

Analysis the Relationship of Selected Motor Fitness Components on Hockey Skill Performance

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Abstract

The purpose of the study was to find out the relationship of selected motor fitness components on hockey skill performance. For this purpose thirty men hockey players from Cuddalore district, Tamil nadu were selected as subjects. The hockey fundamental skill performances selected as dependent variable. The selected motor fitness components such as speed, explosive power, agility and muscular endurance were taken as the independent variables for this study. The hockey fundamental skill performances selected as dependent variable was correlated with the collected data on independent variables, data were analysed statistically by using simple correlation to find out the relationship between the variables. To compute percentage of association $r^2 \times 100$ was used. Multiple regression of stepwise method was also applied. The result of the study shows a significant association among speed, agility and explosive power on skill performances in hockey but there was no significant association between muscular endurance and skill performance in hockey.

Key Words: *Hockey Skill Performance, Speed, Explosive Power, Agility and Muscular Endurance.*

Introduction

Hockey is the National Game of India & the Government of India celebrates Sports Day on occasion of Major Dhyanchand's birthday i.e. 29th August. There was a time when field hockey was a contact sport. As years passed and rules changed, however, field hockey started to evolve into the modern game as it is today and stick skills became the focal point. Physical contact fell out of the equation and the sport became much more technical. For the purpose of adding excitement to the game, the International Hockey Federation has altered rules to make the game faster. Below is a simplified version of field hockey's rules that will help you become acclimated to the game. There are many type of surface Maud Ground, natural Grass ground & Astroturf.

Hockey is a very popular game, which is played between two teams of 11 players each with hooked or bent sticks and a hard leather or synthetic ball. The object is to drive the

ball into the opponent' goal by hitting it with the stick. The game Hockey combines skills from other games like Ball games. It involves skills like running, dribbling, passing, pushing, stopping, goal keeping etc. Its recreational values and enjoyment level keeps attention of male and females at professional as well as University levels. This is the game of speed, agility, power, endurance and perception. The theme of the game Hockey requires players' athletic ability as well as good motor ability. Field hockey is a team sport that offers a total body workout that includes both aerobic and anaerobic components. The development of motor skills are possible outcomes of effective instruction in the sport of field hockey.

When one has mastered the fundamental skills of the game, he gains a feeling of wellbeing, thus high level of performance in hockey depends upon the mastery over the fundamental skills. The players are skill full in the game when they can make the best decision about where and when to play the ball and then to performs the skills accurately. In any sports discipline the mastery over the fundamental skills is essential to the eventual success. The individual style of execution arises from the manner in which the task is executed in a unique way.

A good hockey player must have the following qualities. He must have the technical ability to perform the various skills that the game of hockey requires. These include scooping, passing, pushing, lifting and dribbling with precision accuracy and confidence. Perfection in pushing, hitting, scooping and dribbling is most important for all good players irrespective of the position they play except the goal keeper. *Hodson, (1971)* says that "to play hockey well it also calls for intelligence, keen eyes, powerful wrists, physical fitness and the speed of mind and body. This shows that the game hockey is of great skills, concentration of the ball and body control and determination. Ability to execute all strokes with real skill and necessary speed are the essential qualities for a top player. A player will have a feeling of confidence when he masters over the skill. *Thus, the skills performance in hockey selected as independent variable for this study.*

High level of performance of hockey player may depend upon the motor qualities. The term motor fitness is used synonymously with general athletic ability. There are many factors that contribute to successful performance in athletic skill. A totally fit individual must have motor qualities also. Motor fitness is also one of the important aspects for doing physical activities. The components of motor fitness are speed, agility, speed endurance, strength, strength endurance, flexibility, co-ordination, explosive power muscular endurance etc. *Among the various motor components speed, agility, explosive power and muscular were selected as independent variable for this investigation.*

Methodology

The purpose of the study was to find out the relationship of selected motor fitness variables such as speed, agility, explosive power and muscular endurance on skill performance of hockey players. To achieve the purpose of the study thirty men hockey players who have represented under-21 and senior teams for cuddalore district in the tamil nadu state champion ship for the year 2019 were selected as subjects. The dependent variable for this study was total performances of the hockey on the fundamental skills such as

dribbling, hitting for accuracy, scooping and pushing. The skill performance measured by sum of all the marks given by the three experts are divided by three to get consolidated score. The player were asked to demonstrate the above said four skills and three experts were asked to grade tow skill performance for 25 marks for each skill and totally for 100 marks. The selected motor fitness components such as speed measured by 50 meters dash, agility measured by shuttle run, explosive power measured by standing broad jump and muscular endurance measured by sit-ups were taken as the independent variables for this study. The collected data were statistically analysed by simple correlation to find out the relationship between the variables to compute percentage of association $r^2 \times 100$ was used. To select the independent variables in order of priorities on dependent variables, multiple regression analysis was used.

Analysis of the Data and Results

The significant relationship of speed, muscular endurance, agility and explosive strength on hockey skill performance were analysed and presented below for each variables separately.

Table-1
Mean and Standard Deviation of Selected Dependent and Independent Variables

Variables	Mean	S.D
Speed	6.74	0.33
Explosive Power	2.47	0.10
Agility	10.58	0.31
Muscular Endurance	48.47	3.86
Skill Performances	57.20	14.15

Table-2
Coefficient of Correlation for Selected Dependent and Independent Variables

Variables	Speed	Explosive Power	Agility	Muscular Endurance	Skill Performances
Speed	-	- 0.020 (4%)	0.785* (61%)	-0.122 (1.4%)	-0.929* (86%)
Explosive Power	-	-	- 0.260 (6.8%)	- 0.201 (4%)	0.135 (7.8%)
Agility	-	-	-	- 0.114 (1.3%)	- 0.837* (70%)
Muscular Endurance	-	-	-	-	- 0.009 (0.01%)
Skill Performances	-	-	-	-	-

** Significant at .05 level.*

(The table value required for significance with df 28 was 0.361)

Table-2 shows that the relation ship between speed and explosive power is -0.02 and the percentage of association is 4%. The relationship between speed and agility is 0.785 and the percentage of association is 61%. The relationship between speed and muscular endurance is -0.122 and the percentage of association is 1.4%. The relationship between speed and skill performances is -0.929 and the percentage of association is 86%. The relationship between explosive power and agility is -0.260 and the percentage of association is 6.8%. The relationship between explosive power and muscular endurance is -0.201 and the percentage of association is 4%. The relationship between explosive power and skill performances is 0.135 and the percentage of association is 7.8%. The relationship between agility and muscular endurance is -0.114 and the percentage of association is 1.3%. The relationship between agility and skill performances is -0.837 and the percentage of association is 70%. The relationship between muscular endurance and skill performances is -0.009 and the percentage of association is .01%.

Table-3
Selection of First, Second and Third Independent Variable

Dependent Variable	Selected independent variable	R Square	Percentage of Association
Skill Performances in Hockey	Selection of First Independent Variable		
	Speed	0.863	86%
	Selection of Second Independent Variable		
	Speed and Agility	0.893	89%
	Selection of Third Independent Variable		
	Speed, Agility and Explosive Power	0.910	91%

Table-3 shows that the speed is the most important motor quality required for better skill performance in hockey. The R square value is 0.863 and the percentage of association is 86%. Further the table-3 shows that in addition to speed the agility was selected as an important motor quality required for better skill performances in hockey. The R square value is 0.893 and the percentage of association is 89%.

Further, table-3shows that in addition to speed and agility, the explosive power is selected as an important motor quality for better skill performance in hockey. The R square value is 0.910 and the percentage of association is 91%. The muscular endurance was not selected for the better skill performance in hockey.

The relationship of selected first, second and third independent variables with hockey skill performances are graphically illustrated in figure-I, II and III.

Figure-I: Selection of First Independent Variable

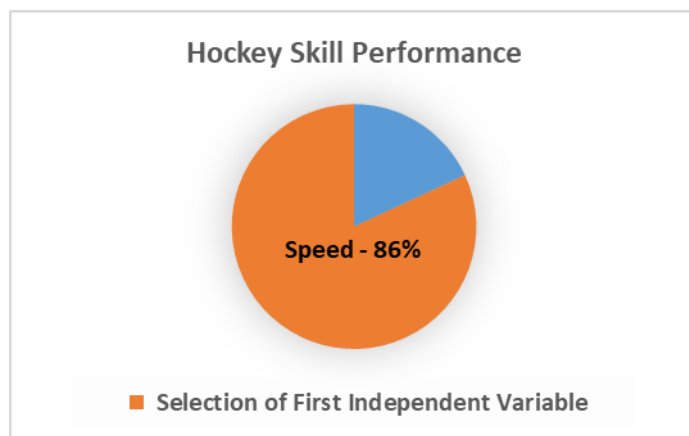


Figure-II: Selection of Second Independent Variable

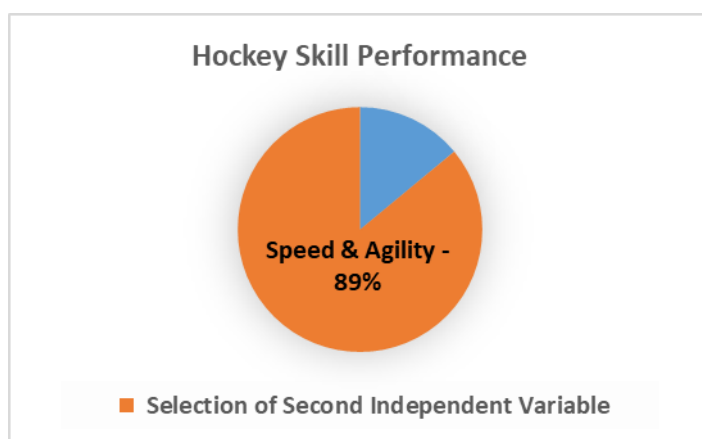
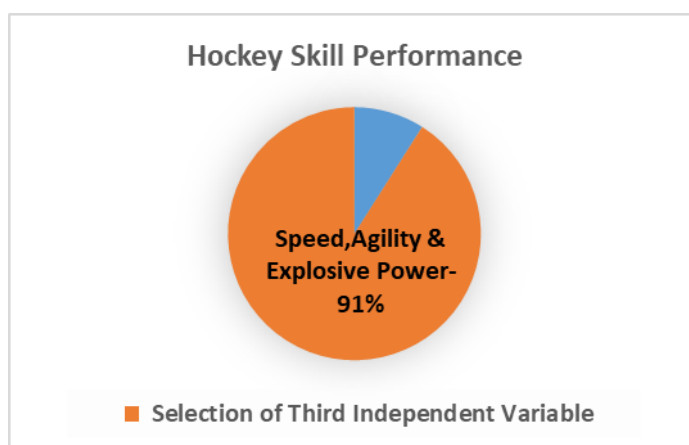


Figure-III: Selection of Third Independent Variable



Discussion

Motor fitness components are amongst the pre-requisite for the skill development and skill performance of any game and sports, including hockey. Better motor fitness contributes towards the efficient skill performance in games and sports. Therefore, a player who does not possess required motor fitness cannot perform well at higher levels. Speed and agility are the

important components to perform most of the skills in hockey. Speed indicates rate at which a movement is executed and agility indicates coordination. Hence fast execution of movement that is combined with coordination skills helps to perform better. Power is the fundamental motor quality. The explosive power is the combination of speed and power. This is also an important quality required for better skill performance in hockey. In our study, the speed is selected as first independent variable, the agility and explosive power are selected as second and third independent variables. Hockey is the game in which players should have these qualities in order to be success. Research finding of present study are in line with the findings of *Reilly et al., (2000)* which elucidated that speed and explosive power are considered as prerequisites for the success of youth soccer players. Further, they revealed that elite soccer skill performers were found to have better in sprinting at short distances, vertical jumping, agility and explosive power as compared to sub-elite youth soccer players. Similar results were reported by *Mitra et al., (2013)* which revealed significant correlation with regard to power, agility, and speed and cardio respiratory endurance among basketball player. Research conducted by *Ghosh, (2015)* supported the findings of present study while illuminating the significant positive relationship of soccer skill performance with motor fitness components. Further, the results of this study is in conformity to the findings of *Nabhendra Singh, (2010)*, *Meckel et al., (2009)*, *Aziz et al., (2000)*, *Elferink et al., (2004)* and *Lemmink et al., (2004)*.

Conclusion

From this study we may conclude that speed, agility and explosive power are the motor fitness variables which were having significantly correlation with skill performance of hockey players. There was no significant association between muscular endurance and hockey skill performance.

References

1. Aziz, A. R., Chia, M. and Teh, K. C. (2000). The relationship between maximal oxygen uptake and repeated sprint performance indices in field hockey and soccer players. *Journal of Sports Medicine and Physical Fitness*, 40: 195–200.
2. Chris Hodson. A Guide for Selectors, Selected Field Hockey and Lacrosse Articles, Washington: AAHPER, 1971, 27
3. Elferink - Gemser, M.T., Visscher, C., Lemmink, K. A. P. M. and Mulder, Th. (2004). Relation between multidimensional performance characteristics and level of performance in talented youth field hockey players. *Journal of Sports Sciences*, 22: 1053–1063.
4. Ghosh, B. (2015). Relationship of Selected Physical Variables with Soccer Performance of Women Soccer Players. *International Educational E-Journal*, 4(4), 1-8.
5. Lemmink, K. A. P. M., Elferink-Gemser, M. T. and Visscher, C. (2004). Evaluation of the reliability of two field hockey-specific sprint and dribble tests in young field hockey players. *British Journal of Sports Medicine*, 38: 138–142.

6. Meckel, Y., Machnai, O., Eliakim, A. (2009). Relationship among repeated sprint tests, aerobic fitness, and anaerobic fit-ness in elite adolescent soccer players. *Journal of Strength and Conditioning Research* 23(1):163–169.
7. Mitra, S., Bandyopadhyay, S. & Gayen, A. (2012). Relationship of Selected Motor Fitness Components with the Performance of Basketball Player. *Indian Journal of Applied Research*, 3(8), 616-617.
8. Nabhendra Singh. (2010). A Comparative Study of Motor Per-formance Level among Categorized Skilled Hockey Players. *International Journal of Educational Administration*, 2(2):403-410
9. Reilly T, Bangsbo J, Franks A. (2000). Anthropometric and physiological predispositions in soccer. *J Sport Sci*, 18: 669-683.