BIOMECHANICAL ANALYSIS OF INSTEP KICK IN SOCCER RELATED TO ACCURACY

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ABSTRACT

Soccer is a dynamic game in which many of the important skills to master are interceptive actions, such as kicking with the lower limb, heading and, in the case of the goalkeeper, catching and punching the ball. The game of soccer is one of the most popular team sports worldwide. The purpose of the study was to identify the relationship between the accuracy and selected kinematic variables in instep kick by the soccer players. The group consisted of fourteen male, age ranging from 18 to 25 years. Two cameras were used for the purpose of data collection placed in two plane saggital and frontal to kicking direction. The variables include knee, C.G, hip. A valid accuracy test was used for the target framing and score were collected. Correlation statistical technique was used for the data analysis. The result find out that knee angle ($p<0.05$) with the ball accuracy. The players attain high stable on the knee and with slow of the angular knee velocity enhance the accuracy in instep kick.

Keywords: hip, knee, accuracy and C.G.

Introduction

Modern soccer originated in Britain during the 19th century. The game was called 'Folk Football' in 14th and 15th century. The game has been played in village and town with their local customs which include fewer rules for the game. The developments of industrialization and urbanization effects reduce of game due to time and space available of working hours. Later in year 1843 standardize and codify rule were made by University of Cambridge graduates who form football club (Alegi).

Nowadays soccer is the world's most popular game in the number of participant, fans and clubs. The development of science and technology has great influence all researchers in the particular sports field. The numerous studies have done in sports performance and develop the athlete in every aspects of the game. The used of Biomechanics method which lead to increase the sports equality in every country (A.R. Ismail). The objective of the study was to find out the kinematics variables of instep kick with related to accuracy of the ball. Accuracy is most necessary that has to be improving during skill training. The study provides idea/knowledge of instep kick in soccer, which can help the coach's, sports teacher to analysis the accuracy technique in instep kick.

Materials

Ten trails were given to each player and all the data were collected by using the qualified officials, valid test accuracy for kicking in soccer was used (JT Finnoff). The score of the accuracy were measured in centimetres. The angle was measured to it nearest point degree.

Method

For the purpose of study 14 male football players from L.N.I.P.E, Gwalior who participates in intervarsity age was ranging from 18 to 25 years. Further fulfilment of the study purposive sampling technique was used for the purpose of the present study.

Result

Correlation coefficients were used to find out significant relationship between the selected kinematic variables and accuracy at level of 0.05.

During instep kick mean and standard deviation of accuracy is 72.7056 ± 29.72604 (See Table 1), knee angle at back swing is 95.3357 ± 5.26644 (See Table 1), C.G during back swing is 91.9737 ± 3.90223 (See Table 3), and hip angle at back swing is 28.7214 ± 1.52706 (See Table 5).

The product moment correlation coefficient of accuracy and knee angle at kicking position is **-0.223** with *p*-value 0.008 (See Table 2), accuracy and C.G. during kicking position is **0.103** with p-value is **0.**228 (See Table 4), and accuracy and hip angle kicking position is **0.001** with p-value is **0.994** (See Table 6).

Discussion and Findings

Significance relationship was found in knee angle with accuracy. So it is concluded that good accuracy in instep kick during the match can create less effort and great chance of scoring. The study supports findings of **A. Lees and L. Nolan (2002)** on "three dimensional kinematic analysis of the instep kick under speed and accuracy condition." Where two professional players were taken as the subject in this study and 10 trails has given to the each player to perform the penalty kick. The study finds out that there is significant in the knee and toes joint. This study was also quite similar with the study because both the study tells about the important role of the knee angle in the accuracy in instep kick.

References

J.P. Verma (2013). *Data Analysis in Management with SPSS Software*. India: Springer

J.P. Verma (2014). *Statistics for Exercise Science and Health with Microsoft Office Excel.* New Jersey: John Wiley & Sons.

Ismal et al. (2010). Biomechanics analysis for right leg instep kick, Journal Applied Science ISSN 1812-5654

Finnoff et al. (2002). A valid and reliable method for measuring the kicking accuracy of soccer players, J Sci Med Sport, P:348-53.

Lees et al. (2002). Three-Dimensional kinematics analysis of the instep kick under speed and accuracy condition, Science and Football IV, P- 16-21

Alegi, P. C., Joy, B., Rollin, J., Giulianotti, R. C., & Weil, E. (2020, January 22). Football. Retrieved from https://www.britannica.com/sports/football-soccer#ref29605

Table: 1
Mean, Standard Deviation of Accuracy and Knee Angle in Instep Kick in Soccer

	Mean	Std. Deviation	N
Accuracy	72.7056	29.72604	140
Knee Angle at Backswing	95.3357	5.26644	140

Table: 2
Correlation Matrix of Accuracy and Knee Angle in Instep Kick in Soccer Along with P Value

		Accuracy	Knee Angle at backswing
Accuracy	**Pearson Correlation**	1	-.223
	Sig. (2-tailed)		**.008**
	N	140	140
Knee Angle at Backswing	**Pearson Correlation**	-.223	1
	Sig. (2-tailed)	**.008**	
	N	140	140

Table:3
Mean, Standard Deviation of Accuracy and C.G. During Instep Kick in Soccer

	Mean	Std. Deviation	N
Accuracy	72.7056	29.72604	140
C.G during back swing	91.9737	3.90223	140

Table: 4
Correlation Matrix of Accuracy and C.G. During Instep Kick in Soccer along with P Value

		Accuracy	C.G at back swing
Accuracy	**Pearson Correlation**	1	**.103**
	Sig. (2-tailed)		**.228**
	N	140	140
C.G at back swing	**Pearson Correlation**	**.103**	1
	Sig. (2-tailed)	**.228**	
	N	140	140

Table:5
Mean, Standard Deviation of Accuracy and Hip Angle in Instep Kick in Soccer

	Mean	Std. Deviation	N
Accuracy	72.7056	29.72604	140
Hip angle at back swing	28.7214	1.52706	140

Table: 6
Correlation Matrix of Accuracy and Hip Angle in Instep Kick in Soccer along with P Value

		Accuracy	Hip angle at back swing
Accuracy	**Pearson Correlation**	1	**0.001**
	Sig. (2-tailed)		**0.994**
	N	140	140
Hip angle at back swing	**Pearson Correlation**	**0.001**	1
	Sig. (2-tailed)	**0.994**	
	N	140	140

Figure 2: Accuracy of ball