Muscle imbalances at the hip have been linked to a variety of musculoskeletal conditions. To objectively assess these imbalances, a valid, cost-effective means of measuring strength is needed.

Handheld dynamometers (HHD) are used to obtain objective measures of muscle strength and have been found valid and reliable at other joints. HHDs have been found to have high interrater and intrasession reliability in measuring hip extension strength using a prone standing position. To date, there is limited information on the validity of the HHD in measuring peak hip extension strength.

To establish the intrasession reliability of the prone standing position as measured by novice therapists.

To evaluate the validity of the HHD in measuring peak hip extension torque compared to the Biodex dynamometer.

To determine the validity of taking single- versus multi-trial measures.


Peak hip extension strength measures were collected in 3 ways:
- HHD - prone standing position (Figure 1)
- Biodex Prone – prone standing position
- Biodex Supine – supine position with hip in 90° flexion

Prone standing positions were compared to the reference supine Biodex position recommended by the manufacturer.

Data were analyzed using peak torques calculated from: trial one, the mean of all five trials and the mean of three trials where the highest and lowest values from the five trials were excluded.

Intrasession reliability was assessed using intraclass correlation coefficients (ICC). Criterion validity for multi and single-trial measures was determined using regression analyses and Pearson product moment correlation coefficients (r).

Limitations:
- Small sample size
- Potential for muscle fatigue
- Using an untested dynamometer

Future directions:
- Assess the validity of the HHD in patients with specific musculoskeletal conditions that may present with muscle imbalances at the hip.

Conclusions:
- Novice therapists, with practice, are able to use the HHD with a high level of reliability.
- The HHD in the prone standing position is valid in measuring peak hip extension strength in healthy adults aged 20-53.
- Single trial measures with the HHD have high correlations with 3 trial average values and therefore may be clinically appropriate.