

## KINEMATIC ANALYSIS OF INSTEP KICK IN SOCCER RELATED TO BALL VELOCITY

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### ABSTRACT

*Soccer is a sports requiring high level of skilled. Good instep kick can create more power ball velocity and it gives less time to react the goal keeper, chance of scoring goal. This skill is mainly used by the midfielder and striker in the game. The purpose of present study was to find out the analysis of instep kick in soccer related to ball velocity. As nowadays soccer is a very fast game and it need more skill players to create more advantage in the field. Instep kick is mostly use while attacking and scoring the goal in soccer game. The subject, 14 male intervarsity player's age was ranging from 18 to 25 years. The GO PRO cameras were place in saggital and frontal plane for the purpose of videography. The velocity of the ball was calculated by using the Kinovea software 08.25. The correlation statistical technique was used for analysis of data. The linear variables like ball velocity, knee extension velocity and the kinematic variable knee angle. The study find out knee extension velocity ( $p < 0.05$ ). The players achieved high knee extension velocity when kicking the instep kick.*

**Keywords:** *knee extension velocity, ball velocity, knee angle*

### Introduction

Soccer is sports which considered being the fast- pace, strategy game played by every men, women and kids in the world. Soccer leagues is the professional have gained by millions of fans around the globe. The game is played by two teams with eleven players each including goalkeepers in rectangular field. The ball is played only by feet, head and other body parts expect hand. (FIFA Soccer) . Professional soccer leagues are main parts of the sports business called many spectator, fans, media and sponsors. Soccer club are the main source of income from the spectators (Ali Aycan).

Soccer present is the most famous sports on the world. It connects nations, culture, continents and is one of the most successful businesses. Yet it wasn't always so, and the story of football developed from the early pre 13<sup>th</sup> century started it tribute to its overwhelming and ever developing popularity. The violent street brawls, started

from soccer during that time and once it banned by royal kings. But it re-started again, rules were made and leagues were started. Slowly the game made lot of popular. Once the games become the part of the public consciousness, the passion spread, the soccer growth with the new chapter (Macdonald). The objective of the study was to find out the kinematics variables of instep kick with related to ball velocity. The study provides the knowledge of instep kick used in soccer game and also gives information of technique applied in instep kick in soccer which can help to the coaches, Physical education teachers.

### Materials

Ten trail were given to each players (14 x 10 = 140) and all the data were collected by using the qualified officials, distance were measured in metres and speed were measured in m/s, the angle were measured to its nearest point degree. Kinovea .0.8.15 software was used to measure angle.

**Method**

For the purpose of study 14 male football players who participate in intervarsity age was ranging from 18 to 25 years. 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 ball velocity at level of 0.05.

During instep kick mean and standard deviation of ball velocity is **25.5965 ± 1.37534** (See Table 1), leg extension velocity is **11.7911± 0.87761** (See Table 1), knee angle at backswing is **95.3357± 5.26644** (See Table 3) and knee angle at ball contact is **140.2500± 3.04434** (See Table 5).

The product moment correlation coefficient of ball velocity and leg extension velocity is **0.377** with *p*-value **0.000** (See Table 2), ball velocity and knee angle at backswing is **-0.012** with *p*-value **0.885** (See Table 4), and ball velocity and knee angle at ball contact is **-0.129** with *p*-value **0.129** (See Table 6).

**Table: 1**  
Mean, Standard Deviation of Ball Velocity and Leg Extension Velocity Instep Kick in Soccer

	Mean	Std. Deviation	N
Leg extension velocity	11.7911	0.87761	140
Ball velocity	25.5965	1.37534	140

**Table: 2**  
Correlation Matrix of Ball Velocity and Leg Extension in Instep Kick in Soccer Along with P Value

		Leg velocity	Ball velocity
Leg extension velocity	Pearson Correlation	1	<b>0.377</b>
	Sig. (2-tailed)		<b>.000</b>
	N	140	140
Ball velocity	Pearson Correlation	<b>0.377</b>	1
	Sig. (2-tailed)	<b>.000</b>	
	N	140	140

**Table: 3**

Mean, Standard Deviation of Ball Velocity and Knee Angle at Back Swing Instep Kick In Soccer

	Mean	Std. Deviation	N
Knee Angle at Backswing	95.3357	5.26644	140
Ball Velocity	25.5965	1.37534	140

**Table: 4**

Correlation Matrix of Ball Velocity and Knee Angle at Back Swing Instep Kick in Soccer Along With P Value

		Knee angle at backswing	Ball Velocity
Knee Angle at Backswing	Pearson Correlation	1	<b>-0.012</b>
	Sig. (2-tailed)		<b>.885</b>
	N	140	140
Ball Velocity	Pearson Correlation	<b>-0.012</b>	1
	Sig. (2-tailed)	<b>.885</b>	
	N	140	140

**Table: 5**

Mean, Standard Deviation of Ball Velocity and Knee Angle at Ball Contact Instep Kick in Soccer

	Mean	Std. Deviation	N
Ball Velocity	25.5965	1.37534	140
Knee Angle at Ball Contact	140.2500	3.04434	140

**Table: 6**

Mean, Standard Deviation of Ball Velocity and Knee Angle at Ball Contact Instep Kick in Soccer

		Ball Velocity	Knee Angle Contact
Ball Velocity	Pearson Correlation	1	<b>-0.129</b>
	Sig. (2-tailed)		<b>.129</b>
	N	140	140
Knee Angle at ball Contact	Pearson Correlation	<b>-0.129</b>	1
	Sig. (2-tailed)	<b>.129</b>	
	N	140	140

**Figure 1: Knee angle at back swing phase**

## Discussion and Findings

Significance relationship was found only in knee extension velocity with ball velocity. So it is concluded the high ball velocity instep kick during the match can create good advantage to counter attack and the players can score from distance. This study supports the finding of **Amiri Khorasani (2009)** and **Alen Kapidzic (2014)** that higher knee extension velocity can produce more amount of ball velocity in instep kick in soccer. Thus the study was similar on the relationship between the knee extension velocity and ball velocity.

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