

Reliability of Hip Rotation Range of Motion Measurements using Smartphone Based Goniometry among Expert and Novice Clinicians- A Preliminary Report.

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Aim: To determine if a smartphone 'clinometer' application can provide reliable measurements of hip rotation range of motion among expert and novice clinicians.

Methods: Seated internal and external hip rotation were assessed bilaterally in 17 young healthy males (mean $\pm$ SD age: 19.92 $\pm$ 1.7 years, height: 184.7 $\pm$ 5.2cm, mass 74.1 $\pm$ 4.7kg) using a smartphone 'clinometer' application. Measurements were obtained in a randomised, blinded fashion by an experienced (>30yrs) and novice (<1yr) clinician, and repeated approximately three hours later. Each measurement was read and recorded by a university student assistant. During testing subjects were seated upright with their feet elevated off the floor. A smartphone was placed 5cm proximal to the lateral malleolus to record resting rotation angle. The hip was then passively rotated (internally and externally) until the therapist felt a firm end feel and prior to any compensatory pelvic movement. The initial resting rotation angle was then subtracted from this final angle to give a measure of internal and external rotation. Average values of three measurements for each limb were entered into analysis. Intraclass correlation coefficients (ICCs) with 95% confidence intervals were used to assess intertester and intratester reliability. Paired *t*-tests assessed for any systematic intertester bias. A P-value was considered significant at <0.05.

Results: Excellent relative intertester (ICC 0.92-0.95) and intratester (ICC 0.80-0.95) reliability for expert and novice clinicians were demonstrated for internal and external hip rotation ROM. There were no significant intertester differences (P>0.05).

Conclusion: Smartphone based goniometry of hip rotation displays high intertester and intratester reliability among novice and expert clinicians, suggesting it is a viable goniometric tool.

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