Comparison of motor fitness components among different racket game players of national level

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Abstract
The purpose of this study was to compare Motor fitness component levels among the National level racket sports players. Ninety (90) subjects, 30 each racket sports (Badminton, Lawn Tennis and Squash) were selected from the Lucknow city for this study. Motor fitness tests were administered to find out the various motor fitness components (Arm Strength, Leg Strength, Speed, Endurance, Flexibility and Agility) among the different racket sports. One-way Analysis of Various (ANOVA) were employed to test for significant differences (P≤0.05) among the groups while the Scheffe’s post hoc multiple comparison was applied when an F-statics indicated significant difference. Significant differences were found among different racket sports players on various Motor Fitness Components. Post hoc test revealed that Badminton players were comparatively better than Tennis and Squash games player in all the Motor Fitness Components.

Keywords: Motor fitness, racket games, national level

1. Introduction
General motor ability has been considered as one’s level of ability in wide range of activities. It has been thought of as an integrated composite of such individual traits as strength, endurance, power, speed, agility, balance, reaction time, and coordination traits underlying performance in many motor complexes. In successful motor performance, these traits function in a coordinated manner and in effective sequence to achieve an accurate and efficient movement whether it may be a single effort as in the golf drive or in a series of complexes and rapidly changing movements as in basketball (Clarke, 1976). Racquet Sports are very fitness demanding sports. There is a great deal of attributes a person needs in order to become a successful in racket sports. The main fitness components are agility, speed, muscular endurance, muscular power and cardio-respiratory endurance. Good hand eye co-ordination is a must in this sport, in order to become successful. Agility is the ability to change the position of the body and the direction of the body quickly and accurately. But still there are various differences in the way the different racket sports are played. The racket sports like Badminton, Tennis and Squash has different skills and motor abilities requirements. It is in the light of these that the researchers evaluated the motor fitness components of the racket games players with the view of determining and providing information on the differences that may exist among the three groups of players.

2. Methods and Materials
Ninety (90) male sportsperson who participated in National level competitions of Badminton, Lawn Tennis and Squash were selected as subjects for this study. Motor fitness components namely strength, speed, endurance, flexibility and agility were selected for this study. The data were collected for each motor fitness component at Lucknow Christian College Ground, Lucknow. The standard tests which were selected for each variable of motor fitness component are as follows: chin-ups for arm strength, standing broad jump for Leg strength, 50 meter dash for speed, 600 yard run/walk for endurance, scott and french test for flexibility and shuttle run (4×10 yard) for agility were administrated to the subjects.
The results of the study are presented in Table -1 and Table-2. The analysis of variance employed to investigate difference among racket sports groups on the motor fitness Components has been presented in table -1. Table-2 shows the Scheffe’s Post-Hoc comparison of group means.

**Table 1: ANOVA Summaries for Motor Fitness Components of Racket Games Players**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source of variance</th>
<th>Sum of Square</th>
<th>Mean Sum of Square</th>
<th>Obtained F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Strength</td>
<td>Between group</td>
<td>466.03</td>
<td>233.01</td>
<td>24.65*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>822.3</td>
<td>9.45</td>
<td></td>
</tr>
<tr>
<td>Leg Strength</td>
<td>Between Group</td>
<td>8652.4</td>
<td>4321.2</td>
<td>10.79*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>34835.2</td>
<td>400.40</td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>Between Group</td>
<td>8.434</td>
<td>4.21</td>
<td>19.08*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>19.276</td>
<td>0.221</td>
<td></td>
</tr>
<tr>
<td>Endurance</td>
<td>Between Group</td>
<td>6894.496</td>
<td>3447.24</td>
<td>9.25*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>32395.73</td>
<td>372.36</td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>Between Group</td>
<td>102.59</td>
<td>51.29</td>
<td>11.39*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>392.34</td>
<td>4.50</td>
<td></td>
</tr>
<tr>
<td>Agility</td>
<td>Between Group</td>
<td>4.01</td>
<td>2.005</td>
<td>9.87*</td>
</tr>
<tr>
<td></td>
<td>Within Group</td>
<td>17.77</td>
<td>0.203</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 0.05 Level, F (2, 87) =3.103

The Table 1 shows the one-way Analysis of Variance summaries for the Motor fitness components of the racket games players. The table shows the variance and f. value obtained for motor fitness components (Arm strength, Leg strength, Speed, Endurance, Flexibility and Agility). The computed F ratio for Arm length (24.65), Leg strength (10.79), Speed (19.79), Endurance (9.25), Flexibility (11.39) and Agility (9.87) were found significant (P≤0.05).

**Table 2: Post-Hoc (Scheffe’s) Comparison of Group Means for Motor Fitness Components**

<table>
<thead>
<tr>
<th></th>
<th>Arm Strength</th>
<th>Leg Strength</th>
<th>Speed</th>
<th>Endurance</th>
<th>Flexibility</th>
<th>Agility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badminton V/S Squash</td>
<td>0.34</td>
<td>14.6*</td>
<td>0.105</td>
<td>2.005</td>
<td>2.6*</td>
<td>1.59</td>
</tr>
<tr>
<td>Badminton V/S Tennis</td>
<td>4.97*</td>
<td>23.8*</td>
<td>2.005</td>
<td>8.60*</td>
<td>2.6*</td>
<td>1.59</td>
</tr>
<tr>
<td>Squash V/S Tennis</td>
<td>4.63*</td>
<td>9.2</td>
<td>0.596</td>
<td>18.54*</td>
<td>2.6*</td>
<td>0.516*</td>
</tr>
</tbody>
</table>

*Significant at 0.05 level.

The Table 2 shows the result of Post-hoc test (Scheffe’s) to assess pair wise differences of motor fitness among three groups. The significant differences were found between Badminton and Squash, between Badminton and Tennis and between Squash and Tennis Games players on various motor fitness components (P≤0.05).

3.2 Discussion of the Finding: The analysis of data using Analysis of Variance (ANOVA) test showed that variation exist among Badminton, Lawn tennis and Squash groups in all the selected motor fitness variables. Badminton players are relatively higher on all the motor fitness components followed by Lawn tennis and Squash players are relatively lower on motor fitness components among these group. This may be because in Badminton the nature of game is more strenuous than Squash and Lawn tennis players. In Badminton strength, Agility and Flexibility components are dominating factor for their performance than Lawn tennis. Therefore, significant difference exists. Badminton scored higher than Squash players. Though the difference was not significant, this may be due to their nature of game require motor fitness, and in both the groups motor fitness plays an important role for optimum performance.

4. Conclusions

Within the limitations imposed by the subject and the experimental conditions, the following conclusions were derived:

1. Badminton, Lawn Tennis and Squash groups indicated difference on arm strength, Badminton players being higher on arm strength than other two groups and the Lawn Tennis players scored lowest among them.
2. Badminton, Lawn Tennis and Squash groups indicated difference on leg strength, Badminton being higher on leg strength than Lawn Tennis and Squash groups and Squash players scored lowest scores on leg strength.
3. Result revealed that difference existed among Badminton, Lawn Tennis and Squash groups on speed variable, Badminton and Squash groups scored highest and lowest on speed variable respectively.
4. On endurance variable, difference exist among Badminton, Lawn Tennis and Squash groups, Badminton and Lawn Tennis groups scored highest and lowest endurance variable respectively.
5. Badminton, Lawn Tennis and Squash group indicated difference on flexibility, Badminton and Squash groups scored highest and lowest on flexibility variable respectively.
6. Badminton, Lawn Tennis and Squash group indicated difference on agility, Badminton and Lawn Tennis groups scored highest and lowest on agility variable respectively.

5. References

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