# Effect of Flexibility-Motor Component on Field Hockey Goalkeepers at different levels of Sports Participation

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**Abstract**

*The Purpose of the study was to compare, Flexibility-Motor component of male field Hockey Goalkeepers at different levels of sports participation. 45 male hockey goalkeepers aged between 18- 24 years were selected for the purpose of the study. Out of 45 subjects, 15 subjects each were selected from inter-collegiate; inter-university and National level Participation. All the selected subjects belong to U.P. state only. For the study Flexibility- Motor component was selected. Before the collection of data, through administering the tests, all the subjects were assembled and explained the purpose and procedure of the test item and given sufficient time for warm-up before testing. Adequate demonstrations with regard "sit and reach test" was measured on field. ANOVA (analysis of variance) technique was used to compare the mean of different levels of participation followed by LSD (least significant difference) wherever applicable and the significant difference was set at 0.05 levels. The Result of the study showed that a significant difference existed among senior national, inter- university and inter-collegiate level of field hockey goalkeepers in the variable of flexibility-motor component.*

***Keywords:*** *Motor Component, field hockey, goalkeepers levels of sports participation*

## 1. Introduction

Hockey is undoubtedly one of the most popular sports in All over the world. There are different levels of hockey participations or tournaments in different countries. In India national level, state level, inter-university and district level and inter-collegiate hockey tournament are played. Research on performance of hockey usually focuses on players not on goalkeepers. This study attempts to understand those aspect related to the optimization of Goalkeeper's resources and to classify their competition demands. Game situations allow coaches to identify some variables that can differentiate the best and worst goalkeepers and consequently lead to improve the results. A game of field hockey is won by outscoring the opposition. The goalkeeper forms the last line of defence for a team and their task is to intercept shots that are made from within a 14.6m radius from the goal. **Mohammad, (2012)** the ball travel about 110 to 120 km/h to the goalkeeper and goalkeeper have less than one second to react to a shot from the edge of area and move to stop it.

According to **Coach's Goaltending Handbook, (2012)** goalkeepers had several roles in their teams. Goalkeepers protect the goal and works as defensive coordinator. A goalkeeper needs to develop his physical and technical skills, focus and concentration, and their understanding of defensive tactics and strategy. Goalkeeper works on their physical and technical skills all the time.

**Nelson & Johnson, (1970)** the game demanded high level of motor fitness component. It includes several components such as speed, reaction time, endurance, flexibility, and the important of all the coordinative ability. If a player has a large amount of general athletic ability possesses the basic physical components necessary to achieve excellence number of activities, one will still be unable to perform well in a particular sports until he develops the skill specific to that sports.

**Sadri, (1993)** motor component helps in learning faster and also to achieve the high level of performance. The goalkeeping in the field hockey demands agility, muscular coordination, breath holding capacity, quick responses and a great deal of presence of mind. The goalkeeping demands high level of motor fitness and a great deal of presence of mind.

**Harold & Rosemary, (1979)** motor fitness variables have been considered the important prerequisite for sportsman to secure the top level performance in games. There is general agreement among authorities that general and specific motor fitness play a decisive role in one's level of performance in wide range of motor activities. Motor fitness is used to obtain achievement in motor skills.

**England hockey workshop, (2013)** the physical elements that are of specific use to goalkeepers are the key dynamic flexibility elements. Foot speed, balance and agility are crucial and very important for goalkeepers.

Very fewer studies have been conducted regarding the performance of Goalkeeper. Above literature shows a relationship between sports performance and Flexibility- motor component of Goalkeepers, off-course it is new area of exploration, which will provide scientific knowledge to the students/ players/beginners/coaches who want to make their carrier in hockey, especially in goalkeeping, that's why it was selected as research problem to work.

## 2. Method And Materirial

### 2.1 Subjects

Forty five male hockey goalkeepers aged between 18- 24 years were selected for the purpose of the study. Out of forty five subjects, fifteen subjects each were selected from inter-collegiate; inter-university and national level participations. All the selected subjects belong to U.P. state only.

### 2.2 Selection of Variable

For the purpose of study Flexibility- Motor component was selected.

### 2.3 Selection of Test

As per available literature, the following standardized test item was used to collect data on the selected variable and presented below-

#### 2.3.1 Motor Component

| Variable | Test and Tool |
|---|---|
| **Flexibility** | Sit and reach test |

### 2.4 Collection Of Data

Before the collection of data, through administering the test, all the subjects were assembled and explained the purpose and procedure of the test item and given sufficient time for warm-up before testing. Adequate demonstrations with regard sit and reach test was measured on field.

### 2.5 Statistical Procedure

To compare the selected flexibility-motor component of hockey goalkeepers, one way ANOVA (analysis of variance) technique was used to compare the mean of different levels of participation followed by LSD (least significant difference) wherever applicable. All statistical function SPSS v.16 software was used. The level of significant to determine the significant difference was set at 0.05 levels.

## 3. Result

**Table 01: Analysis of variance (ANOVA) of the variable "Flexibility" Motor Component among different levels of participation**

| | Sum of Squares | D.f. | Mean Square | F |
|---|---|---|---|---|
| Between Groups | 8.10 | 2 | 4.05 | 3.57* |
| Within Groups | 47.70 | 42 | 1.14 | |
| Total | 55.80 | 44 | | |

*Significant at 0.05 level of significance

Tabulated F= 3.20

An examination of above cited Table 01 it is evidenced that calculated F value (3.57) was found more than tabulated F value (3.20) at 0.05 level of significance with 42 degree of freedom, hence there is significant difference existed among senior national, inter-university and inter-collegiate levels of field hockey goalkeepers in the variable of flexibility- motor component. To know the exact position of goalkeeper's flexibility- motor component, representing different levels of Participation, least significant difference (L.S.D.) a post hoc test was applied and its result is presented in the following Table 02.

**Table 02: Least Significant Difference (L.S.D.) of the variable "Flexibility" Motor Component among different levels of participation**

| Senior National | Inter-university | Inter-collegiate | Mean Difference | Critical Difference |
|---|---|---|---|---|
| **4.73** | 4.73 | | 0.00 | 0.79 |
| **4.73** | | 3.83 | 0.90* | |
| | 4.73 | 3.83 | 0.90* | |

*Significant at 0.05 level

The comparison of all three levels of Participation was done using L.S.D. and its results are presented in the above cited Table 02, it showed that significant differences were found between senior national and intercollegiate; inter-university and inter-collegiate level field hockey goalkeepers, whereas no significant difference was documented between senior national and inter-university level field hockey goalkeepers in the variable of flexibility- motor component.

## 4. Discussion

The purpose of the study was to compare Flexibility-motor component of hockey goalkeepers at different level of sports participation. The result of the study showed that a significant difference existed among senior national, inter-university and inter-collegiate level of field hockey goalkeepers in flexibility- motor component. **Uppal and Dutta (1980)** also reported same type of results in their study; they worked on motor fitness and found significant difference among the subjects. They said that motor variables like flexibility having a higher degree of associations with the level of performance, and this is also revealed by the findings of our study that higher-levels hockey goalkeepers possesses higher degree of flexibility when they were compared with their at lower levels of participation . This finding have also supported by **Khetmalis, 2012**.

The comparison through L.S.D. among all three levels of participation showed that differences were found between senior national and inter-collegiate; inter-university and inter-collegiate level field hockey goalkeepers in their flexibility-motor component, where as no significant difference was documented between senior national and inter-university level field hockey goalkeepers in the variable of flexibility- motor component, this finding have been supported by **Khetmalis, 2012**. It indicates that both senior national and inter-university level field hockey goalkeepers have the similarities in the variable of flexibility- motor component; it may be because in the both levels almost similar type of training is given to the goalkeepers, **uppal & dutta (1980)** also found the same result.

## 5. Conclusions

On the basis of obtained results of following conclusions may be drawn-

- Significant difference existed among senior national, inter-university and inter-collegiate level of field hockey goalkeepers in the variable of flexibility- motor component.
- The comparison L.S.D. showed that significant differences were found between senior national and inter-collegiate; inter-university and inter-collegiate level field hockey goalkeepers in their flexibility-motor component where as no significant difference was documented between senior national and inter-university level field hockey goalkeepers in this variable.

On the whole it was attributed from the result of the study, that the field hockey goalkeepers of Uttar Pradesh state either, they were national or inter-university hockey goalkeepers having almost similar type of flexibility- motor fitness component.

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