

## ORIGINAL RESEARCH

# KINEMATIC AND KINETIC RELIABILITY OF TWO JUMPING AND LANDING PHYSICAL PERFORMANCE TASKS IN YOUNG ADULT WOMEN

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## ABSTRACT

**Background.** Jumping and landing tasks are commonly used functional measurement tools to assess lower extremity performance in female athletes. However, few studies have established the number of trials needed to achieve reliability of measurement for evaluating landing mechanics.

**Objective.** To determine the reliability of peak hip and knee joint angles and peak ground reaction forces during two anterior-posterior unilateral functional tasks performed by young women.

**Methods.** Sixteen young women ( $28.5 \pm 4.2$  years;  $162.2 \pm 4.8$  cm;  $59.5 \pm 8.1$  kg) participated in this investigation. Each participant performed five trials of a 40-cm single leg drop jump and two trials of a ten-repetition, 20-cm, single leg up-down hop task during the same session. Peak hip and knee joint angles, peak vertical ground reaction forces, and ground contact time were measured. Intraclass correlation coefficients (ICC), standard

errors of measurement, and 95% confidence intervals were calculated for all variables measured during multiple trials for both tasks.

**Results.** The five-trial mean ICC values of the drop jump were  $\geq 0.75$  for all variables. The single and two to four-trial average ICC values yielded good reliability for only some variables. Single-trial and two-trial mean ICC values for the up down test were  $\geq .77$ .

**Discussion and Conclusion.** The use of five-trial averages for the 40-cm drop jump and a single trial for the 20-cm, up-down hop task showed that for these functional tasks performed by young adult women, reliable measurement of lower extremity landing mechanics can be achieved.

**Key Words:** reliability, kinematics, landing, kinetics, hop test

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