A Comparative Study on Cardiovascular Endurance, Explosive Strength of Legs and Agility among female Interuniversity Handball & Hockey players

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Abstract: The main purpose of the study was to compare Cardiovascular Endurance, Explosive Strength of Legs and Agility among female Interuniversity Handball & Hockey players. 50 Female players, 25 Interuniversity Handball Players and 25 Interuniversity Hockey Players, of the age group ranging from 19-24 years were selected. Queens College Test, Standing Board Jump and Shutter Run Test were used to measure Cardiovascular Endurance, Explosive Strength and Agility, respectively. To analyse the data, Mean, SD were computed and at .05 level of significance t-test was performed to determine the statistical differences, if any, among the players. There was significant difference in cardiovascular endurance $t(38)=2.65$, $p<0.05$ and Explosive Strength of Legs $t(38)=4.38$, $p<0.05$ and no significant difference in Agility $t(48)=0.90$, $p>0.05$. The Handball Players had better Cardiovascular Endurance than Hockey Players, the Hockey players had better explosive strength of legs than Handball players and Agility was same in both the groups.

Key Words: Handball, Hockey, Players, Cardiovascular, Endurance, Explosive, Strength, Agility.

Introduction:
In the present world sports and games become extremely competitive, previous records are being broken more rapidly now a day. The reason is that the continuous hard work right from the child hood, modern techniques, physical fitness, physiological and psychological components plays an important role in execution of performance. A skillful player will go a long way in the sport but without fitness part of their game they will not become a complete player.

Modern sport requires an incredible and exceptional level of fitness to survive in the competition and to cope up with the level of the competing team. It is dream of every player or team to break other player or team’s record or make one to stand on the top of the ranking list. Thus players should be engaging in a serious training/conditioning programme to the supreme competitive sport. According to Encyclopedia Britannica (1994), the training of the body improves its function and enhances its fitness, so it is understood that for all systems of the body to be fit, we need physiological fitness which should respond to hard work and effective functioning of appropriate systems. Enthusiastic and aggressive representation of athletes during game, sometimes lead to overload on the body and may create some emergency situation. A well designed conditioning programme provides opportunity for development and maintenance of physical fitness. In other words conditioning the body through regular exercises enables the player to meet emergences more effectively.

The benefits of physical fitness are numerous. The person who is physically fit has greater amount of strength, energy and stamina an improved sense of well being better protection from injury because strong well developed muscles safeguard bones, internal organs and joints and keep moving parts limber and improve cardio respiratory function Bucher and Prentice (1985). By undergoing physical fitness programme one experiences a number of changes which makes possible better performance. Physically fit individuals are more able to meet the challenges of life. Such persons can bear the stress due to better health status. They are more resistant to the effect of stress than physically less fit individuals.

According to Harre (1979) for a high level of efficiency in techniques and tactics in most sports; a high level of physical fitness is most important. Therefore, physical fitness is considered to be fundamental criterion for developing an efficient system of selection strategy and efficient performance is possible through only a careful planned conditioning & training programme and progressive practice.

Carolyn Gillespie (2015), Fitness in the game of field hockey is just as important as passing and receiving, scoring, tackling, making saves and playing well. Fitness is key to your success both in the short and long term in playing this sport, and importantly, it helps you maintain a healthy and active lifestyle, helping to minimize and prevent injuries.
Regular exercises enable the individual to meet emergencies more effectively. Physical fitness programme prepares the player for efficient performance and healthful living. Efficient performance is possible through a careful planned programme of progressive practice of physical fitness. The condition of heart lungs improves providing sufficient oxygen to the muscles during continuous exercises for a long period of time. Through repeated muscular work endurance and strength is gained. One is able to produce more power and speed which is very important for better performance. Quick start & stop and quick change in direction are fundamental for good performance in hockey and handball. Agility is the ability to change direction of body or its parts rapidly which can be developed through regular Co-ordinative exercises. Leg strength is the primary source of power of many sports. According to Gambetta (2007) the legs can be seen as a functional unit of closed kinetic chain without which athlete cannot have speed, strength, power or suppleness to perform.

The physical fitness is the sum total of motor abilities namely cardiovascular endurance, muscular strength, agility, power and speed. So, the performance of a player also depends on physical fitness. Keeping in view the importance of physical fitness, the purpose of the present study was to compare the selected physical fitness components among interuniversity female handball & hockey players. Who activity participate in interuniversity tournaments of their respective games. Specific physical fitness tests were selected to measure the three physical fitness components i.e. cardiovascular endurance, explosive strength of leg and Agility.

Methodology:
The present study was conducted on 50 female players (25 female handball players and 25 female hockey players) of age group 18-24 years. The handball & hockey female players who represented their respective universities for west zone inter-university tournaments, necessary permission was taken from players & the respective coaches of their teams.

Test Procedure:
For measurement of selected physical components of female handball & hockey players, standard physical fitness tests were used. First Queens’ College Step Test was used to measure cardiovascular endurance. Second Standing Broad Jump was used to measure leg strength and third 10 yards-Shutter Run was used to measure Agility.

Statistical Analysis:
Mean and standard deviation was computed. Comparison was made on the basis of respective games, for this purpose t-test was applied.

Results:
The mean S.D. and t-test was calculated to find out the significant differences. The mean of women handball players in cardiovascular endurance was 46.59, S.D. 3.34 and mean of women hockey player in cardiovascular endurance was 42.37, S.D. 3.07 and t-value was 2.65 which was significant. The mean of women handball players in explosive strength was 1.43, S.D was 0.14 and mean of women hockey players was 1.60, S.D was 0.13 and t-value was 4.38 which was significant. The mean of women handball players in Agility was 11.53, S.D 1.19 and mean of women hockey players was 11.57, S.D 0.93 and t-value was 0.90 which was insignificant.

Table 1
Shows Mean, standard deviation and t-test.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Variables</th>
<th>Handball Players N = 25</th>
<th>Hockey Players N = 25</th>
<th>T-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cardiovascular Endurance</td>
<td>Mean 46.59 SD 3.34</td>
<td>Mean 42.37 SD 3.07</td>
<td>2.65*</td>
</tr>
<tr>
<td>2</td>
<td>Explosive Strength of Legs</td>
<td>Mean 1.43 SD 0.14</td>
<td>Mean 1.60 SD 0.13</td>
<td>4.38*</td>
</tr>
</tbody>
</table>
Discussion:
The study analyzed the comparison of selected physical components among interuniversity female players of handball & hockey in the following three physical fitness tests.

- In Queens College test the result showed that there was significance difference in cardiovascular endurance among female handball & hockey players.
- In standing brad jump test there was significant difference in explosive strength of legs among female handball & hockey players.
- In agility there was no significance among female handball & hockey players.

Conclusion:
The Handball Players had better Cardiovascular Endurance than Hockey Players, the Hockey players had better explosive strength of legs than Handball players and Agility was same in both the groups.

As a result, knowing the physical fitness of female handball and hockey players can enable couches trainers strength and condition specialists to establish physical expectations, design, and science based training programme that will improve performance and address any weakness in physical fitness identified through testing. This information derived from this study will also help the coaches in their selection of players.

Reference:


V Gaurav et al. Comparison of physical fitness variables between individual game & team game. Indian journal if science &technology 2011; Vol. 4, No. 5.


