

Kinematical Analysis of Ankle Angle of kicking leg at different phase of Instep kick in Soccer

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ABSTRACT

Objectives: - The purpose of the study was to compare the Ankle Angle of kicking leg at different phase of Instep kick in Soccer. **Methodology:** - For the present study the sample consisted of 8 male University level Soccer players were purposively selected from Banaras Hindu University. The age ranged of the subjects between 18 to 25 years. 'Ankle Angle of kicking leg' measured by Silicon coach pro-7 in degree and 'Instep kick performance was' measured by open goal shooting by subjects and maximum ball travel in air measure as highest performance of the subjects. For the analysis of data Analysis of variance (ANOVA) test was applied. The level of significance was set at 0.05 level. **Conclusions:** - By the help of study it is concluded that there is significant difference was found between Ankle Angle of kicking leg and different phase of Instep kick Performance.

Keywords: - Kinematical Analysis, Ankle Angle and Instep kick.

INTRODUCTION

Today's Soccer has no need of any Introduction. The game of Soccer is intrinsically attractive to millions of people worldwide. It provides immense enjoyment to those playing or watching the game. Events such as the World Cup elevate human emotions and curiosities in a manner that almost defies logic. Approaching and analysing Soccer phenomena in an objective manner pose no mean challenge to both professionals in Soccer business and to sports science Researchers. (Reilly, 1993).

Placekicking is an adapted striking pattern of the lower extremity where the foot impacts the ball as it lies on the ground. A variety of sports require skill in this movement, which we are calling the soccer instep kick. (Knudson, D., & Morrison, C. (1997).

Kinematic analysis are the important is understanding the mechanisms of athlete's injuries. For instance, if the axis of a blow to the head runs through the centre of gravity of the skull, as occurs when a boxer falls backwards and strikes his occiput on the mat, translatory motion results, and the injury is usually forward opposite to the point of impact. In the case of uppercut, however, the axis of the blow transverses the skull obliquely. There is translation of the centre of the mass, the greater its acceleration and hence the greater the possibility of injury. It follows that in such cases the spinal cord as well as the brain, may suffer lesions. (Uppal, A.K., 2009).

Objective of the Study

The purpose of the study was to compare the Ankle Angle of kicking leg at different phase of Instep kick in Soccer.

METHODOLOGY

For the present study the sample consisted of 8 male University level Soccer players were purposively selected from Banaras Hindu University. The age of the subjects ranged between 18 to 25 years. The study was confined to Right footed Kickers only. Instep kick divided into three phase i.e. from loading Phase, Contact phase and Follow Through phase. (Pronk, 1991).

Procedure of Data Collection

According to availability of two Casio EX-F1 high speed cameras were used, which have frequency from 60 to 300 frames per second (f/s). The data were recorded from sagittal plane and frontal plane. The data was analysed by Silicon coach-pro7 motion analysis software.

Statistical Technique

The Statistical analysis of data pertaining to the study were collected on 8 male Soccer players. To compute the analysis of data Analysis of Variance (ANOVA) test was applied. The level of significance was set at 0.05. All statistical functions were performed with the SPSS (v.20) software.

FINDINGS AND RESULTS

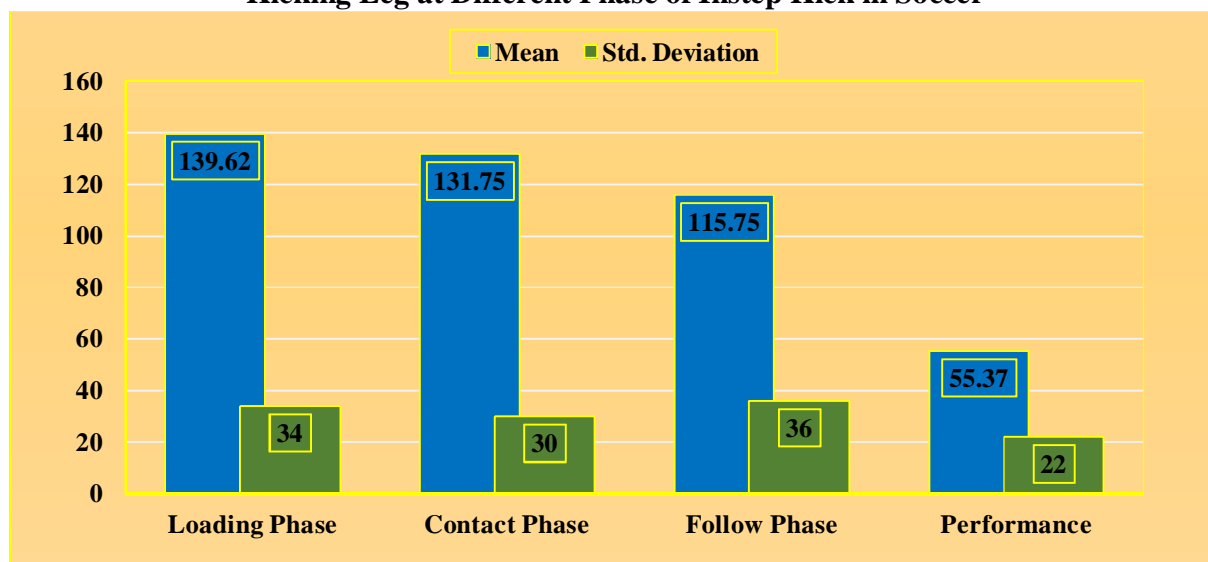
Result were made on the basis of the findings of the present study. The researcher reached at the results of this empirical investigation which is presented by the respective table-1, 2 and 3 figure-1.

Table: - 1: Descriptive Statistics of Kinematical Analysis of Ankle Angle of Kicking Leg at Different Phase of Instep Kick in Soccer

Selected Variables	N	Mean		Std. Deviation	Sum	Range
	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic
Loading Phase in degree	8	139.62	4.44	34.00	1117	12.56
Contact Phase in degree	8	131.75	3.38	30.00	1054	09.56
Follow through Phase in degree	8	115.75	4.57	36.00	926	12.92
Performance in meter	8	55.37	2.63	22.00	443	07.44

It is evident from table – 1 that, Mean, Std. deviation, scores of Ankle Angle of kicking leg at different phase of Instep kick in Soccer have been found as follow: Loading phase in degree 139.62 (± 34), Contact Phase in degree 131.75 (± 30), Follow through Phase in degree 115.75 (± 36) and Performance in meter 55.37 (± 22), respectively whereas Standard Error and Range of scores was found as follow Contact Phase in degree 4.44 (± 12.56), Contact Phase in degree 3.38 (± 09.56), Follow through Phase in degree 4.57 (± 12.92) and Performance in meter 2.63 (± 07.44) respectively.

Figure-1: Graphical Representation of Means and Std. Deviation Score of Ankle Angle of Kicking Leg at Different Phase of Instep Kick in Soccer



Graphical Representation of Comparison of Means and Std. Deviation of Loading Phase, Contact Phase and Follow through of Instep kicking technique in relation to Ankle Angle of kicking leg. Graph shows that the Ankle Angle of kicking leg at Loading Phase in Instep kick was found greater than Ankle Angle of kicking leg at Contact phase as well as Ankle Angle of kicking leg at Follow Through phase in Instep kicking technique in Soccer.

Table-2: Analysis of Variance of the Ankle Angle of Kicking Leg at Different Phase of Instep Kick in Soccer

Source of Variation	Sum of Squares	df	Mean Square	F-Value
Between Groups	2368.08	2	1184.04	8.54*
Within Groups	2912.87	21	138.71	

* Significant at 0.05 level of significance
 $F_{0.05}(2, 21) = 3.47$

Table- 2 revealed that there was significant difference among Ankle Angle of kicking leg at different phase of Instep kick in Soccer, as obtained F-ratio was (8.54), which was higher than the tabulated value of (3.47), at 0.05 level with (2, 21) degree of freedom.

Since the one way Analysis of Variance was found significant in relation to Ankle Angle of kicking leg at different phase of Instep kick, the LSD test was applied to find out the differences of the paired means among Ankle Angle of kicking leg at different phase of Instep kick in Soccer.

TABLE-3: Least Significant Difference (LSD) Post Hoc Test for the Paired Means among Ankle Angle of Kicking Leg at Different Phase of Instep Kick in Soccer

(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Std. Error	Sig.
Loading Phase	Contact Phase /Contact	07.87	5.89	.195
	Follow through Phase	23.87*	5.89	.001
Contact Phase	Loading Phase	-07.87	5.89	.195
	Follow through Phase	16.00*	5.89	.013
Follow through Phase	Loading Phase	-23.87*	5.89	.001
	Contact Phase	-16.00*	5.89	.013

*. The mean difference is significant at the 0.05 level.

Table- 3 revealed that there was significant difference between Ankle Angle of kicking leg at Loading Phase in Instep kick & ankle angle of kicking leg during Follow Through Instep kick and ankle angle of kicking leg at Contact Phase in Instep kick & ankle angle of kicking leg at during Follow Through in Instep kick of male soccer players in relation to ankle angle of kicking leg, as mean differences values were (23.87) & (16.00) respectively.

Discussion of the Study

As per the objective of the study was to compare the Ankle Angle of kicking leg at different phase of Instep kick in Soccer. Through this study, we found that there was significant difference found among Ankle Angle of kicking leg at different phase of Instep kick Performance of Soccer players.

This may be attributed to the fact that, The Instep kick is the most powerful kick in Soccer. It is most commonly used for long-range shooting. Ankle joint is the key joint of kicking leg during Different phase of Instep kick in Soccer. Ankle Angle is planter flexed and mainly utilized due to Right footed kickers. It is also creating optimum path of acceleration and enhancing range of motion for good Instep kick. The kicking leg must have a long back swing with lock Ankle for a powerful contact and its play an important role to cover maximum distance by ball. Long back swing of kicking leg and plantar flexion ankle of kicking leg is responsible for ultimate reach of motion. The present study also strongly agrees with **Lees (1996)** in his investigation reported that in kicking large impact of foot with the ball serves to Forcefully plantar flexing the ankle and it will do so until the bones at the ankle joint reach their extreme range of motion.

CONCLUSION

On the basis of the obtained results from the present study the following conclusions were drawn:-

1. There was significant difference found among Ankle Angle of kicking leg at different phase of Instep kick Performance of Soccer players.
2. The finding also suggest that, the Ankle joint is the key joint of kicking leg during Different phase of Instep kick in Soccer.

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