

## A Study of Kinematical Parameters I9N Instep Kicking in Soccer

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**Abstract :** Introduction: Soccer is a game which draws more attention in different countries especially in Brazil. Kicking among different skills in soccer and soccer players is an excellent role for the success and preference of a team. The way of point gaining in this game is passing the ball over the goal lines which are gained by shoot skill in attack time and or during the penalty kicks. Regarding the above assumption, identifying the effective factors in instep kicking in different distances shoot with maximum force and high accuracy or pass and penalty kick, may assist the coaches and players in raising qualitative level of performing the skill. Purpose: The aim of the present study was to study of a few kinematical parameters in instep kicking from 3 and 5 meter distance among the male and female elite soccer players. Methods: 24 right dominant lower limb subjects (12 males and 12 females) among Tehran elite soccer players with average and the standard deviation ( $22.5 \pm 1.5$ ) & ( $22.08 \pm 1.31$ ) years, height of ( $179.5 \pm 5.81$ ) & ( $164.3 \pm 4.09$ ) cm, weight of ( $69.66 \pm 4.09$ ) & ( $53.16 \pm 3.51$ ) kg, %BMI ( $21.06 \pm .731$ ) & ( $19.67 \pm .709$ ), having playing history of ( $4 \pm .73$ ) & ( $3.08 \pm .66$ ) years respectively participated in this study. They had at least two years of continuous playing experience in Tehran soccer league. For sampling player's kick; Kinemetrix Motion analysis with three cameras with 500 Hz was used. Five reflective markers were placed laterally on the kicking leg over anatomical points (the iliac crest, major trochanter, lateral epicondyle of femur, lateral malleolus, and lateral aspect of distal head of the fifth metatarsus). Instep kick was filmed, with one step approach and 30 to 45 degrees angle from stationary ball. Three kicks were filmed, one kick selected for further analyses. Using Kinemetrix 3D motion analysis software, the position of the markers was analyzed. Descriptive statistics were used to describe the mean and standard deviation, while the analysis of variance, and independent t-test ( $P < 0.05$ ) were used to compare the kinematic parameters between two genders. Results and Discussion: Among the evaluated parameters, the knee acceleration, the thigh angular velocity, the angle of knee proportionately showed significant relationship with consequence of kick. While company performance on 5m in 2 genders, significant differences were observed in internal - external displacement of toe, ankle, hip and the velocity of toe, ankle and the acceleration of toe and the angular velocity of pelvic, thigh and before time contact. Significant differences showed the internal - external displacement of toe, the ankle, the knee and the hip, the iliac crest and the velocity of toe, the ankle and acceleration of ankle and angular velocity of the pelvic and the knee.

**Keywords :** biomechanics, kinematics, soccer, instep kick, male, female

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