Shodh Sangam, Vol. 5 , No. 2 :June 2017

RELETATIONSHIP OF MAXIMUM STRENGTH, STRENGTH ENDURANCE, POWER AND FLEXIBILITY TO RUNNING SPEED

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ABSTRACT

The purpose of the study was to find out the relationship of maximum strength, strength endurance, power and flexibility to running speed. Twenty male sprinters of Lakshmibai National Institute of Physical Education, Gwalior were selected as subject for this study. The age of the subjects range from 18-21 years. All the subjects were boarders and had regular physical education classes as per scheduled program of the institute. The subjects were tested on maximum strength, strength endurance, power and flexibility. Maximum strength was tested by the leg dynamometer, strength endurance by half squat jump test, power by vertical jump test and flexibility by sit and reach test. Time was recorded for 50 mts. and 100 mts, and co-efficient of correlation was calculated to find out the relationship. The coefficient of correlation between 50 mts. and maximum strength, strength endurance, power and flexibility was -.477, -.634, -.657 and -.743 respectively which was found to be significant at .05 level. The co-efficient of correlation between 100 Mts. and maximum strength, strength endurance, power and flexibility was-:504, -446, -.495 and -.570 respectively which was also found significant at .05 level. The results of the study showed the maximum strength had greater positive correlation with 50 mts. (-.477) in comparison to 100 mts. (-.504). Whereas strength endurance, power and flexibility showed greater positive correlation with 100 mts. (-.446), (-.496) and (-.570) in comparison to 50 mts (-.634),- (-.657) and (-.743) respectively.

INTRODUCTION

Strength is a conditional ability. It depends largely on the energy liberation process in the muscle. It is the most important motor ability in sports as it is a direct product of muscle contractions. All movements in sports are virtually seen by muscle contractions and therefore strength is a basic for all major abilities, technical skill and tactical actions of an athlete.

Maximum strength is the highest possible resistance which a sportsman can overcome through voluntary contractions of the muscles. The maximum strength can

be isotonic or isometric (dynamic or static). The maximum strength is the highest possible tension which sportsman can develop through voluntary contraction.

Strength is a vital factor on which the sports performance depends. Depending upon the magnitude and type of resistance to be tackled in various sports. The sportsman of different games needs different level and type of strength to achieve good performance.

Strength is an element in several other performance traits. It is a contributor to power because Power = Force X Velocity. Increased strength results in the ability Ito apply more force and thereby it contributes to power. Strength is also a factor in muscular endurance, which is the ability of the muscle to resist fatigue while doing work.

Statement of the Problem

The purpose of this study was to find out the relationship of maximum strength, strength endurance, power and flexibility to running speed.

Delimitation

1. The study was delimited to 20 male sprinters of Lakshmibai National institute of Physical Education, Gwalior.
2. The study was delimited to maximum strength, strength endurance, power and flexibility.

Hypothesis

It was hypothesized that maximum strength, strength endurance, power and flexibility may have contribution in running speed.

Significance of the study

If it is found that the maximum strength, strength endurance, power and flexibility has significant contribution in running speed then the coaches can plan their schedule while keeping this in mind.

Athletes and coaches may emphasize on improving the performance of running speed by improving maximum strength, strength endurance, power and flexibility

STATISTICAL ANALYSIS OF DATA AND RESULT OF THE STUDY

Collection of Data

The data were collected on 20 male sprinters of Lakshmibai National Institute of Physical Education, Gwalior. In respect of maximum strength leg dynamometer was used were as for strength endurance, power and flexibility half squat jump, vertical jump and sit and reach test was used respectively.

Findings

The analysis of data pertaining to mean and S. D. is presented in table No. 1.

Table — 1

MEAN AND S. D. OF MAXIMUM STRENGTH, STRENGTH ENDURANCE, POWER AND FLEXIBILITY WITH PERRFORMANCE (50 Mts AND 100 mts)

Variables	Mean	Standard Deviation
Maximum Strength	I 72.7500	12.1909
Strength Endurance	84.5000	9.9868
Power	49.8000	3.2703
Flexibility	19.3500	1.8432
50 Mts.	6.1350	.2978
100 Mts.	11.4000	.2956

From the above table no. 1 it was found that means of maximum strength endurance, power and flexibility, 50 mts 100 mts run were 172.75 (S.D. + 12.19), 84.50 (S.D. +9.98), 49.80 (S.D. + 3.27), 19.35 (S.D. +1.84), 6.13 (S.D. + .29) and 11.40 (S.D. + .29) respectively.

The data pertaining to co-efficient of correlation among selected variable is presented in table no. 2.

Table —2

COEFFICIENT OF CORRELATION OF MAXIMUM STRENGTH, STRENGTH ENDURANCE, POWER AND FLEXIBILITY WITH PERRFORMANCE (50 Mts AND 100 Mts)

Variables	50 Mts	100 Mts
Maximum Strength	-.477	-.504*
strength Endurance	-.634	-.446*
Power	-.657	-.495*
Flexibility	-.743	-.570*

*Significant at 0.05 level r(0.05) (N-2) E0.444

From the above table no. 2 it is found that the correlation between 50 mts: and maximum strength was -.477, 50 mts and strength endurance was -.634, 50 mts and power -.657, and 50 mts flexibility was -.743, whereas correlation between 100 mts. and maximum strength was -.504, 100 mts. strength endurance was -.446, 100 mts and power was -.495 and flexibility and 100 mts. have -.570.

All the above components showed significant relationship with 100 mts. and 50 mtsat .05 level of significance.

Maximum strength had greater positive correlation with 50 mts (-.477) in comparison to 100 mts. (-.504), whereas in strength endurance correlation was positively higher in 100 mts. (-.446) in comparison to 50 mts. (-.634). In relation power and flexibility it was highly correlated positively with 100 mts (-.495) and (-.570) respectively in comparison to 50 mts. (-.657) and (-.743) respectively.

Discussion of Findings

The results of this study indicated that there was a positive correlation between 50 mts and variables of maximum strength, strength endurance, power and flexibility. Similarly findings indicated positive correlation between 50 mts and the selected variables. The high correlation between dependent and independent variables in this case is quite understandable because all the four parameters indirectly contribute for good performance in 50 mts and 100 mts. run. The results further indicated that in 50 mts run correlation was higher with maximum strength this process the facts that probably strength plays a dominants role in exerting force in creating forward momentum in other 3 variables, strength endurance, power, flexibility correlation was higher with 100 mts. performance. This may be mainly due to the fact that to continue the race over longer duration comparatively better endurance is required and power and flexibility indirectly assist in efficient movement.

Conclusion

1. Maximum strength, Strength endurance, power and flexibility have positive relationship to running speed.
2. Maximum strength has greater positive relationship with 50mts. in comparison to 100 mts.
3. Strength endurance, power and flexibility have greater positive relationship with 100 mts in comparison to 50 mts.

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