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## Relative importance of anthropometric biomotor and skill performance to playing ability of college badminton players

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### Abstract

Badminton is an extremely demanding sport. At an elite level, players are often required to perform at their limits of speed, agility, flexibility, endurance and strength. On top of all of this, players must maintain a high state of concentration in order to meet the tactical/mental demands of dealing with their opponents. The purpose of the present study was to analyze the importance of selected anthropometric measurements, biomotor abilities and skill variables to playing ability of college level badminton players. 40 women badminton players were selected randomly from various departments affiliated to Annamalai University, Tamil Nadu, India. Players who participated in the Annamalai University inter collegiate women badminton tournament during the academic year 2014-2015 were selected as subjects. The age of the subjects ranged from 18 to 25 years. The following anthropometric measurements, biomotor abilities and skill variables were selected for this study. Anthropometric measurements such as weight, height, leg length, arm length, arm circumference, thigh circumference, calf circumference and bio-motor variables such as muscular endurance, shoulder strength, grip strength, speed, explosive power, flexibility, agility and skill performance variables serving, overhead clear shot and playing ability. The predictor variables namely flexibility, speed, arm length, serving and overhead clear shot can be used to predict the badminton playing ability of college men badminton players. The predictor variable selected in the multiple regression equation has high significant positive relationship with the criterion variable i.e., the playing ability. The height and weight of the badminton players are having significant relationship with playing ability of badminton players.

**Keywords:** Anthropometric, Bio motor Abilities and Skill performance Variables

### 1. Introduction

Badminton is an extremely demanding sport. At an elite level, players are often required to perform at their limits of speed, agility, flexibility, endurance and strength. On top of all of this, players must maintain a high state of concentration in order to meet the tactical/mental demands of dealing with their opponents. The varied potential stresses of competitive play are considerable. It is therefore essential that everyone involved with the modern game ought to be familiar with the fitness (physiological) requirements of the game and how 'badminton fitness' can be enhanced.

#### 1.1 Statement of the problem

The purpose of the present study was to analyze the importance of selected anthropometric measurements, biomotor abilities and skill variables to playing ability of college level badminton players.

#### 2. Objectives of the study

The primary research objectives are the

1. To investigate the degree of relationship between the criterion variable and determinant variables.
2. To determine the inter-relationship among determinant variables.

3. To select the minimum number of determinant variables that would provide the highest multiple correlation coefficient with the criterion variable.
4. To compute multiple regression equations based on multiple correlation co-efficient obtained between the criterion and selected independent variables

### 2.1 Delimitations

1. 40 women badminton players were selected randomly from various departments affiliated to Annamalai University, Tamilnadu, India.
2. Players who participated in the Annamalai University inter collegiate women's badminton tournament during the academic year 2014-2015 were selected as subjects.
3. The age of the subjects ranged from 18 to 25 years.
4. The following anthropometric measurements, biomotor abilities and skill variables were selected for this study.

### 2.2 Selection of Variables

#### Anthropometric measurements

- Weight
- Height
- Leg length
- Arm length
- Arm circumference
- Thigh circumference
- Calf circumference

### 2.3 Bio-motor variables

- Muscular endurance
- Shoulder strength
- Grip strength
- Speed
- Explosive power
- Flexibility
- Agility

### 2.4 Skill performance variables

- Serving
- Overhead clear shot
- Playing ability

## 3. Hypotheses

The following research hypotheses were framed for this study.

1. There would be a significant relationship between badminton playing ability and selected anthropometric variables.
2. There would be a significant relationship between badminton playing ability and selected bio-motor variables.
3. There would be a significant relationship between badminton playing ability and selected performance variables.
4. There would be a significant relationship between the badminton playing ability and combined effect selected anthropometric, bio-motor and skill performance variables.
5. Badminton playing ability would be predicted from the selected anthropometric, bio-motor and performance variables among the college level badminton players.

### 3.1 Significance of the study

1. The results of the study may provide the standards of the college level badminton players in various predictor variables of specific skills in badminton, bio-motor and

anthropometric variables.

2. The prediction and conclusions of this study will pave a way to create a new model that can be applied to the men in selecting badminton players.
3. The findings of the study might be used as a screening tool and technique in analyzing and classifying the players.

## 4. Results the data

Pearson product moment correlation showed that there was significant relationship between playing ability and height, weight, speed, flexibility, serving and overhead clear shot among inter-collegiate badminton players.

It was found that the multiple correlation coefficient for predictors such as flexibility, speed, arm length, serving and overhead clear shot is 0.58 which produce highest multiple correlation with badminton playing ability. R square values showed that the percentage of contribution of predictors to the playing ability (dependent variable) in the following order.

1. About 10% of the variation in the playing ability was explained by the regression model with one predictor flexibility.
2. About 19% of the variation in the playing ability was explained by the regression model with two predictors, flexibility and speed. An additional 9% of the variance in the playing ability is contributed by speed.
3. About 23% of the variation in the playing ability was explained by the regression model with three predictors, flexibility, speed and arm length. An additional 4% of the variance in the playing ability is contributed by arm length.
4. About 27% of the variation in the playing ability was explained by the regression model with four predictors, flexibility, speed, arm length and serving. An additional 4% of the variance in the playing ability is contributed by serving.
5. About 33% of the variation in the playing ability was explained by the regression model with four predictors, flexibility, speed, arm length, serving and overhead clear shot. An additional 6% of the variance in the playing ability is contributed by overhead clear shot.

The following regression equations were derived for college badminton players with dependent variables

The regression equation in obtained scores are framed by the Playing ability = (0.35) flexibility (-0.405) speed + (-0.17) arm length + 0.16 serving + 0.053 overhead clear shot + 27.23.

The regression equation for the prediction of badminton playing ability includes flexibility, speed, arm length, serving and overhead clear shot. As the multiple correlation on playing ability with the combined effect of these independent variables is highly significant, it is apparent that the obtained regression equation has a high predictive validity. Thus, this equation may be successfully utilized in selecting intercollegiate/interuniversity badminton players.

## 5. Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The predictor variables namely flexibility, speed, arm length, serving and overhead clear shot can be used to predict the badminton playing ability of college men badminton players.
2. The predictor variable selected in the multiple regression equation has high significant positive relationship with the criterion variable i.e., the playing ability.

3. The height and weight of the badminton players are having significant relationship with playing ability of badminton players.
4. The speed and flexibility of the badminton players are having significant relationship with playing ability of badminton players.
5. The skill performance variables serving and overhead clear shot are having significant relationship with playing ability of badminton players.
6. It was also found significant relationship between badminton playing ability and combined effect of selected anthropometric measurements, bio-motor abilities and skill performance variables.

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