

[Sports Biomech.](#) 2010 Jun;9(2):98-114.

The effects of target distance on pivot hip, trunk, pelvis, and kicking leg kinematics in Taekwondo roundhouse kicks.

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Abstract

The study purpose was to investigate the effects of target distance on pivot hip, trunk, pelvis, and kicking leg movements in Taekwondo roundhouse kick. Twelve male black-belt holders executed roundhouse kicks for three target distances (Normal, Short, and Long). Linear displacements of the pivot hip and orientation angles of the pelvis, trunk, right thigh, and right shank were obtained through a three-dimensional video motion analysis. Select displacements, distances, peak orientation angles, and angle ranges were compared among the conditions using one-way repeated measure ANOVA ($p < 0.05$). Several orientation angle variables (posterior tilt range, peak right-tilted position, peak right-rotated position, peak left-rotated position, and left rotation range of the pelvis; peak hyperextended position and peak right-flexed position of the trunk; peak flexed position, flexion range and peak internal-rotated position of the hip) as well as the linear displacements of the pivot hip and the reach significantly changed in response to different target distances. It was concluded that the adjustment to different target distances was mainly accomplished through the pivot hip displacements, hip flexion, and pelvis left rotation. Target distance mainly affected the reach control function of the pelvis and the linear balance function of the trunk.

PMID: 20806845 [PubMed - in process]