

ROLE OF SELECTED ANTHROPOMETRIC VARIABLES IN EXPLOSIVE STRENGTH OF FEMALE BASKETBALL PLAYERS

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ABSTRACT

The study has been aimed to identify the relationship between selected anthropometry and explosive strength and comparison of the same variables between District and sub-Division level Basketball female players. Forty District and sub-Division Basketball players having age of range 21-25 years were randomly selected from four clubs of three Districts of Uttar Pradesh. Among the anthropometric measurement Lower limb length, upper limb length, and circumferences of chest, thigh, calf, and bicep were measured. Leg and arm explosive strength were measured by vertical jump and medicine ball throw test respectively. After analyzing the data it was found that the District players were superior to sub-Divisional players in explosive strength. The limb length may be considered as one of the determining factors of explosive strength.

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INTRODUCTION

We often overlook body measurement/dimension during selection of players or same how neglect the inevitability of the size and shape of the body or its parts while expecting a better attainment in sports performance.

A too many sports activities are facilitated by the structure of the athlete irrespective of abilities like skills, techniques and anticipation etc. and so on. Yet there are many sports activities which are not dependent directly upon the structure.

Explosive strength is the ability of the sportsman to overcome certain resistance by the muscles with high speed. Explosive strength is a complex conditional ability and is combination of strength and speed. A proportion in range of motion in relation to length of bones and joints is also an important factor in explosive strength.

Explosive strength plays a vital role in Basketball. Specially leg explosive strength for jumping during shot and block, and arm explosive strength during long passes, chest passes are very important. Both actions are required equally during playing.

The study has been aimed to identify the relationship between selected anthropometric variables and explosive strength, and to compare the status of same variables between District and sub-Division level Basketball female players.

METHODOLOGY

Forty Basketball players were randomly selected from four standard clubs or team belonging to three different Districts of Uttar Pradesh. Out of 40 subjects 20 had participated in inter District and remaining 20 had participated in Inter-sub Division Basketball competitions. The age of the subjects were 21 through 25 years.

Lower limb length was measured from the difference between sitting height and standing height, upper limb length was measured from a cromion process to the tip of the third finger.

Chest circumference was measured at nipple level and at the end of normal expiration. Thigh and calf circumferences were measured at the point of maximal circumference. Bicep

circumference were measured twice, greatest girth when arm is maximally flexed and greatest girth when arm is fully intended. The average was recorded as bicep circumference.

The arm explosive strength was measured by medicine ball (2 kg) throw test. The longest distance was recorded from three trials. The leg explosive strength was measured by vertical jump test. The best jump was recorded among three trials.

FINDINGS OF THE STUDY

In order to compare the anthropometry and explosive strength between the groups of District and sub-Division female players the significance of variance of group means were found at .01 level of confidence in lower limb length and .05 level of confidence in vertical jump and medicine ball throw. In case of other variables the difference were insignificant (See Table 1).

TABLE I

SIGNIFICANCE DIFFERENCE BETWEEN MEAN SCORES OF BASKETBALL FEMALE PLAYERS AT DISTRICT AND SUB-DIVISIONAL LEVEL

Variables	District level	Sub-divisional level	σ DM	t-ratio
lower limb length (cm)	85.34	81.73	1.30	2.78**
Upper limb length (cm)	77.50	76.21	1.14	1.13
Chest circumference (cm)	82.32	82.52	1.42	0.14
Thigh circumference (cm)	48.07	47.14	1.21	0.77
Calf circumference (cm)	32.87	32.20	0.6	1.02
Bicep circumference (cm)	25.91	25.15	0.87	0.87
Vertical jump (cm)	54.89	49.43	2.58	2.12*
Medicine ball throw (mt.)	11.28	09.91	0.67	2.04*

*significant at .05 level , ** significant at .01 level

t.05 (44) =2.02 , t.01 (44) =2.69 ,

The co-efficient of correlation between the variables of vertical jump and lower limb length was highly significant at .01 level of confidence and the correlation between vertical

jump and medicine ball throw was significant at 0.5 level of confidence. There was also a positive, but insignificant correlation found between the variables of vertical jump and thigh and calf circumference (vide table -2)

TABLE 2

COEFFICIENT OF CORRELATION OF VERTICAL JUMP WITH LOWER LIMB LENGTH, MEDICINE BALL THROW AND CIRCUMFERENCE OF THIGH AND CALF.

Variables	Lower limb length	Thigh circumference	Calf circumference	Medicine ball throw
Vertical jump	0.64**	0.21	0.17	.344*

* Significance at 0.05 level , ** Significance of .01 level
 $r_{.05(44)} = .291$, $r_{.05(44)} = .376$

The coefficient of correlation between the variables of medicine ball throw with upper limb length and chest circumference was highly positive and significant at .01 level of confidence. There was also positive correlation between the variables of medicine ball throw with bicep circumference but insignificant (See Table 3)

TABLE 3

COEFFICIENT OF CORRELATION OF MEDICINE BALL THROW WITH UPPER LIMB LENGTH, BICEP AND CHEST CIRCUMFERENCE

Variables	Upper limb length	Bicep Circumference	Chest Circumference
Medicine ball throw	0.71**	0.07	0.47**

** Significance of .01 level , $r_{.05(44)} = .376$

DISCUSSION

The District level female players are superior to sub-Divisional players in vertical jump. The relationship between lower limb length and vertical jump was significant ($r = .64$), a significant difference in lower limb length between District and sub-Division players was found (table-1). Hence it may be inferred that the District level players were better than sub-Divisional players in vertical jump due to greater limb length. The relationship between leg explosive strength and arm explosive has indicated their inter dependence.

The research work of Brown et al. (4) and Cluthetal (5) show in their study that vertical jump can be improved by developing muscular strength without sacrificing strength through training. In this study also the district players may be better in vertical jump due to greater training age.

The District level female players are superior in medicine ball throw to sub-Divisional female players. The relationship between appear limb length and medicine ball throw was significant ($r=.71$) and the mean difference of arm length (not significant) between district and sub-divisional female players are better in arm explosive strength due to greater arm length.

The relationship between chest circumference and medicine ball throw was highly significant ($r=.47$). The significant result of arm explosive strength may have been influenced by the pectoralis muscles. The pectoralis muscle commonly known as throwers muscles and the source of explosive strength.

As quoted from David Lamb (3) Increase the arm length or leg length would be of no use in improving power unless that strength somehow enable to movement to be completed rapidly, from the findings of this study no significant relation between girth and explosive strength was found. This re-establishes the fact quoted above of David Lamb.

CONCLUSIONS

1. The limb length is one of the determining factors in exerting explosive strength.
2. A continuous training may help in the improvement of explosive strength of arm and leg.

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