

Analysis of ball velocity for different groups of positional soccer players

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DOI: <https://doi.org/10.33545/26647710.2020.v2.i1a.14>

Abstract

Background: Now a day's is modern age and soccer is the most popular game all over the world. The aim of the present study determines the ball velocity of different positional soccer players for instep kick and high drive kick.

Methods: A total of 22 soccer players were selected from the Bangladesh Institute of Sports (BKSP) on the basis of the purposive sampling technique. Among the seven were Defenders; nine Midfielders and six Forwards players. They use to stay in the campus hostel. The velocity of the kicking ball was measured using mobile software "Adidas Snapshot".

Results: The velocities of instep kick for different groups of subjects were 82.14 km/h for the defender; 79.77km/h for midfielder and 79km/h for forwarding groups. The ball velocity for high drive kick was 86.42 km/h for the defender; 85.22 km/h for the midfielder and 82.33 km/h for forwarding groups. The ball velocity for high drive kick as indicated by mean values was greater than that of instep kicks for all the groups.

Conclusion: The ball velocity for high drive kick appears to be solidly greater than that of instep kick.

Keywords: soccer player, instep kick, high drive kick, velocity, differentiation

Introduction

Soccer is the most popular game all over the world in general. Soccer is a game that requires Motor fitness and Game performance. Soccer is a complex sports activity, whose success depends on various variables and factors, including physiological abilities and technical skills [1]. Soccer includes different explosive movements like kicking and passing the ball, tackling, falling, jumping, starting, and stopping [2]. Among them, one of the most important is kicking [3]. Lago-Penas *et al.* objectified that players who shoot more during the match are more likely to be successful than others who shoot less [4]. Kicking ability represents the most important soccer-specific skill [3]. In fact, an analysis of the 2010 Soccer World Cup revealed that 80.69% of the goals were achieved by kicking [5]. Moreover, although accuracy is an important factor, kicking performance in soccer has been evaluated predominantly via the maximum ball velocity [6].

Therefore, improving the maximal kicking velocity with both the preferred and non-preferred leg must be an important objective for soccer coaches. It should be noted that most kicks are usually done using feet (instep kick or high drive kick) [7, 8]. The analysis of the dynamic movement of kicking has shown that high drive kick is more precise, whereas the instep kick is the fastest type of kick in soccer [9, 10].

To develop goal-scoring odds, the player should reach the highest level ball speed possible, which depends on several variables, such as the speed of the foot (distal segment) upon impact as well as the quality of the ball kick-foot impact. A

reviewed existing literature about the effects on maximum ball kicking speed of age, gender, limb dominance, practice duration, competition level, playing position, and variations in the kicking technique [8]. At 15–19 years, the kicking pattern is completely achieved (with maximum ball kicking speed = 80–103 km/h) [3].

Therefore, the aim of the current study was: a) to determine the ball velocity of different positional soccer players for instep kick and high drive kick. b) Present study help to understand the difference between the instep and high drive kick with respect to ball velocity c) It would also be possible to understand the difference in ball velocity among different positional soccer players.

Materials and methods

Participants

A total of 22 soccer players were selected from Bangladesh Institute of Sports (BKSP) on the basis of purposive sampling technique. Among them seven were Defenders; nine Midfielders and six Forwards players. They use to stay in campus hostel. All of them were Bangladesh National team players in different age level competitions.

Instruments

The velocity of the kicking ball was measured using mobile software "Adidas Snapshot".

The total background has been presented in fig -1

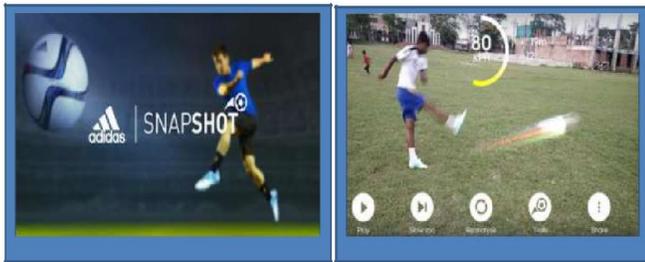


Fig 1

Statistical analysis

The collected data were analyzed using appropriate statistics methods. Mean and standard deviation, was collected as the measure of central tendency.

Mean is calculated as a measure of central tendency by using the formula:

$$\bar{X} = \frac{\sum X}{N}$$

The standard deviation (SD) is calculated as the measure of variability by using the formula:

$$SD (\sigma) = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

The formula used for t-test

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

Results

Table 1: Showing Mean value, Standard deviation (SD), Mean Difference and ‘t’ value of three groups soccer players in Instep Kick and high drive kick

Groups	Mean value		Mean Difference km/h	‘t’ value	Remarks
	Instep km/h	High drive km/h			
Defenders (n=7)	82.14±4.97	86.42±5.88	4.28	1.30*	Not significant
Midfielders (n=9)	79.77±7.08	85.22±6.74	5.45	1.67**	Not significant
Forwards (n=6)	79±5.36	82.33±6.80	3.33	1.06***	Not significant

*Required table value at 0.05 level for df-6 = 5.96

**Required table value at 0.05 level for df-8 = 5.04

***Required table value at 0.05 level for df-5 = 5.87

It is evident from the calculated values of ‘t’ that these were lesser than the required table values to be significant at 0.05 level of significance. So, it is understood that the difference

between velocities of two different types of kick was not statistically significant for any of these three selected groups of players.

Table 2: Showing Mean Difference and ‘t’ value of three groups soccer players in Instep kick

Mean ball velocity of Groups (km/h)			Mean difference km/h	‘t’ value	Remarks
Defenders (n=7)	Midfielders (n=9)	Forwards (n=6)			
82.14	79.77		2.37	0.76	Not significant
82.14		79	3.14	1.09	Not significant
	79.77	79	0.77	0.24	Not significant

It is seen from table number 2 values that the calculated ‘t’ values were lesser than the required table value. So it is clear

that the inter groups difference in mean velocity in instep kick was statistically not significant.

Table 3: Showing Mean value, Mean Difference and t value of three groups soccer players in High drive kick

Mean ball velocity of Groups (km/h)			Mean difference km/h	‘t’ value	Remarks
Defenders (n=7)	Midfielders (n=9)	Forwards (n=6)			
86.42	85.22		1.2	0.35	Not significant
86.42		82.33	4.09	1.15	Not significant
	85.22	82.33	2.89	0.88	Not significant

It is seen from table number 3 values that the calculated ‘t’ values were lesser than the required table value. So it is clear that the inter groups difference in mean velocity in High drive kick was statistically not significant.

Discussion

The main objective of the present study is through light on the ball velocity of different positional soccer players for instep kick and high drive kick. The instep kick relies on the upper

surface of your foot, also called “the laces”. The high drive kick or lofted kick is the soccer skill used to play the long ball. The velocities of instep kick for different groups of subjects were 82.14 km/h for the defender; 79.77km/h for midfielder and 79km/h for forwarding groups. The ball velocity for high drive kick was 86.42 km/h for the defender; 85.22 km/h for the midfielder and 82.33 km/h for forwarding groups. The ball velocity for high drive kick as indicated by mean values was greater than that of instep kicks for all the groups. But inter

the group's difference was statistically not significant. The ball velocity for different groups was found to be height among the groups for both instep and high drive kick. The forward group was found to have the lowest velocity among the groups for both instep and high drive kick. Both in the chases, the inter groups were statistically not significant. Sometimes we saw the velocity of the instep kick is more than the high drive kick because of the placement of the ball, accuracy and objectives. A limitation of this study was that we used a too long-lasting warm-up (45 min) for a kicking protocol. A shorter 10-minute warm-up plus 5-minute active stretching would have been more appropriate for our protocol [3]. Another limitation was that we did not check for fatigue evidence. Another way for controlling for fatigue advent could have been to allow each player to decide his own pace over protocol [11]. Motivation and will the subject were limited for the study. Non – availability of standard equipment and technology was a genuine limiting factor of the study.

Conclusion

The ball velocity for high drive kick appears to be solidly greater than that of instep kick. Though not significant the ball velocity of defender groups of player solidly higher than that of midfielder and forward groups of player.

Acknowledgement

The researchers are grateful to the soccer players who have participated in this study on a voluntary basis and Bangladesh Institute of Sports (BKSP) authorities for providing time to collect data. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Competing interests

The authors declare that they have no competing interests.

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