

Comparison between Eforto® and Jamar® dynamometers: Accuracy and Validity of Grip Force Measurement

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OBJETIVES

1. Evaluate the accuracy, reliability, and validity of the Eforto® in measuring grip strength vs. the Jamar® hydraulic model.
2. Analyse its diagnostic capacity to detect low muscle strength according to the EWGSOP2 cut-off points.
3. Explore the correlation of fatigability with other functional tests.

Eforto® digital dynamometer



METHODS

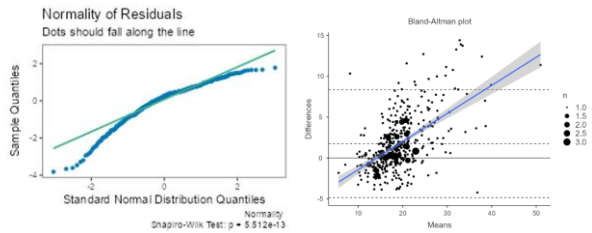
A cross-sectional randomized trial was conducted with 415 community-dwelling older adults (mean age: 75.3 ± 6.5 years) participating in the "Programa de Revitalización Geriátrica (PReGe)", Universidad de Salamanca. Assessments were conducted according to the Southampton protocol. Lower limb strength and physical performance tests were assessed. Correlation and agreement between Eforto® and the Jamar® dynamometer were analysed using Bland-Altman plots and ICC, while diagnostic accuracy was assessed using ROC curves.

RESULTS

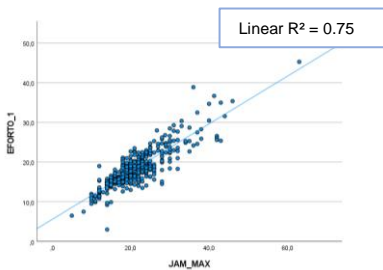
Basal characteristics

n = 415	♀ (n=347)	♂ (n=68)
Age (years)	75 ± 6.5	77.5 ± 6.8
Height (cm)	153 ± 6.0	163 ± 6.0
Weight (kg)	65.0 ± 11.5	74.0 ± 10.0
BMI (kg/m ²)	27.9 ± 4.6	27.8 ± 3.4
ASMI (kg/m ²)	5.9 ± 0.9	6.9 ± 0.9
SPPB	11.0 ± 1.0	11.0 ± 2.0
5STS (s)	11.3 ± 2.9	11.4 ± 3.5
30CS (n)	14 ± 5.0	14 ± 5.0
HG Jamar® (kg)	19.5 ± 4.6	32.1 ± 8.2
HG Eforto® (kg)	17.3 ± 3.5	25 ± 6.1
Fatigability (s)	56.0 ± 31.5	53.1 ± 28.0
Sarcopenia (n,%)	27, 7.8	10, 14.7

Magnitude Bias in the Agreement between Jamar®-Eforto®

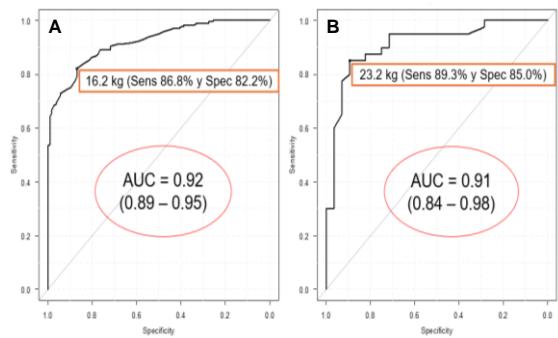


Correlation Jamar®-Eforto®



Pearson's Correlation	r	p
Jamar®-Eforto®	0.82	<0 00
Fatigability-30CS	0.64	<0 00

Diagnosis of Low Handgrip Strength [Women (A) and Men (B)]



Agreement	ICC (95% CI)	p
Jamar®-Eforto®	0.80 (0.76 - 0.83)	0.403
Intra-rater reliability	0.94 (0.93 - 0.95)	0.771
Inter-rater reliability	0.83 (0.80 - 0.86)	0.520

CONCLUSIONS

Eforto® dynamometer is valid and reliable for grip strength assessment in older adults, with high diagnostic accuracy but a size-dependent bias. A correction equation is required. Its relationship with the *Chair-Stand Test* suggests value in the assessment of muscle fatigue.