

# RELATIONSHIP BETWEEN BODY MEASUREMENTS AND SPIKING ABILITY OF VOLLEYBALL PLAYERS

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**ABSTRACT:** The present study investigated the relationship between various body measurements and spiking ability of university level Volleyball Players. For the purpose of the study, thirty volleyball players were selected as subjects from the North Zone Inter-University Volleyball Tournament. The body measurements were taken with the help of weighing machine, stadiometer and anthropometer. The performance of the subjects was measured in terms of Spiking ability of the players during the match. Product moment method for inter-correlation was applied. The measurements i.e. weight, height, trunk length, leg length, fore-leg length, arm length, upper- arm length, fore- arm length have been found to possess positive and significant correlation with the spiking ability at 0.05 and 0.01 levels. The relationship for sitting height was significant only at 0.05 levels. But, the relationship for thigh and foot length was not statistically significant. The results showed that increase in most of body measurements contribute towards the better spiking ability.

**Keywords:** Spiking Ability; Body Height; Body Weight; Body Lengths.

## 1. INTRODUCTION

### 2.

Volleyball is a complex game of simple skills. It is a sport played by two teams consisting of 12 players each on a playing court, divided by a net. The object of the game is to send the ball over the net in order to ground it on the opponent's court and to prevent the same effort by the opponent. A team is allowed only three touches of the ball before it must be returned over the net. As a purely rebound ball game (you can't hold the ball), volleyball is a sport of constant motion. The basic pattern of movement in making an attack includes a dig (an underarm pass made with the forearms), a set (an overhead pass made with the hands), and a spike (the overhead attacking shot). Teams can also try to block the opponent's spike as the ball crosses the net [1]. So it is essential for the players to possess physical fitness, physique and physiological parameters that allow them to play their roles most effectively [2], [3].

Vertical jump is a major determinant of volleyball performance and many researchers have studied different aspects of vertical jumping. According to [4], the factors that affect vertical jump are height reached by the center of gravity, time required for execution, and the spatial orientation of the corporal segments. The research by Japan Volleyball Association demonstrated the significant correlation between the vertical jumping index and the competitive ability of the volleyball players. It was found that the jumping ability had a positive correlation with the number of spiking, and the total success rates of spiking, blocking and serving in a game [5].

Lower body power, speed, and agility are important indicators of volleyball performance [6]. Volleyball requires athletes to be explosive in the lower limbs; this is especially emphasized in the front row hitting positions when attacking on offense or blocking on defense. Vertical jump emphasizes lower body power, and it is known that  $\text{Power} = (\text{Force} \times \text{Distance}) / \text{Time}$ . Vertical jump is an anaerobic explosive movement that requires recruitment of the highest threshold motor units [7].

An athlete's anthropometric and physical characteristics may represent important prerequisites for successful participation in any given sport [8]. Indeed, it can be assumed that an athlete's anthropometric characteristics can in some way influence his/her level of performance, at the same time helping to determine a suitable physique for a certain sport [9]. It has been well established that specific physical characteristics or anthropometric profiles indicate whether the player would be suitable for the competition at the highest level in a specific sport [10], [11], [12], [13]. Therefore, the present study investigated the relationship between various body measurements and spiking ability of university level Volleyball Players

## 2. METHODOLOGY

**2.1 Sample:** Sample consists of 30 Volleyball players as subjects from the North-Zone Inter-University Tournament. Their age ranged between 18 to 28 years. They were purposively selected to act as subjects.

**2.2 Criterion Measures:** The body weight was measured with the help of weighing machine and heights with the help of stadiometer. The measurements i.e., trunk length, leg length, fore-leg length, arm length, upper- arm length, fore- arm length, thigh length and foot length were taken with the help of anthropometer.

The performance of the volleyball players were measured in terms of Spiking ability of the volleyball players during the match.

### 3. STATISTICAL ANALYSIS

Pearson's Product moment method for inter-correlation was used to determine the relationships between selected variables.

### 4. RESULTS

The results of the study are presented in the Table-1. The measurements i.e. weight, height, trunk length, leg length, fore-leg length, arm length, upper- arm length, fore- arm length have been found to possess positive and significant correlation with the spiking ability at 0.05 and 0.01 levels. The relationship for sitting height was significant only at 0.05 levels. But, the relationship for thigh and foot length was not statistically significant.

**Table – 1 SIGNIFICANCE OF RELATIONSHIPS BETWEEN BODY MEASUREMENTS AND SPIKING ABILITY**

S. No.	Variable	Coefficient of Correlation 'r'
1.	Body Weight	.7964**
2.	Height	.7862**
3.	Sitting height	.3632*
4.	Trunk length	.4982**
5.	Leg Length	.5589**
6.	Fore-leg Length	.5667**
7.	Thigh length	.0674
8.	Total arm length	.7612**
9.	Upper arm length	.6523**
10.	Fore-arm length	.6245**
11.	Foot length	.1880

\* Significant at 0.05 level

\*\* Significant at 0.01 level

N = 30; r .05 (28) = 0.361; r .01 (28) = 0.463

### 5. DISCUSSION

The results of the present investigation showed that the spiking performance of volleyball players is significantly and positively related to body weight, height, sitting height, trunk length, leg length, fore-leg length, total arm length, upper arm and fore-arm length. These findings indicate that more body-weight and taller height provide stability and more distance to be covered by the body in air. Since spiking performance depends upon the height to which the ball is smashed by the player. If the ball is smashed at a greater height then it becomes more effective. Body weight provides stability to the spiker by maintaining the balance of the body at the time of turning and hitting the ball in the air. Leg length, thigh length, fore-leg length, total arm length, upper arm and fore-arm length provide muscular force and efficient leverage at the time of hitting the ball. Hence, body weight represents generation of greater force and stability, height and its body proportions provide higher reach in the air by explosive jump, smooth hit and release the ball at required length which positively contributes to spiking performance.

The findings of the present investigation are in complete agreement with the results of the earlier studies reported by [14], [15], [16], [17].

### 6. CONCLUSION

It is concluded from the above findings that selected body measurements have positive and statistically significant relationship with spiking ability except Thigh and length.

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