# Examining the Correlation Between Physical Fitness Components and Hockey Playing Ability

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## Abstract

This study is intent ended to investigate the standard performance physical fitness components to assess the relation with Hockey female playing performance. The data was collected from 82 female players of national level representation of Andhra Pradesh state were selected for this study. The age group of the subjects were ranged from 18 years to 20 years. The standard performance physical fitness components were Cardiovascular Endurance (600 yard dash), Speed (50Mts Sprint), Agility (Illinois Agility), Passive flexibility (Bridge Up), Accuracy (Accuracy test), Reaction ability (Nelson hand reaction), Dynamic balance (Balance), Hand explosive strength (Medicine ball put). The data was analysis done using the Pearson's Product Moment Correlation was set at 0.05 level of significance. The findings discovered that a significant relationship on hockey performance ability indicate that there was significant relationship was coefficient of correlations of Cardiovascular Endurance (0.283), Speed (0.526), Agility (0.268), Passive flexibility (0.263), Accuracy (0.463), Reaction ability (0.295), Dynamic balance (0.253), and Hand explosive strength 0.397) had positive and significant correlations with playing ability of hockey players at 5% level. Other components of physical fitness, i.e. muscular strength (-0.104), muscular endurance (-0.14), muscular power (-0.061),

endurance (0.123) and Active flexibility (0.169) have no significant correlation with playing ability of hockey players. It suggests that Cardiovascular Endurance (0.183), Speed (0.526), Agility (0.268), Passive flexibility (0.263), Accuracy (0.463), Reaction ability (0.295), Dynamic balance (0.253), Hand explosive strength (0.397) have inverse relations with playing performance ability of hockey players.

**Key words**: Training, Performance physical fitness components, Hockey, Playing ability.

## Introduction

Hockey is unquestionably one of the most widespread game in the world. There are different levels of hockey tournaments in different countries. In India national level, state level, inter-university and district level hockey tournament are played. Research on performance of hockey usually focuses on players not on goalkeepers. Such studies attempt to understand those aspect related to the optimization of player's resources and to classify competition demands. Game situations allow coaches to identify some variables that can differentiate the best and worst teams and consequently lead to improve results. A game of field hockey is won by outscoring the opposition.

Field hockey is similar to other field-based hostile games. However, field hockey has some unique features such as the use of a stick and moreover, the design of the stick and the rules governing the use of it. Thus, allowing the use of only the flat side of the stick gives the game an inbuilt asymmetry and forces players into unergonomic postures whilst dribbling a ball. While field hockey involves coordinated multi-joint movements of strength, speed, power and endurance, limited information exists about the movement patterns of field hockey players.

The field hockey, wish to win the any competitions required physical, physiological, anthropometrical and psychological variables. In physical variables mainly association with performance physical fitness or skill related physical fitness components .performance physical fitness components required to get into effective performance in the specific competitions.

## Methodology

### Statement of the problem

This study examine criterion Performance Physical Fitness Components Relation with hockey players Playing Ability.

### Selection of Subjects

82 female hockey players of National Level contribution of Andhra Pradesh state was chosen. The age category of players were vary from 18 to 20 years. During the academic year 2016-17.

### Hypotheses of the Study

As for the result, the performance physical fitness components would be significantly association with hockey players playing performance in the competitions.

### Collection of the Data and Tests

Table-1

| S.No | Physical Fitness Components | Test |
|---|---|---|
| 1 | Speed | 50mts Sprint |
| 2 | Muscular Strength | 16 Pounds Medicine Ball Put |
| 3 | Reaction Ability | Nelson Hand Reaction |
| 4 | Active Flexibility | Sit And Reach |
| 5 | Dynamic Balance | Balance |

| | | |
|---|---|---|
| 6 | Cardiovascular Endurance | 600 Yard Dash |
| 7 | Muscular Endurance | Chin Ups |
| 8 | Agility | Illinois Agility |
| 9 | Hand Explosive Strength | Medicine Ball Put |
| 10 | Endurance | 600 Yard dash |
| 11 | Passive Flexibility | Bridge Up |
| 12 | Muscular Power | Vertical Jump |
| 13 | Accuracy | Accuracy Test |

**Criterion Measurementsin Units**

16 Pounds Medicine Ball : To measure nearest centimeter.

Walking on balancing beam : Best of three attempts the total time is noted in seconds.

50 Mts Run second. : To take time in nearest one tenth of the

Nelson Hand Reaction : Numbers on the timer represent thousand of a second.

Illinois Agility : To recorded in nearest one tenth of the second.

Bridge Up : To measure nearest centimeter.

Sit and Reach : To measure nearest centimeter.

Shooting : To measure accuracy point.

600 Yard Dash : To take in nearest one tenth of the second

Vertical Jump : To measure nearest centimeter.

Chin Ups : To measure number of chin ups in one minute

**Statistical Analysis and Results**

Karl Pearson product moment coefficient of correlation is used to evaluate the data to assess the relation with performance physical fitness components among overall hockey players playing performance.

Table-2

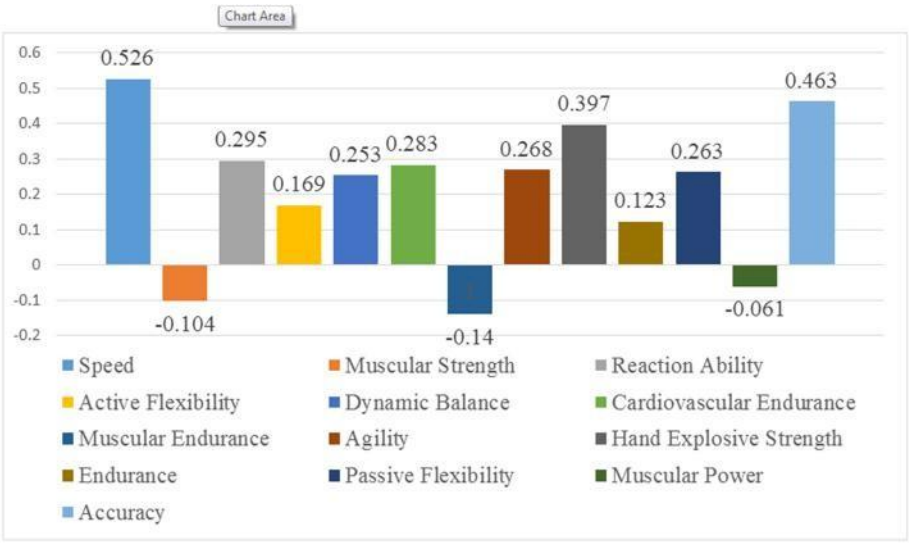
| S.No | Physical Fitness Components | Coefficient Of Correlation 'r' |
|---|---|---|
| 1 | Speed | 0.526* |
| 2 | Muscular Strength | -0.104 |
| 3 | Reaction Ability | 0.295* |
| 4 | Active Flexibility | 0.169 |
| 5 | Dynamic Balance | 0.253* |
| 6 | Cardiovascular Endurance | 0.283* |
| 7 | Muscular Endurance | -0.14 |
| 8 | Agility | 0.268* |
| 9 | Hand Explosive Strength | 0.397* |
| 10 | Endurance | 0.123 |
| 11 | Passive Flexibility | 0.263* |
| 12 | Muscular Power | -0.061 |
| 13 | Accuracy | 0.463* |

N=82, $r_{.05}(80) = 0.217$,*significant at 0.05level.

The above table shows that coefficient of correlation to Cardiovascular Endurance (0.283), Speed (0.526), Agility (0.268), Passive flexibility (0.263), Accuracy (0.463), Reaction ability (0.295), Dynamic balance (0.253), Hand explosive strength 0.397)were significant positive correlation with hockey players playing performance at 0.05 level of significance.

Remaining performance components of physical fitness, i.e. muscular strength (-0.104), muscular endurance (-0.14), muscular power (-0.061), endurance (0.123) and Active flexibility (0.169) have no significant correlation with playing ability of hockey players.

Performance Physical Fitness Components Graphical Representation Table -3




Finally as for the result, this study advise to achieve top performance association with performance physical fitness components were Cardiovascular Endurance (0.283), Speed (0.526), Agility (0.268), Passive flexibility (0.263), Accuracy (0.463), Reaction ability (0.295), Dynamic balance (0.253), Hand explosive strength 0.397) were significant positive correlation with hockey players playing performance at 0.05 level of significance.

## Conclusions

As for the result, Physical Education Teachers, Physical Directors, training coaches, personal trainers and hockey players would concentrate and emphasis on performance Physical Fitness Components are Cardiovascular Endurance (0.283), Speed (0.526), Agility (0.268), Passive flexibility (0.263), Accuracy (0.463), Reaction ability (0.295), Dynamic balance (0.253), Hand explosive strength 0.397) on their training program or training schedule for hockey. It will maintain top performance in the particular competition.

## Reference

Clarke, H.H. (1971). Research Process in Physical Education, 2nd Edition, New Jersey: Prentice.

Hall, Inc., Englewood Cliffs. Barnes, Mildred, J., Kent well, Richard, G.R. Field Hockey, The Coach and Player (2nd Edition). Boston: Allyn and Bascon, Inc., 1979.

Jonson, B.L., & Nelson, J.K. (1998). Practical Measurements for Evaluation in Physical Education. Surjeet Publications.

Nelson, N.P., & Johnson, C.R., (1970). Measurement and Statistics in Physical Education, Belmont, California, Wordsworth Publishing Company Ixc.

Singh, H. (1991). Science of Sports Training. D.V.S. Publication, New Delhi.

Singh, Nabhendra. (2010). A Comparative Study of Motor Performance Level among Categorized Skilled Hockey Players. International Journal of Educational Administration, 2 (2), 403-410.

Horst Wein. The Advanced Science of Hockey London: Pelliam Books Limited, 1981.

Gowri Naidu, B. (2016). Performance Physical Fitness Components as predictors of Kho-Kho performance ability. Res.J. Physical Education Sci., 4(9), 1-3.