The Reliability and Validity of a Luggage Scale for Gluteal Strength Measurements

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BACKGROUND: The most commonly used clinical method for measuring gluteal muscle strength is manual muscle testing (MMT). This method is subjective and lacks reliability and specificity. An alternative, objective tool to measure muscle force is a handheld dynamometer (HHD), but its cost limits its use in the clinical setting. No research has been done on cost-efficient alternatives for measuring gluteal strength.

PURPOSE: To determine the reliability and validity of a luggage scale compared to a HHD for measuring gluteal muscle strength.

METHODS: Hip extension and abduction strength of thirty-one healthy males and females aged 18-35 years was tested using a HHD and luggage scale. Subjects performed three repetitions of maximal voluntary isometric contractions for each muscle group using each measurement tool. Testing procedures were repeated after fifteen minutes of rest by a second examiner.

RESULTS: The luggage scale exhibited similarly high intrarater and interrater reliability compared to the HHD. Intrarater reliability was 0.97 and 0.97 using the luggage scale and 0.95 and 0.98 using the HHD for hip extension and abduction strength, respectively. Interrater reliability was 0.83 and 0.96 using the luggage scale and 0.85 and 0.95 using the HHD for hip extension and abduction strength, respectively. Moderate correlation between the luggage scale and HHD was found for hip extension strength (0.68), while high correlation was found for hip abduction strength (0.93).

CONCLUSION: The luggage scale is a reliable, valid, and cost-efficient clinical tool for measuring hip extension and abduction strength.