

## A COMPARATIVE STUDY ON THIGH AND LOWER LEG LENGTH OF HIGH AND LOW PERFORMANCE VOLLEYBALL PLAYERS

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### ABSTRACT

Thigh and lower leg length determines the vertical propelling force generated through the bony levers of the lower body. Thus it is presumed that greater size of these lower extremities will give advantage in vertical jump to the individual. Vertical jump is a very important determinant of a volleyballer's performance. Fundamental skills of volleyball like servicing, passing, setting, smashing and blocking, have specific requirement of this ability. The purpose of this research work was to compare the Thigh and lower leg length of high and low performance Indian volleyball players. 50 subjects of each of high and low performance volleyball players' data was taken for analyzing the Thigh and lower length. High and low performance volleyball players were selected from Senior national, All India inter-varsity, zone, State, North zone, Inter-varsity, District tournaments. Z-test analyses with one tail test, concluded the mean Thigh and lower leg length, of high performance volleyball players to be significantly greater than the mean thigh and lower leg length of low performance volleyball players.

**Keywords:** thigh length and lower leg length

### INTRODUCTION

The Competitive sports demand event specific physique and body composition to achieve the success. The segmental length and breadth determines the leverage, possessed by the body (positions of fulcrum and various lengths of load and effort arms) which in turn affects the final out-come of force created by muscles and its ultimate exploitation for the purpose of motions. Hirata. (1966), suggested that a nation with people whose general physique is limited to the characteristics of champions in certain events must concentrate their sports training on those specific events only. He also concluded that Japanese with small body-builds are best for gymnastics, long-distance running, boxing and weight lifting etc. whereas the Americans who are large and lean are best for basketball, volleyball, swimming, long jump, short and middle distance running. Fundamental skills of volleyball like servicing, passing, setting, smashing and blocking, have specific requirement of thigh and lower leg length. The purpose of this research work was to assess the significant difference in the thigh and lower length of high and low performance volleyball players

### Selection of Subjects

Keeping in view the objectives of this study 50 subjects each from high and low performance volleyball players were selected.

High performance volleyball players were selected from;

Senior national tournament held at "Choutala", Haryana in Nov. 2002

All India inter-varsity championship finals held at "Ajmer" 17<sup>th</sup> to 22 Nov., 2002.

East & Northeast zone championship held at "Agra" from 16<sup>th</sup> to 21 Nov., 2002.

Low performance volleyball players were selected from;

State championship held at "Moradabad" in October, 2002.

North zone championship held at "Gadhwali" Uttaranchal University, October, 2002.

Inter-varsity tournament held at "Ajmer" in Nov., 2002.

District tournament Moradabad, 2002.

### Collection of Data

Thigh length

The subject was made to stand erect with weight equally distributed on both legs. Trochanterion and tibial lateral of the right leg were marked. The distance between these two points was measured in cms with the help of measuring tape.

Lower Leg Length

The subject was made to stand erect with weight equally distributed on both legs. Tibiale of the right leg was marked. The distance between tibiale and floor was measured in cms with a measuring tape.

**STATISTICAL PROCEDURE**

Z- test was used to test the significant difference in Thigh and lower length of high and low performance volleyball players at 0.05 level of significance.

TABLE -1  
THIGH LENGTH

Measure	High-performance volleyball players	Low-performance volleyball players
Mean	48.24	45.18
Standard Deviation	3.08	1.96
Obtained value $ Z $	5.88*	
The mean of High performer is > than mean of Low performer $\bar{X}_1 > \bar{X}_2 = 6.77\%$		

\*\* Z value for one tail test to be significant at 0.05 level 1.64

Table-1 Shows significant obtained Z value for one tail test, which leads us to conclude that the mean thigh length of high performance volleyball players is significantly greater (6.77%), than the mean thigh length of low performance volleyball players.

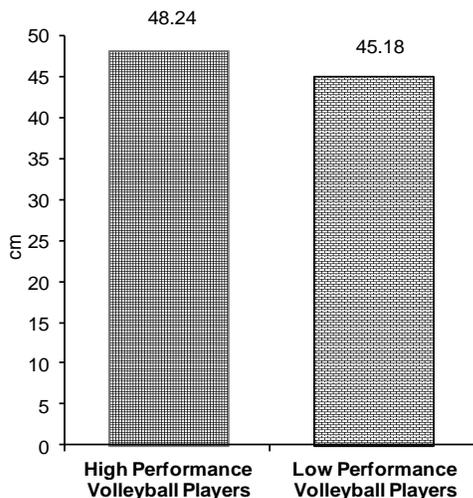


Fig.1: The mean Thigh length of High and Low performance Volleyball players

TABLE- 2  
LOWER LEG LENGTH

Measure	High performance Volleyball players	Low performance Volleyball players
Mean	53.70	50.30
Standard Deviation	3.56	2.45
Obtained value $ Z $	5.57*	
The mean of High performer is > than mean of Low performer $\bar{X}_1 > \bar{X}_2 = 6.76\%$		

\* Z value for one tail test to be significant at 0.05 level 1.64

Table-2 Shows significant obtained Z -value for one tail test, which leads us to conclude that the mean lower leg length of high performance volleyball players is significantly greater (6.76%), than the mean lower leg length of low performance volleyball players.

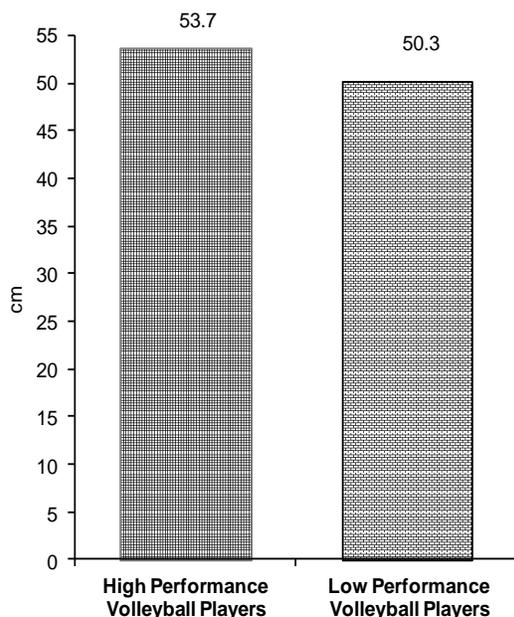


Fig.2 : The mean Lower leg length of High and Low performance volleyball players

#### DISCUSSION OF FINDINGS

Results shows the mean Thigh and lower leg length of High performance volleyball players to be significantly (6.77%), (6.76%), greater than the low performance volleyball players. Thigh and lower leg length determines the vertical propelling force generated through the boney levers of the lower body. Thus it is presumed that greater size of these lower extremities shall be advantageous for the vertical jump of the individual as vertical jump is a very important determinant of a volleyballer's performance. Sodhi et al. (1990) conducted a study on the north Indian junior volleyball players aged between 16 to 18 years. The results were based on the cross-sectional data of 90 volleyball players and 94 control subjects. The data was divided age-wise into three subgroups of each category. The results of the study revealed that the volleyballers in each age group were significantly taller and heavier than the controls. But amongst volleyballers the difference in height were found to be statistically non-significant between the three age group. The possibilities of developing national and international level aspirants from amongst the players in the study were also discussed. The volleyballers in each age group possessed considerably greater length of their trunk, broader shoulders and hips, wider humerus and femurs, greater size of hand span, larger chest, upper arm, thigh and calf circumference than the controls. Sodhi and Sidhu (1984) noted that the players in the Indian national volleyball team dominated other groups in all anthropometric measurements. They were lighter in proportion to stature with proportionately shorter trunks, longer lower extremities, smaller chest, and narrow hips. The rating of endomorphic and mesomorphic components was lower, but that of ectomorphic component was higher in their case. They had greater musculo-skeletal tissue in the thigh relative to the upper arms and possessed wider knees relative to the elbows than players of lower standards however; the amount of body fat was least in them. The state level volleyballers, when matched with the controls, showed almost the typical body characteristics as those of the national team players, but with a smaller degree of pronouncement than the latter Mokha and Sidhu (1988), took anthropometric measurements of Indian female volleyball players having International level of participation. They found that the volleyballers were taller and heavier than the controls. The taller stature of volleyball players was mainly due to the longer lower extremity

because the mean values of the sitting height in both the groups were almost comparable. Upper extremities were also longer for volleyball players and they also possessed broader shoulders, wider knees and wrist. Likewise in Basket ball Shamim Pervez (2002), observed High performance players of India to have greater Thigh and lower leg length than their low performing counter parts.

#### REFERENCES

- Hirata, Kin-Itsu. (1966). "Physique and age of Tokyo Olympic Champions. Journal of Sports Medicine and Physical Fitness,
- Sodhi et al., (1990) Kinnanthropometric characteristic of Indian junior volleyball players. In Origins of kinanthropometry, Patiala.
- Mokha and Sidhu, .(1988) "Physique and body composition of Indian female Volley ball players at different levels of competition". In O.G.Eiben (Ed), current development in Kinanthropometry. Humanbiologia Budapestensis, 18, 193-201
- Pervez Shamim et al. (2002) "A Comparative study of selected physical and physiological parameters of high and low performance Basketball players" Completed PhD. Thesis Department of Physical Education, A.M.U., Aligarh.

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