

# ROLE OF BMI AND WAIST HIP RATIO ON FUNCTIONAL PERFORMANCE OF ELITE INDIAN JUNIOR TENNIS PLAYERS



## Medical Science

**KEYWORDS :** body composition, performance, jump test

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### ABSTRACT

*Objective of the study was to find out the correlation of BMI and Waist Hip ration on functional performance of elite Indian junior tennis players. 100 elite junior tennis players from different tennis academies participated in the study Pearson's correlation test was used to correlate the data and functional performance test results. The study result showed there was no correlation of BMI and Waist Hip ratio with functional performance*

### Introduction

Tennis is the most popular racket sports in the world and is characterized by explosive activities interspersed with short interval of intermittence activity over a long period involving a great variety of abilities and movements<sup>1</sup>. It demands a complete physical conditioning program including exercises to develop flexibility, agility, cardio respiratory capacity, speed, strength, power and muscular endurance.<sup>2,3</sup>

The interest in anthropometric characteristic and body composition of the players of different sports has increased over last decades. It has been well described that there are specific physical characteristics in many sports such as anthropometric profile that indicate whether the player would be suitable to compete the highest level in specific sports.<sup>4,5,6</sup> Athletic performance is, to a large degree, dependent on the athlete's ability to sustain power (both anaerobic ally and aerobically) and to overcome resistance, or drag. Both of these factors are inter-related with the athlete's body composition. Coupled with the common perception of many athletes who compete in sports where appearance is a concern for the athlete and the common perception of these athletes (swimming, diving, gymnastics, and figure skating), attainment of an ideal body composition often becomes a central theme of training. Besides the aesthetic and performance reasons for wanting to achieve an optimal body composition, there may also be safety reasons.

During past two decades great changes have taken place in tennis with respect to technique and tactic, even more with respect to physical performance of the players. Most of the scientific literature has focus on physiological and biomechanical characteristic of the players. At present there is no data available regarding body composition and anthropometry of junior players of India and regarding their performance. There for the aim of this study was to find out how anthropometry & body composition of elite Indian junior players influence their functional performance

### Methods

Subjects were recruited on the basis of voluntary participation through informed consent Subjects were recruited from different tennis academies all over Delhi and National Capital Region.

### Procedure

The subjects from different tennis academies were being informed of the study. Subjects and their parents were informed about the nature, purpose, importance and possible risk of the study. Written parental or guardian consent were obtained before the players were permitted to participate. The research committee of the Singania University approved all the procedures. The subjects who match the criteria will be selected for the study. Anthropometric and body composition measurement will be taken for the entire subject.

### Instruction to the subject

Subjects were refrained from strenuous exercise at least 48 hours prior to the testing and procedure and consume their normal pre training diet prior to the testing session. Subjects

were asked to report any discomfort during the session. The subjects were asked for their full co operation and to do the procedures to their best of the ability.

### Protocol

The entire protocol consist of 2 phases

- Pre-test measurement
- Protocol or intervention

Pre test measurement included measurement of anthropometric data which consist of BMI and Waist- hip ratio. The following functional performance test were measured for each athletes after anthropometry.

- Sergeant chalk jump test
- 40 yard sprint test
- T test

One minute of rest period was allowed between all functional performance tests<sup>7</sup>. Three trials of functional performance test were performed with 30 seconds rest period between each trial<sup>7</sup>. The best score from each functional performance test were taken from each test and recorded.

### Results

A total number of 100 elite Indian junior tennis players participated in the study. Mean age, height and weight of the athletes were  $15.34 \pm 2.16$ ,  $170.54 \pm 5.43$ , and  $65.36 \pm 3.41$  respectively. The anthropometric data (BMI and waist to hip ratio of each athletes has measured and has been correlated with all the three functional performance tests.

The result of the study shows as follows

### BMI and athletic performance

The BMI of each athlete was calculated by measuring Height and Weight of the subjects.  $BMI = \text{weight in Kg} / \text{Height}^2$  in meters The mean BMI of the subjects were  $22.45 \pm 2.26$  BMI values were correlated with the three functional performance tests The result shows that the was no correlation exist between BMI and all the three functional performance test

Tests	P value	R value
Sergeant chalk jump test	.931	-.009
40 yard sprint test	.710	.038
T test	.978	-.003

Table 1: Correlation of BMI and functional performance test

### Waist - Hip ratio and performance

The mean Waist - Hip ratio of 100 athletes was .88

The result shows that the was no correlation exist between Waist – Hip ratio and all the three functional performance test

Tests	P value	R value
Sergeant chalk jump test	.932	.009
40 yard sprint test	.868	-.017
T test	.859	.018

Table 2 Correlation of Waist – Hip ratio and functional performance tests

**Discussion**

The result of the study showed that there was no correlation exist between BMI &Waist Hip ratio with functional performance

**BMI and athletic performance:**

The effect of body mass and BMI on performance have been investigated in some previous studies especially among the runners, but none of them investigated regarding tennis players. The finding of the study is consistent with the previous study of Rehmani et al (2004)8which investigated the supremacy of African sprinters. Another study conducted by B Knechtle at al (2011)9 there was no association detected between skin fold thickness and race performance, neither the front thigh or medial calf skin fold thickness was associated with performance. But at the same time the association of BMI with performance in Kenyan runners is known. Black runners tend to be smaller and lighter than white runners10, 11, 12. When Senegalese and Italian runners were compared, the African runners had a longer and lighter legs, it is thought that their lower BMI and smaller body size are important in the better performance of the African runners. A relationship between BMI and race performance has been found with Caucasian athletes. Marathon race time was positively correlated with BMI. One reason for different finding may be the differences in the fitness level and the differences in the training level of individual players. Absolute value of BMI seems to be of some importance in some of the studies like B Knechtle(2006)13 which states that a higher and lower BMI negatively influence the performance.

BMI generally considered to be one of the best ways to determine if individual is at healthy weight. There are evidences suggest that BMI can provide acceptable proxy measures of body fatness in young people14, 15. But it is having some limitations also. As it is not a direct measurement of body fatness very muscular individuals may often fall into the overweight category when they are not over fat. Additionally BMI may place individuals who have lost the muscles into a healthy weight category

**Waist – Hip Ratio:**

The result of the study showed that Waist – Hip Ratio does not have any influence on performance. Waist – Hip Ratio can be considered as a health indicator than a performance indicator

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