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Relationship of Selected Motor Fitness Variables to Playing Ability in Hockey

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Abstract – Games and sport are a popular pastime for the young and old, for boys and girls and men and women. Sports are as old as the human society and it has achieved universal status in the modern society. Hockey is a game of masterful and skill and deception and concentration. Hockey is a dynamic fluid, team game played both sexes. The purpose of this study was to find out the relationship of selected motor fitness variables to playing ability in hockey.it is hypothesized that there would be significant relationship with selected motor fitness variables such as muscular power, agility, muscular strength, muscular endurance, cardiovascular endurance, flexibility and speed to playing ability in hockey. 30 female hockey players between 14-16 years of age were selected as subject for the purpose of this study. These players who have at least represented Uttar Pradesh and are still plating competitive hockey. The coach has graded each individual player out of 10 points, which measured subject playing ability. Administrating various tests for the chosen variables collected the necessary data. The motor fitness variables and playing ability variables were conducted at madan mohan malviya stadium, prayagraj.

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The Relationship of selected motor fitness variables and playing ability was established by computing persons product moment correlation method. Product moment correlation was compared for muscular power, agility, muscular strength, muscular endurance, flexibility, cardiovascular endurance and speed with playing ability. The result showed significant relationship between cardio- vascular endurance flexibility, speed and hockey playing ability. There is an insignificant relationship between muscular power, muscular strength, endurance and hockey playing ability. Hence the hypothesis is partially accepted.

Among different games and sports, hockey has become one of the most popular games in the world. It is the only game that has remained entirely amateur, a status, which is jealously preserved all those who player or support. It must also be one of the oldest games, for the form, which the present one organignated is generally accepted as having been played for over two thousand years. Its popularity has doubt, always owed much to the fascination man finds in the hitting the ball with a stick. Today hockey is essentially a team game and has developed into a fast and highly skillful one. Motor fitness permits greater freedom of body movements and helps for the maintaince of working capacity for a longer time. It helps in preventing injurious and increasing coordination of movement and shortening the pace for acquiring and perfecting movements. It contributes to the form of concept and ideas and development of confidence.

Motor fitness may be defined as a readiness or preparedness for performance with special regard for big muscle activity without undue fatigue. It concerns the capacity to move the body affectivity with force over a reasonable length of time. Motor fitness, as a limited phase of physical fitness, would seem to be the aspect that most fitness tests actually measure motor fitness does not access the factors of physical fitness directly but does not reflect them to a degree. The purpose of this study was to find out the relationship of selected motor fitness variables to playing ability in hockey.it is hypothesized that there would be significant relationship with selected motor fitness variables such as muscular power, agility, muscular strength, muscular endurance, cardiovascular endurance, flexibility and speed to playing ability in hockey. 30 female hockey players between 14-16 years of age were selected as subject for the purpose of this study. These players who have at least represented Uttar Pradesh and are still plating competitive hockey.

Definition of the motor fitness

A limited phase of motor ability, emphasizing capacity for vigorous work. The aspects selected for emphasis are endurance, power, strength, agility, flexibility and balance.

Muscular power

One's ability to get his body mass moving in the shortest period of times is a measure of power.

Muscular strength

Muscular strength is defined as the force that a muscle or group of muscle can exert against a resistance is one maximum effort.

Muscular endurance

The ability of muscle to work against a moderate resistance for long periods of time is timed as muscular endurance.

Flexibility

Flexibility is usually interpreted as the range of motion at a particular joint, measured in degrees. Extensibility of the soft tissues, ligaments and especially of the muscles and the anatomical structure of the joint help to determine the degree of flexibility.

Agility

Agility may be defined as the physical ability, which enables an individual to rapidly change body positions and directions in a precise manner.

Circulatory- respiratory endurance

Circulatory respiratory endurance also called cardiovascular endurance, is characterized by moderate contractions of large muscles group for relatively long period of time, during which maximal adjustment of the circulatory- respiratory system the activity are necessary, as in distance running and swimming.

Speed-

Speed may be defined as the capacity of the individual to perform successive movements of the same pattern at a fast rate.

Playing ability-

It is the state optimum readiness of the sportsmen for achieving sports result, which is required under definite conditions. On the whole playing ability is a harmonious unity of all respects of athlete's optimum readiness physical, psychic, technical and tactical.

The procedure adopted foe the selection of subjects, selection of variables, criterion measure, collection of data and statistical technique employed for analyzing the data have been described in this study. 30 female hockey players between 14-16 years of age were selects as a subject for the purpose of this study. These players who have at least represented Uttar Pradesh and are still playing competitive hockey.

Motor fitness variables-

- Muscular power
- Agility
- Muscular strength
- Muscular endurance
- Cardiovascular endurance
- Flexibility
- Speed

PLAYING ABILITY VARIABLES

The coach has graded each individual player out of 10 points, which measured subjects playing ability.

CRITERION MEASURE

√ The muscular power was measured through standing broad jump, which was recorded in meters and centimeters taken as a criterion for leg power.

√ Semo agility run was used for the purpose of measuring agility and the time was recorded in seconds ($1/10^{th}$ of second) to complete the semo agility run course.

√ The total number of correct completed chin-ups was taken as a criterion measure for measuring muscular strength.

√ The total number of correct completed sit-ups in one minute was taken as a criterion measure for measuring muscular endurance.

√ The 600- yards run/walk test was taken as a criterion measure for measuring cardiovascular endurance and the covered distance was recorded in minute and seconds.

√ Scott and French test were used for measuring flexibility and were recorded in inches.

√ 50 yard run was selected for measuring speed component and the time was recorded in second ($1/10^{th}$ of a second) to cover the given distance.

√ Playing ability was graded by coach each individual player out; of 10 point which measured subjects playing ability.

COLLECTION OF DATA AND ADMINISTRATION OF TESTS

Administrating various tests for the chosen variables collected the necessary data. The motor fitness variables and playing ability variables were conducted at madan mohan malviya stadium, prayagraj.

Motor fitness variables-

The following are the items of motor fitness variables--

1. Standing broad jump-

Purpose-

The purpose of the test was the measure the muscular power of the subjects.

Facilities and equipment's-

Measuring tape and jumping pit

Procedure-

The subjects were asked to stand on toes on the takeoff line, which was 1 meter from the pit with feet's shoulder width apart and parallel to each other. By flexing her knees and swimming her arm back, the subject jumped out ward as far as possible.

Scoring-

The distance of all the jumps was measured to the nearest centimeters. Three trials were permitted in succession and the best was taken into account.

2. Semo agility-

Purpose-

The purpose of the semo agility run was to measure the agility of the performance in running and changing directions.

Facilities and equipment's-

Accurately measured and marked 19x12 feet rectangle, measuring tape wooden clapper and stop watch.

Procedure-

A 19x12 feet rectangle was marked on the ground with four stations. A.B.C. and D the subjects took his starting position at A width his back to the line. On the command 'ready' and 'go' (i.e. clap of the clapper) the subjects run sideward from 'A' TO 'B' then run backward from C to B and finally run sideward from B to the finishing point A.

Scoring-

The time taken by the subject from the starting point to complete the course was recorded to the nearest $1/10^{th}$ of a second as a score.

3. Chin-ups

Purpose-

The purpose of the test was to measure the muscular strength of the subjects.

Facilities and equipment's-

A metal bar approximately ½ inches in diameter.

Procedure-

The bar was adjusted to a height that permits the student to hang free from the floor. From the hanging position with reserve grip (palm facing body) and arm straight, the body was pulled upward until the chin rest over the bar and then lowered until the arm were straighter. The movement was repeated to exhaustion. The subject was not allowed to kick or jerk.

Scoring-

The number of correct completed chin-ups was the score. No fractional credit was given for incomplete or partial attempts. Only one trial was permitted.

4. Sit-up

Purpose-

The purpose of the test was the measure the muscular endurance of the subjects.

Facilities and equipment's-

Stopwatch

Procedure-

The subject lie on her back on the flat surface with finger interlaced behind the head and knees flexed. The partner holds her legs to prevent the subject from sliding. The subject sit-up and touched both the elbows to the knees and return to the starting position as quickly as possible.

Scoring-

The number of correct completed sit-up in one minute was recorded as score.

5. 600 yard/walk-

Purpose-

The purpose of this test was to measure the cardiovascular endurance.

Facilities and equipment's-

A standard 400 meter track, stop watch and measuring tape

Procedure-

All the subjects used standing start. On the signal 'ready' G0! The subjects run 600-yard distance. The running is allowed to be interspersed with walking. Three subjects were allowed to run at a time and the subjects had to cover the distance in the shortest possible time.

Scoring-

The match was started on the signal 'go' and stopped as soon as the subject's chest the finishing line. The time was recorded in minutes and second.

6. Scott and French test-

Purpose-

The purpose of the test was to measure the flexibility of the subjects.

Facilities and equipment's-

20- inch scale and a stable bench.

Procedure-

A 20-inch scale, marked in half inch units was attached to a scale bench so that half the scale is above and half below the level of the bench. The subject stands on toes even with the front edge of the bench and against the side of the scale. The subject bent forward with fingers in front of the scale. The subject then slowly reached downward as far as possible, the fingertip of both hands moved parallel and equally down the scale. The knees were straight throughout the test. Easy warm-up was allowed before taking the test.

Scoring-

The score was the distance on the scale at the lowest point reached by the fingertips in the downward stretch.

7. 50 yard run

Purpose-

The purpose of the test was to measure the speed of the subjects.

Facility and equipment's-

Accordingly measured 50-yard straight distance, measuring tape, wooden clapper, lime powder and watches.

Procedure-

On the signal 'ready' GO! The subjects run 50-yard distance. As the 'V' of the clapper was closed, the timekeeper started their stopwatches at the finish line. The subjects torso reaches the perpendicular plane of the inner edge of the finish line.

Scoring-

The time taken by the subjects from the starting line to the finish line was recorded to the nearest $1/10^{th}$ of a second as the running speed score.

8. Plating ability variable-

Purpose-

The purpose of the test was to measure the playing ability of the subjects.

Procedure-

The coach assessed the subject playing ability that she has observed during the one-month hockey coaching camp.

Scoring-

The coach has graded each individual player out 10 point which measured subjects playing ability.

TABLE-1

Relationship of selected motor fitness variables to playing ability

S. NO.	MOTOR FITNESS VARIABLES	CORELATION COFFICIENT
1	Muscular power	0.04
2	Agility	-0.17
3	Muscular strength	0.34
4	Muscular endurance	0.29
5	Cardiovascular endurance	-0.53*
6	Flexibility	0.64*
7	Speed	-0.40*

N=30
*Significant at 0.05 levels
r.05(29) = 0.361

There was an insignificant relationship between muscular power and hockey playing ability, as the obtained coefficient of correlation was 0.04, which was much less than the required r- value of 0.361.

There was an insignificant relationship between agility and hockey playing ability, as the obtained coefficient of correlation was -0.17, which was less than the required r-value of. 0.361.

There was an insignificant relationship between muscular strength and hockey plating ability, as the obtained coefficient of correlation was less than the required r-value of 0.361.

There was an insignificant relationship between muscular endurance and hockey plating ability, as the obtained coefficient of correlation was 0.29, which was less than the required r-value of 0.361.

There was an insignificant relationship between cardiovascular endurance and hockey plating ability, as the obtained coefficient of correlation was 0.53, which was greater than the required r-value of 0.361.

There was an insignificant relationship between flexibility and hockey plating ability, as the obtained coefficient of correlation was 0.64, which was greater than the required r-value of 0.361.

There was an insignificant relationship between speed and hockey plating ability, as the obtained coefficient of correlation was -0.40, which was greater than the required r-value of 0.361.

DISCUSSION OF FINDING

It is evident from the study that there is a significant relationship between cardiovascular endurance and hockey playing ability. This may be due, to the reason that the game demands high level of cardio-vascular endurance to with stand activities for a longer duration of time without interrupting the consistency in the performance which is necessary to play tough pressing defense and still be able to shoot with accuracy at the end of the game. Thus, the modern hockey game which has been significantly revolutionized require enough cardio- vascular endurance apart from highly developed skill and constant endeavors to achieve high standard of performance. The study is also in agreement with the research study conducted by James H. Frank.

The study further reveals that there is a significant relationship between flexibility and hockey playing ability. It is attributed to the player's ability to move the body joints possession of the ball and also to fake the opponents. Thus, flexibility is necessary to a greater extent in achieving such task in the game of hockey. The study is also in agreement with the research study conducted by Mohan G. Chandershekher.

The study shown that there is a significant relationship between speed and hockey playing ability. This may due to the reason that the nature of the game is such that the players has to continuously on the move with varying pace, it requires incredible speed to overcome the opponents and since it is one of the fastest game in sports world, full speed has to be seldom achieve by the player and in fact infrequently warranted to retain the ball within the team till the goal is scored. The study is also agreement with the research study conducted by Barrett Warren.

The study further reveals that there is an significant relationship between ability. This may be attributed to the fact that at the time of test subjects may not be have given optimum performance in these these items or these subjects may not have developed these motor fitness variables, since they are at sub-junior level only.

CONCLUSION

Within the limitations of the present study and on the finding. Following conclusions may be drawn-

- √ There is an insignificantly high relationship between muscular power and playing ability.
- √ There is an insignificant relationship among agility and playing ability.
- √ Muscular strength and playing ability shows insignificant relationship.
- √ There is an insignificant relationship between muscular endurance and playing ability.
- √ There is a significant relationship between cardiovascular endurance and playing ability.
- √ Flexibility and playing ability shows significant relationship.
- √ There is a significant relationship among speed and playing ability.

APPENDIX

APPENDIX-A (CONTINUED)
RAW SCORES OF MOTOR FITNESS VARIABLES

S. NO.	MUSCULARPOWER (CHIN-UP) SEC.	MUSCULAR ENDURANCE (SIT-UP) (NO.)
01	3	30
02	3	31
03	5	27
04	6	45
05	4	26
06	3	30
07	6	41
08	5	48
09	6	51
10	2	36
11	7	22
12	6	40
13	1	35
14	10	25
15	7	35

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