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Original Research

The Reliability of Portable Fixed Dynamometry During Hip and Knee Strength Assessments

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Abstract

Context: Insufficient lower extremity strength may be a risk factor for lower extremity injuries such as noncontact anterior cruciate ligament tears. Therefore, clinicians need reliable instruments to assess strength deficiencies.

Objective: To assess the intrarater, interrater, intrasession, and intersession reliability of a portable fixed dynamometer in measuring the strength of the hip and knee musculature.

Design: Crossover study.

Setting: Sports medicine research laboratory.

Patients or Other Participants: Three raters (A, B, C) participated in this 2-phase study. Raters A and B tested 11 healthy college graduate students (2 men, 9 women) in phase 1. Raters A and C tested 26 healthy college undergraduate students (7 men, 19 women) in phase 2.

Main Outcome Measure(s): The dependent variables for the study were hip adductor, hip abductor, hip flexor, hip extensor, hip internal rotator, hip external rotator, knee flexor, and knee extensor peak force.

Results: The phase 1 intrasession intraclass correlation coefficients for sessions 1, 2, and 3 ranged from 0.88 to 0.99 (SEM = 0.08–3.02 N), 0.85 to 0.99 (SEM = 0.26–3.88 N), and 0.92 to 0.96 (SEM = 0.52–2.76 N), respectively. Intraclass correlation coefficients ranged from 0.57 to 0.95 (SEM = 1.72–13.15 N) for phase 1 intersession values, 0.70 to 0.94 (SEM = 1.42–9.20 N) for phase 2 intrarater reliability values, and 0.69 to 0.88 (SEM = 1.20–8.50 N) for phase 2 interrater values.

Conclusions: The portable fixed dynamometer showed good to high intrasession and intersession reliability values for hip and knee strength. Intrarater and interrater reliability were fair to high, except for hip internal rotation, which showed

Volume 45, Issue 4 (July/August 2010)

< Previous Next >

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poor reliability.

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top