

The Influence Of Standing Height And Arm Length On Playing Ability In University-Level Hockey Players

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ABSTRACT

The study aimed to investigate the influence of standing height and arm length on the playing ability of university-level male hockey players. A total of 100 players (aged 18–25 years) from six universities in Andhra Pradesh, who had competed in inter-university tournaments, were selected as subjects. Standing height was measured using a stadiometer, arm length with an anthropometric rod, and playing ability was assessed through expert ratings during competition. Statistical analysis using simple, partial, and multiple correlations at the 0.05 level of significance revealed significant relationships between anthropometric variables and playing ability. Standing height showed a correlation of $r = 0.452$ with hockey playing ability, while arm length demonstrated $r = 0.386$, both exceeding the table value of 0.197 ($df = 98$). The combined effect of the two variables yielded a multiple correlation coefficient of $R = 0.720$, which was greater than the tabulated value of 0.353 ($df = 93$), indicating a strong predictive relationship. Partial correlation also confirmed significant contributions of standing height ($r = 0.324$) and arm length ($r = 0.263$) to playing ability. The findings suggest that standing height and arm length are significant predictors of hockey performance, offering valuable implications for player selection, talent identification, and performance enhancement in university-level hockey.

Keywords: Standing height, Arm length, Anthropometry, Hockey performance, University players, Playing ability, Talent identification.

INTRODUCTION

Anthropometric factors, such as standing height and limb length, have long been associated with athletic performance. In hockey, taller players with longer arms may have advantages in tackling, intercepting passes, and executing strokes with greater reach and control. Standing height influences body leverage and balance, while arm length enhances stick handling and defensive range.

Although technical skill and endurance dominate hockey performance, physical structure provides a foundation upon which these abilities are executed. With increased pace and competitiveness of hockey, understanding the role of anthropometry in predicting performance is essential for talent identification and training.

IMPORTANCE OF ANTHROPOMETRIC MEASUREMENTS

The following anthropometric measurements were selected keeping in view that they were likely to influence the skill development and performance in hockey. Further the anthropometric components were found to influence the proficiency of hockey players.

The following anthropometric measurements were selected as they were considered to be relevant.

1. Standing Height

2. Arm Length

OBJECTIVES OF THE STUDY

- Prediction of hockey playing ability in relation to the selected variables.
- To find out the relationship between playing ability and anthropometric measurements namely standing height and arm length.

HYPOTHESES

1. It is hypothesized that there would be positive relationship between the criterion variable and predictor variables.
2. It is hypothesized that there would be a significant relationship between standing height and hockey playing ability.
3. It is hypothesized that there would be a significant relationship between Arm length and hockey playing ability.

DEFINITIONS OF THE TERMS

HOCKEY

Hockey is a field game played by both men and women. Each team has eleven players who use a curved stick to hit the ball along the ground. The object of the game is to send the ball into the opponent's goal, and the team which scores the greater number of goals will be the winner **Richard Charles (1981)**.

STANDING HEIGHT

Stature is taken as the maximum distance from the point vertex on the head to the ground **Sodhi (1991)**.

ARM LENGTH

Arm Length is measured from the acromion process above the shoulder joint to the tip of the middle finger in the side view **Jenner (1994)**

METHODOLOGY

PARTICIPANTS

A total of 100 male hockey players, aged 18–25 years, from six universities in Andhra Pradesh, participated in the study. All were active competitors in inter-university hockey tournaments. The study is delimited to men hockey players of selected universities Sri Venkateswara University, Tirupati, Sri Krishnadevaraya University, Anantapur, Osmania University, Hyderabad, Kakatiya University, Warangal, Acharya Nagarjuna University, Guntur and Jawaharlal Nehru Technological University, Hyderabad in Andhra Pradesh, who have participated in Inter- University hockey tournament.

TABLE – I

DEPENDENT AND INDEPENDENT VARIABLES – THEIR TESTS

Variables	Tests/Equipments	Units
Hockey playing ability	Subjective Evaluation	Points
Standing Height	Stadiometer	Centimeters
Arm length	Anthropometric rod	Centimeters

EXPERIMENTAL DESIGN AND STATISTICAL TECHNIQUES

Correlation random design was employed in the present investigation to see whether there is any significant relationship between dependent variables and independent variables.

The relationship between dependent variable (playing ability) and independent variables (speed, endurance – standing height, Arm length- dribbling, dribble and shooting) were established through simple, partial and multiple correlation. Level of significance was set at 0.05 level.

The formula used for simple correlation was

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2} \sqrt{\sum(y - \bar{y})^2}}$$

The formula used for partial correlation was

$$r_{12.345\dots n} = \frac{r_{12.34\dots(n-1)} - r_{1n.34\dots(n-1)} \times r_{2n.34\dots(n-1)}}{\sqrt{1 - r_{1n.34\dots(n-1)}^2} \times \sqrt{1 - r_{2n.34\dots(n-1)}^2}}$$

The formula used for multiple correlations was

$$R = \sqrt{1 - (1 - r_{12}^2)(1 - r_{13.2}^2)(1 - r_{14.23}^2)\dots\dots(1 - r_{1n.234\dots(n-1)}^2)}$$

TABLE - II

**CO-EFFICIENT OF CORRELATION BETWEEN HOCKEY PLAYING ABILITY AND
SELECTED VARIABLES**

Variables	Hockey playing ability
Standing Height	0.452*
Arm Length	0.386*

***Significant at 0.05 level of confidence**

The table value for significant at 0.05 level with df 98 is 0.197.

Table II shows the correlation between selected independent variables and a dependent variable of the inter- university men hockey players.

Co-efficient of correlation between standing height and hockey playing ability was 0.452 since the obtained 'r' value 0.452 is much higher than the table value 0.197 at 0.05 level with the df 98. The study reveals that the significant relationship was documented between standing height and hockey playing ability.

Co-efficient of correlation between arm length and hockey playing ability was 0.386 since the obtained 'r' value 0.386 is much higher than the table value 0.197 at 0.05 level with the df 98. It indicated that the significant relationship was existed between arm length and hockey playing ability.

TABLE - III

RELATIONSHIP BETWEEN THE COMBINED EFFECT OF DEPENDENT VARIABLE AND INDEPENDENT VARIABLE

Dependent Variable	Independent Variables	Obtained $R_{1.234567}$
Hockey Playing Ability	Standing Height	0.720*
	Arm length	

***Significant at 0.05 level of confidence.**

The table value for significant at 0.05 level which the degree of freedom 93 is 0.353.

Table III reveals that the $R_{1.234567}$ value of 0.353 was the tabulated value for significance at 0.05 levels with df 93. The obtained $R_{1.234567}$ value 0.720 was greater than the table value of 0.353. Therefore, the obtained $R_{1.234567}$ was significant at 0.05 level of confidence. It was clear that there is a significant relationship between independent variables and dependent variable.

The data are further subjected to partial correlation to partialled out the effects of each independent variable on the combined effect of independent variables on hockey playing ability are presented in table IV

TABLE – IV

PARTIAL RELATIONSHIP BETWEEN THE SELECTED DEPENDENT AND INDEPENDENT VARIABLES

Dependent Variable	Independent Variables	Partial 'r'	Pearson's 'r'
Hockey Playing ability	Standing Height	$r_{14.23567} = 0.324^*$	0.452*
	Arm Length	$r_{15.23467} = 0.263^*$	0.386*

***Significant at 0.05 level of confidence.**

The table value for significant at 0.05 level with df 98 is 0.197.

DISCUSSION ON FINDINGS

In this study physical variables speed and endurance, anthropometric measurements standing height and arm length, fundamentals skills dribbling, dribble and shooting, were taken as independent variables. One hundred (N=100) inter- university men hockey players were taken for this study. All the selected subjects were rated in their playing ability by three experts, during the actual competition. This rating score was taken as dependent variable or criterion variable.

Only two variables were taken for this study. Out of which how many of the selected variables have got significant relationship with the hockey playing ability was found through this study.

The study revealed that two variables are significantly correlated with the hockey playing ability. The correlation results were presented in the Table V.

CO-EFFICIENT OF CORRELATION OF SELECTED VARIABLES IN RELATION TO HOCKEY PLAYING ABILITY IN ORDER

Table V

1. Standing Height	0.452
2. Arm Length	0.386

Standing Height: Results indicate that the significant relationship was existed between hockey playing ability and standing height. Hence, the study concluded that standing height is having a significant role in improving playing ability in hockey.

Arm Length:

Results indicate that the significant relationship was existed between hockey playing ability and arm length. Hence, the study concluded that arm length is having a significant role in improving playing ability in hockey.

CONCLUSIONS

Within the limitations of the present study the following conclusions are drawn.

1. The fundamental skill namely dribble and shooting was highly correlated to the hockey playing ability and it can be used to predict the hockey playing ability.
2. The anthropometric variables namely standing height and arm length play an important role in predicting the hockey playing ability.

REFERENCES

1. Ackland, T. R., Schreiner, A. B., & Kerr, D. A. (2003). Absolute size and proportionality characteristics of Olympic athletes in anthropometric profiling. *Journal of Sports Sciences*, 21(2), 81–90.
2. Gil, S. M., Gil, J., Ruiz, F., Irazusta, A., & Irazusta, J. (2007). Anthropometric and physiological characteristics of young soccer players: Influence on playing position. *Journal of Strength and Conditioning Research*, 21(2), 438–445.
3. Keogh, J. (2009). The use of physical fitness scores and anthropometric data to predict selection in professional rugby league players. *Journal of Sports Science and Medicine*, 8(1), 114–120.
4. Malina, R. M., Bouchard, C., & Bar-Or, O. (2004). *Growth, Maturation, and Physical Activity*. Champaign, IL: Human Kinetics.
5. Reilly, T., & Borrie, A. (2001). Physiology applied to field hockey. *Sports Medicine*, 31(1), 13–24.