

Criteria of fitness: A comparative study of hockey and football girl players

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Abstract

Teams are prepared not only to play but to win the games. And for winning the game, it is not only the proficiency in the skills of the game, which bring victory, but more important is the spirit and physical fitness of the player with which he plays and performs his best in the competition. Physical fitness has always been a concern of man from pre-historic times. Indeed, it was survival for the fittest. Throughout human evolution man has been a nomad, a hunter and a farmer. His body had a high degree of adaptability for walking, running, jumping and throwing. Only recently complete changes have taken place due to motorization, automation and industrialization and demand to gross motor activities have been greatly reduced. These changes have caused a number of so called hypothetic diseases and have lowered the degree of physical fitness (Percival *et al* 1982).

Keywords: fitness, players, sports

1. Introduction

Physical fitness is the most important factor for the progress in the field of sports and general life. However, it is very difficult to define exactly the concept of physical fitness. Many have tried to define this complicated and complex term in their own way. Physical fitness has been defined as total functional capacity of an individual to perform a given task.

It is the ability to perform a task without fatigue or exhaustion, bearing always energy to meet behavior demand made on the individual during stress and strain (Thomas, 1984).

The traditional theory that top class players are born and not can be made has been out rightly rejected by modern scientific thinkers who have demonstrated that a player though he may has an average career in the beginning of his sports career, can be groomed and made into first class player of any game.

Till recently, it was being felt, especially in India, that performance in games and sports is based on skills and fundamentals and not on physical ability. It is now being realized by trainers, all over the world, that games and sports of any kind require a lot of strength, endurance, speed, flexibility, agility and mental fitness etc.

Each basic skill of Hockey and Football can be improved through good physical fitness and training. In both the games proper blocking and tackling are the basic skills and these should be gasped by every player. These skills need burst of power (strength and speed). Running requires a quick burst of power and usually ends in physical contract requiring the runner to drive into an opponent, because the runner must run with power against stiff resistance and these skills probably be improved in these games. The other two skills passing and hitting (kicking in Football) also require a special technique. Even though all these skills are mastered, however, additional physical fitness and capacity are required to have great advantage.

The major objective of the study is to compare the Senior Secondary School's Girl Players of Hockey and Football in their Physical Fitness.

1.1 Limitations

The study is limited to girl players of Hockey and Football of Senior Secondary Schools of Ambala and Shahabad. The study is restricted to 100 girl players (50 from each game), who belong to 13-16 years of age group. The study also limited to 7 physical fitness components which were measurable through the Haro Singer Test (1984) [5].

All efforts have made by the investigator to motivate the students to put up their optimal performance in various test items. The general mood of the subjects while testing could have affected the performance.

1.2 Hypothesis

There will be significant difference between the mean scores of girl players of Hockey and Football on Physical Fitness Components."

1.3 Sampling

The study has been done on the Hockey and Football girl players of Senior Secondary Schools of Shahabad and Ambala Cantt. They are regular players of coaching center established by SAI. The details of the sampling are depicted in Table-I.

Table 1

S. No.	Name of the School	Players		
		Hockey	Football	Total
1.	Rukmani Devi Arya Girls Sr. Sec. School, Shahabad	15	15	30
2.	S.G.H. Khalsa Sen. Sec. School for Girls Shahabad.	10	10	20
3.	S.D. Public School for Girls, Ambala Cantt.	10	10	20
4.	Bal Bharti Public School for Girls, Ambala Cantt.	15	15	30
	Total	50	50	100

1.4 Tool Used

To measure the physical fitness of both games’ players the following tools have been used. These tests items have been drawn from Haro-Singer Fitness Test (1984) [5]

- **Item – I:** Figure 8 Run Test to measure flexibility and agility.
- **Item – II:** Sit Ups Test to measure muscular strength.
- **Item – III:** Jumping Test to measure power & strength of legs.
- **Item – IV:** Push Ups Test To measure maximum power & strength of shoulders.
- **Item – V:** 100 mts. Dash To measure speed of movement.
- **Item – VI:** 800 mts. Run/Walk to measure endurance.
- **Item – VII:** Ball Throw Test To measure explosive strength and co-ordinative ability.

1.5 Data Collection

For the collection of the data, the investigator engaged herself in the work. The assistance of qualified persons, physical education teachers and coaches working at Shahabad and Ambala were taken in the measurement of all the test items and help of subjects (players) were also taken in fixing the equipments etc. The following are general guidelines observed to conduct the physical fitness test.

The test items began at the same time in more than two stations. At each station, the performer performed test in a total time of half a minute only. Between different stations there was 2 minute pause kept which was used for active rest. The point scored at the different test items were connected by a test administer marked in test card added as a sum score.

The test station also made up in such a way that two to four subjects could be tested at the same time at each test station. Tests were administered on the subject after giving them sufficient explanation to each event. Demonstrations and instructions were given before the commencement of tests. The investigator personally administered the test items to all the subjects and recorded the scores.

1.6 Control Factors

All tests were conducted in morning and evening only. No test was conducted on a rainy or windy day. All seven items were completed in two days duration. All the measurements were taken with the standard equipments.

All prescribed help and suggestions in modifying and conducting the tests were taken from the coaches & physical education teachers.

1.7 Statistical Analysis:

The data was analyzed by calculating the means, standard deviations and to compare both types of players, t-ratio was used.

2. Results & Discussions

Table 2: Significance of Difference between Mean Scores of Hockey and Football Girl Players on Figure 8 Run Test to Compare Flexibility and Agility

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
3.590	0.319	3.330	2.60	2.5004*

* Significant at .05 level of confidence

The Table – 2 represents the significance of mean difference between Hockey and Football players on physical fitness component test of flexibility and agility i.e. Figure 8 Run Test. Mean value of Hockey players was recorded 3.590 with SD 0.319 and mean value of Football players was 3.330 with SD 2.60 t-ratio was calculated as 2.5004 that was found significant at .05 level of confidence.

Table 3: Significance of Difference between Mean Scores of Hockey and Football Girl Players on Situps to Compare Muscular Strength

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
14.502	0.598	14.05	0.536	3.365**

** Significant at .01 level of confidence

Table – 3 shows the significance of mean difference between Hockey and Football players on physical fitness component test of muscular strength i.e. situps. Mean value of Hockey players was 14.502 with SD 0.598 and mean value of Football players was 14.05 with SD 0.536 t-ratio was calculated as 3.365 and it was found significant at .01 level of confidence.

Table 4: Significance of Difference between Mean Scores of Hockey and Football Girl Players on Jumping Event to Compare Power and Strength of Legs

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
6.487	0.295	6.225	0.218	5.4216**

** Significant at .01 level of confidence

1. Result

Table – 4 depicts the significance of mean difference between Hockey and Football players on physical fitness component test of power and strength of legs i.e. jumping event. Mean value of Hockey players was calculated as 6.487 with SD 0.295 and of Football players was calculated as 6.225 with SD 0.218. t-ratio was calculated 5.4216 which is again significant at .01 level of confidence.

Table 5: Significance of Difference between Mean Scores of Hockey and Football Girl Players on Push Ups Test to Compare Power and Strength of Shoulders

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
13.862	0.58	14.065	0.594	2.78*

* Significant at .05 level of confidence

2. Result

Table – 5 explains the significance of mean difference between Hockey and Football players on physical fitness component test of power and strength of shoulders i.e. push-ups. Mean value of Hockey players was calculated 13.862 with SD 0.58 and mean value of Football players was calculated as 14.065 with SD 0.594. t-ratio was calculated 2.78, which is significant at .05 level of confidence.

Table 6: Significance of Difference between Mean Scores of Hockey and Football Girl Players on 100 mts. Dash to Compare Speed

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
14.326	0.615	14.065	0.594	2.78*

* Significant at .05 level of confidence

3. Result

Table – 6 shows the significance of mean difference between Hockey and Football players on physical fitness component test of speed i.e. 100 mts. dash. Mean value of Hockey players was calculated 14.326 with SD 0.615 and mean value of Football was calculated 14.065 with SD 0.594. t-ratio was calculated 2.78, which is significant at .05 level of confidence.

Table 7: Significance of Difference between Mean Scores of Hockey and Football Girl Players on 800 mts. Run/Walk to Compare Endurance

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
6.590	0.319	6.330	0.260	2.5004*

* Significant at .05 level of confidence

4. Result

Table – 7 explains the significance of mean difference between Hockey and Football players on physical fitness component test of endurance i.e. 800 mts. Run/Walk. Mean value of Hockey players was calculated 6.590 with SD 0.319 and mean value of Football players was calculated 6.330 with SD 0.260. t-ratio was calculated as 2.5004, which is significant at .05 level of confidence.

Table 8: Significance of Difference between Hockey and Football Girl Players on Ball Throw to Compare Explosive strength and Coordinative ability

Hockey		Football		t-ratio
Mean	SD	Mean	SD	
47.00	6.538	51.125	6.157	2.88*

* Significant at .05 level of confidence

5. Result

Table-8 represents the significance of mean difference between Hockey and Football players on physical fitness component test of explosive strength and co-ordinative ability i.e. ball throw. Mean value of Hockey players was calculated 47.00 with SD 6.538 and mean value of Football players was calculated as 51.125 with SD 6.157. t-ratio was calculated as 2.88, which is significant at .05 level of confidence.

3. Discussion of the Results

1) Flexibility and Agility through Figure 8 Run Test The flexibility and agility is the movement, which is known as prime quality in both the games. This is required in almost all the fundamental skills of Hockey and Football as it makes the combination of strength, endurance and explosive power to every type of hockey and football skills such as hitting in hockey, kicking in football, pushing, scooping in hockey and throwing, heading in football. It can be defined as the foundation base for both the games.

From the results shown in Table – 2, it is clear that t-ratio between the mean scores of Hockey and Football players is

2.5004, which is more than the table value at .05 level of confidence. This means there is significant difference between the mean scores of girl players of Hockey and Football. The Hockey players have more flexibility and agility then Football players as Football players clocked mean score is less than Hockey players indicating better performance of Hockey girl players so the hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

2) Muscular Strength through Situps

This movement was taken to measure muscular strength. Muscular strength is recognized as one of the important factors in the performance of skills in both the games. It is a muscular force exerted against movable and immovable objects and it differs from individual to individual. A certain degree of strength is necessary in performing the skills of Hockey and Football. High degree of strength is regarded as luxury.

From the results shown in Table – 3, it is clear that the t-ratio between the mean scores of Hockey and Football players is 3.365, which is more than the table value at .01 level of confidence. This means there is significant difference between mean scores of girl players of Hockey and Football. The hockey players are better than Football players as for as strength is concerned as their mean score of situps is more than Football players so the hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

3) Power and Strength of Legs through Jumping Event

This event was taken as a measurement of power along with strength of legs. Power may be defined as the role of doing work and here it refers to the ability to release maximum force in the shortest possible time against a resistance. This is also known as work power which using as efforts on the specific muscle group. This is an important factor of physical fitness parameter like strength and speed of movement. In Hockey and Football it is used in every skill of the game as a foundation base as the player has to move his body according to the need of the skill in both the games such as throwing, hitting, or kicking the ball with accuracy to get the ball moved in the maximum. They have to make passive stretches and reflexes of the body in the line of the ball.

From the results shown in Table – 4, it is clear that the t-ratio between the mean scores of Hockey and Football players is 5.4216, which is more than the table value at .01 level of confidence. This means there is significant difference between the mean scores of girl players of Hockey and Football as for as power and strength of legs is concerned. Hockey players mean score of jumping event is more than Football players. So Hockey players have more power and strength of legs than Football players. So, the hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

4) Strength and Power of Shoulders through Push Ups

In both the games the strength and power of the shoulders is invariably recognized as one of the most important factors in the performance of physical skills and fundamentals of the both the games.

A certain degree of shoulder strength and power is necessary in performing almost all the skills of Football and Hockey.

Shoulders have to play an active role in these games spending in tackling, dodging, hitting, kicking the ball and all the organs have to co-ordinate this force in the overall performance.

From the results shown in Table – 5, it is clear that the t-ratio between the mean scores of Hockey and Football players is 2.78, which is more than the table value at .05 level of confidence. This means there is significant difference between the mean scores of girl players of Hockey and Football. Football players have more strength and power of shoulders as their mean score of pushups is more than Hockey players. So the hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

5) Speed of Movement through 100 mts. Dash

Speed of movement is prime quality in both the games. The players have to run in both the games from one corner to another in the ground. It is defined as the rate at which a player can propel her body or part of her body and can refer to this reaction of the body or the part of her body under the required circumstances and through space in moving the ball, hitting and kicking the ball and using most of the skills of both games. From the results shown in Table -6, it is clear that the t-ratio between the mean scores of Hockey and Football players is 2.78, which is more than the table value at .05 level of confidence. This means there is significant differences between the mean scores of girl players of Hockey and Football. Football players have more speed of movements as their mean score of 100 mts. Dash is better than Hockey players. The low scoring of finishing 100 mts. Dash in seconds means better achievement. So the hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

6) Endurance through 800 mts. Run/Walk

The endurance is considered as the longer stay in the ground, working for longer duration as it is the energy of the body to be spent for a longer period. Energy of the body of the players is always consumed in both the games. The body is capable of adopting specifically imposed demands in order to meet the stress for longer period.

From the results shown in Table – 7, it is clear that the t-ratio between the mean scores of Hockey and Football players is 2.5004, which is more than the table value at .05 level of confidence. This means there is significant difference between mean scores of girl players of Hockey and Football. Football players have more endurance as their mean score of 800 mts. Run/Walk is better than Hockey players. The low scoring of completing 800 mts. Run/Walk in minutes means better achievement. So, the Hypothesis “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

7) Explosive Strength and Coordinative Ability through Ball Throw

Explosive strength and coordinative ability are the basic requirements for every skill in both the games as in Hockey and Football we require power from wrist, muscles and movement of legs and draw the maximum power from the shoulder in hitting, kicking and speed of movement from the legs. We require best coordinating power of the whole body in stopping the ball, heading the ball in balanced throw in and

scoop etc. in Hockey and Football. In other words our body is engaged in performing a particular role in different skills of the game.

From the results shown in Table – 8, it is clear that the t-ratio between the mean scores of Hockey and Football players is 2.88, which is more than the table value at .05 level of confidence. This means there is significant difference between mean scores of girl players of Hockey and Football player. Football player have more explosive strength and coordinative ability as their mean score of Ball Throw is more than Hockey Players. So, the hypothesis, “There will be significant difference between mean scores of girl players of Hockey and Football on Physical Fitness Components.” is accepted.

4. Findings

1. Flexibility and Agility: There has been significant difference between Hockey and Football girl players of Senior Secondary Schools on flexibility and agility.

It was found that Hockey girl players have more flexibility and agility than Football girl players.

2. Muscular Strength:- There has been significant difference between Hockey and Football girl players of Senior Secondary School on Muscular strength.

It was found Hockey girl players have more muscular strength than Football girl players.

3. Power and Strength of Legs:- There has been significant difference between Hockey and Football girl players of Senior Secondary Schools on power and strength of legs.

It was found that Hockey girl player have more power and strength of legs than Football girl players.

4. Strength and Power of Shoulders:- There has been significant difference between Hockey and Football girls players of Senior Secondary Schools on strength and power of shoulders.

It was found that Football girl players have more strength and power of shoulder than Hockey girl players.

5. Speed of Movement:- There has been significant difference between Hockey and Football girl players of Senior Secondary Schools on speed of movement.

It was found that Football girl players have more speed of movement than Hockey girl players.

6. Endurance: There has been significant difference between Hockey and Football girl players of Senior Secondary School on endurance.

It was found that Football girl players have more endurance than Hockey girl players.

7. Explosive Strength and Co-ordinative Ability: There has been significance difference between Hockey and Football girl players of Senior Secondary School on explosive strength and coordinative ability.

It was found that Football girl players have more explosive strength and coordinative ability than Hockey girl players.

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