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PHYSICAL FITNESS CHARACTERISTICS OF UNIVERSITY LEVEL BADMINTON AND VOLLEYBALL PLAYERS

AUTHOR

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ABSTRACT

The purpose of the study was to compare the physical fitness characteristics between university level male badminton and volleyball players. The present study was conducted on a sample of fifty (N=50), which includes twenty five each, male badminton (N₁=25, mean ± SD: age 20.50 ± 1.95 years, height 176.42 ± 5.11 m, weight 67.87 ± 6.03 kg, BMI 21.70 ± 1.62) and male volleyball (N₂=25, mean ± SD: age 20.42 ± 0.87 years, height 177.97 ± 6.11 m, weight 67.53 ± 6.89 kg, BMI 21.32 ± 2.07) players who participated in inter-college competitions of Guru Nanak Dev University, Amritsar, India. All the participants were informed about the aim and methodology of the study and they volunteered to participate in this study. All the participants were assessed for height, weight and selected physical fitness characteristics. The height of the subjects was measured with anthropometric rod to the nearest 0.5 cm. The weight of subjects was measured by using portable weighing machine to the nearest 0.5 kg. The vertical jump test was used to measure explosive power of the legs whereas speed was determined by 50 meters dash. Illinois agility test was used to measure agility and ball transfer test was used to determine the eye-hand co-ordination. The independent samples t-test was applied to assess the differences between badminton and volleyball players. The results of present study indicated that volleyball players had significantly greater power (p<0.05) as compared to badminton players but badminton players had significantly better speed (p<0.05), agility (p<0.05) and coordination (p<0.05) than volleyball players.

Keywords: Physical fitness, badminton, volleyball, power, speed, agility, coordination.

INTRODUCTION

Physical fitness considered as one of the prominent component of an athlete to excel in sports arena. Physical fitness, in a very broad sense, determined by the individual’s capacity for optional work and motor and sport performance (Astrand & Rodahl, 1986). Physical fitness characteristics of the players are more important as these have marked effects on the skill of players and the tactics of the teams because ball games require repeated maximum exertion such as dashing and jumping (Tsunawake, 2003). Badminton and volleyball are among the world’s popular team sports. Successful participation in these sports requires a high level of technical and tactical skills as well as suitable physical fitness characteristics. Badminton and volleyball
players require well-developed power, speed, agility and coordination. Such physical fitness characteristics are important for both badminton and volleyball players to achieve higher levels of performance. Players are required to have good physical fitness that will enable successful performance at the competitive level. The physical fitness of a player however can be a decisive determinant of success during competition (Smekal et al., 2001). The scientists collected the data of player’s physical fitness characteristics, and based on the data, they provided the profiles of the top-ranked athletes in specific sports events (Yang & Lee, 1988; Fleck, 1983; Puhl et al., 1982; Ko & Kim, 2005). Thus, the purpose of this study was to compare the physical fitness characteristics between badminton and volleyball players. The information derived from this study will serve coaches, physical educationists and sports scientists in their selection of young players and provide guidelines for training programs for badminton and volleyball.

**MATERIALS AND METHODS**

**Subjects:**
A sample of fifty (N=50), which includes twenty five each, male Badminton (N₁=25, mean ± SD: age 20.50 ± 1.95 years, height 176.42 ± 5.11 m, weight 67.87 ± 6.03 kg, BMI 21.70 ± 1.62) and male volleyball (N₂=25, mean ± SD: age 20.42 ± 0.87 years, height 177.97 ± 6.11 m, weight 67.53 ± 6.89 kg, BMI 21.32 ± 2.07) players who participated in inter-college competitions of Guru Nanak Dev University, Amritsar, India, was selected. The purposive sampling method was used to select the subjects for the present study.

**METHODOLOGY**

**Height and Weight:**
Height measurements were taken by using the standard anthropometric rod (HG-72, Nexgen ergonomics, Canada) to the nearest 0.5 cm. Full attention was given to make sure that players’ body was fully upright and their mandible was parallel to the ground. Taken values recorded in ‘cm’. The subject’s weight was measured with portable weighing machine to the nearest 0.5 kg. During measurements players were on bare feet and wearing underwear only. Measurements recorded in ‘kg’.

**Body Mass Index (BMI):**
BMI was calculated by the formula of; Body Mass Index = Weight/Height^2.

**Measurements of selected Physical Fitness Variables:**

The study was conducted on selected physical fitness variables i.e. Power, speed, agility and coordination. The necessary data was collected by administering various tests. The vertical jump test was used to measure explosive power of the legs whereas 50 meters dash test was used to determine speed. Illinois agility test was used to measure agility and ball transfer test was used to determine the eye-hand co-ordination.

**STATISTICAL ANALYSES**

Data was analyzed using SPSS Version 16.0 (Statistical Package for the Social Sciences, version 16.0, SPSS Inc, Chicago, IL, USA). Mean values (±SD) of Demographic characteristics of male badminton and volleyball players are presented. Independent samples t-test was used to test if population means estimated by two independent samples differed significantly.

### RESULTS

**Table-1. Demographic Characteristics of male Badminton and Volleyball Players.**

<table>
<thead>
<tr>
<th>Sports Group</th>
<th>Age (yrs)</th>
<th>Height (cm)</th>
<th>Weight (Kg)</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Badminton</td>
<td>20.50</td>
<td>1.95</td>
<td>176.42</td>
<td>5.11</td>
</tr>
<tr>
<td>Players</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volleyball</td>
<td>20.42</td>
<td>0.87</td>
<td>177.97</td>
<td>6.11</td>
</tr>
<tr>
<td>Players</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table-1: shown the demographic characteristics of male badminton and volleyball players. The mean age of badminton players was 20.50 years and volleyball players were 20.42 years. The mean height of badminton players was 176.42cm and volleyball players were 177.97cm. The mean weight of badminton players was 67.87 kg and volleyball players were 67.53 kg. The mean BMI value of badminton players was 21.70 and volleyball players were 21.32 respectively.

**Table-2. Physical Fitness Characteristics of Badminton and Volleyball Players.**
Table 2 presents the physical fitness characteristics of male badminton and volleyball players. The volleyball players were found to have significantly better power (p<0.05) when compared to badminton players. The badminton players had significantly better speed (p<0.05) and agility (p<0.05) than the volleyball players. Similarly co-ordination (p<0.05) was significantly greater in badminton players as compared to volleyball players.

**DISCUSSION**

In the present study physical fitness characteristics of the inter-college level badminton and volleyball players have been evaluated and compared with each other. This study clearly indicates the existence of physical fitness characteristics differences between badminton and volleyball players. The demographic characteristics of badminton and volleyball players showed that volleyball players were taller compared to the badminton players. On average, the badminton players of the present study are considerably taller and lighter when compared to Brazilian junior badminton player (Campos et al. 2009). The volleyball players in the present study have shorter height and lighter weight than their international counterparts (Gualdi & Zaccagni, 2001; Morques & Marinho, 2009; Gabbett, 2008). Because the volleyball require handling the ball above the head, having a greater height is an advantage in volleyball games (Kansal et al., 1986). Lower height of Indian volleyball players might be one of the reason for their dismal performances at the international level (Gaurav et al. 2010). The explosive power of the legs measured by vertical jump test was
significantly higher in volleyball players than badminton players. It is suggested that the lower limb muscle power, expressed by the numerous jumps performed during the games, which are important both for the attacking and blocking actions one of the main physical characteristic required in volleyball (Sheppard et al., 2007; 2008; 2009). Volleyball requires a lot of jumping. The players jump to spike and block in the game, so jumping is a very important physical performance (Zhong & Huang, 1989; Zhang, 2010). The speed measured by 50m dash, agility measured by Illinois agility test and coordination measured by ball transfer test in badminton players was better than volleyball players. Campos et al. (2009) highlight it is a sport modality which requires physical fitness characteristics are directly related to the performance in the game. Badminton athletes must have great physical capacity, especially speed, agility and aerobic strength. Concerning badminton players’ physical characteristics i.e. speed, agility, coordination contribute to the success in the game, including technique and tactics, psychological preparation and game strategy (Chint et al., 1995).

**CONCLUSION**

Significant differences were found between male badminton and volleyball players with regard to physical fitness characteristics. The badminton players had better speed, agility and co-ordination when compared to volleyball players but volleyball players had greater power than their counterpart badminton players.

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**REFERENCES**


