible Explosive strength is readily measurable leg strength or power can be

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assessed either by a vertical leap or a standing broad jump. Here we present some examples in which explosive strength plays 'important role, start in sprint races, start in swimming, smashing in volleyball, goal shooting in handball, long jump, high jump, throws, fast bowling in cricket hitting six in cricket, most of the movement in kho-kho, smashing in badminton and tennis and so on wrestling weight lifting also require explosive strength It is the use of explosive strength that makes these sports Interesting exciting and popular not only among the sportspersons, but among the common people as well.

Methodology and Procedure

For present study, total 30 male national players (15 each from judo and wrestling) with their age ranging between 19-27 years was selected randomly from Punjabi university, Patiala affiliated colleges.

Table 1: Comparison of Mean and Standard Deviation of Explosive Strength between National Level Wrestlers and Judokas Players

Group	N	Mean	Standard Deviation	Standard Error mean	t-value
Wrestlers	15	2.25	0.28	0.07	1.20
Judokas	15	2.14	0.21	0.05	

*t'.05 (28) = 2.048

Table 1 statistically depicts that the mean and standard deviation with regard to Wrestlers national level players is 2.25 and 0.28 where as in case of Judokas national level players is 2.14 and 0.21 respectively. The calculated t-value

Selection of Variables

Variables selected for this study were:

1. Explosive leg strength
2. Maximum leg strength

Criteria of Measurement

1. The explosive leg strength measure with the help of standing broad jump. The subject is given three trials. The best trial is used as the final score of the test.
2. The maximum leg strength measure with the help of leg dynamometer.

Statistical Procedure

Unpaired 't' test was applied to find out the difference or to compare mean, standard deviation and standard error mean was computed to describe each variable statistically. The level of significance was set at .05.

Results and Discussions

(1.20) which is less than the tabulated t-value (2. 048) at 0.05 levels. So, it indicates that there is insignificant difference between wrestlers and judokas national level players for their Explosive strength variable.

Table 2: Comparison of Mean and Standard Deviation of Maximum Leg Strength between National Level Wrestlers and Judokas Players

Group	N	Mean	Standard Deviation	Standard Error mean	t-value
Wrestlers	15	157.80	26.67	6.88	0.58
Judokas	15	164.53	35.90	9.27	

*t'.05 (28) = 2.048

Table 2 statistically depict that the mean and standard deviation with regard to Wrestlers national level players is 157.80 and 26.67 where as in case of judokas national level players is 164.53 and 35.90 respectively. The calculated t-value (0.58) which is less than the tabulated t-value (2.000) at 0.05 levels. So, it indicates that there is insignificant difference between wrestlers and judokas national level players for their maximum leg strength variable.

Discussion of the Findings

Explosive Leg Strength: It was found that there was insignificant difference of explosive leg strength variable between national level wrestlers and judokas players. Because Judo and wrestlers including in same type of training and they do approximately same types of training that is why they do not show any significant difference in their explosive leg strength. These findings are supported by Bhat and Biswas (2015) [1] "A Comparative Study of Explosive Leg Strength and Maximum Leg Strength of Different Categories of Men Sprinters".

Maximum Leg Strength: The results of the study notify that there was insignificant difference between national level wrestlers and judokas players for their Maximum Leg Strength. Because Judo and wrestlers including in same type of training and they do approximately same types of training that is why they do not show any significant difference in their Maximum leg strength On the basis of analysis of the data,

investigator found that the earlier study of Bhat and Biswas (2015) [1] "A Comparative Study of Explosive Leg Strength and Maximum Leg Strength of Different Categories of Men Sprinters".

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