Comparison of Body Composition Assessment Methods in Healthy Adults

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Introduction

This study aimed at comparing direct segmental multi-frequency bioelectrical impedance (BIA) with air displacement plethysmography (ADP - Bod Pod) in adults. We also investigated the effect of recent water intake on the assessment of body composition by these methods.

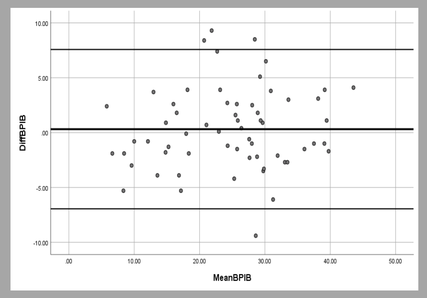
Methods

- Study Sample: 61 healthy adults
  - 24 males with mean age 25.5
  - 38 females with mean age 22.2
- Mean BMI was 25.5 kg/m^2 for males and 22.2 kg/m^2 for females
- Body composition was measured using three different assessment devices:
  - Bod Pod
  - InBody 570
  - Seca 514
- Water intake protocol:
  - Females: 1,000 mLs in 500 mL-increments
  - Males: 2,000 mLs in 1,000 mL-increments

Bod Pod x Seca

Pearson's correlation coefficient:

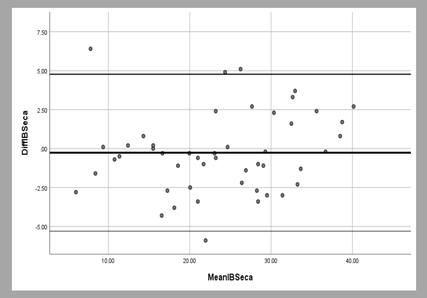
r=0.93, p<0.001



InBody x Seca

Pearson's correlation coefficient:

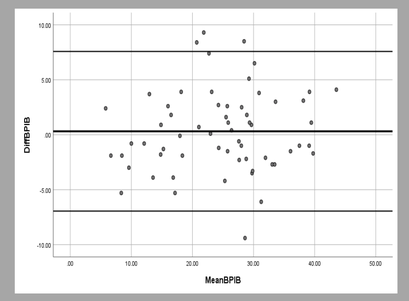
r=0.96, p<0.001

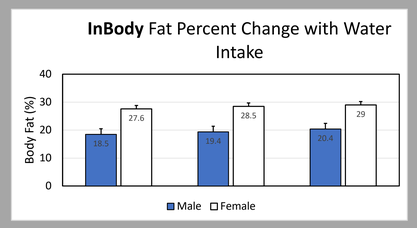


Bod Pod x In Body

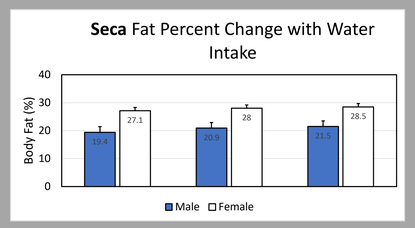
Pearson's correlation coefficient:

r=0.92, p<0.001

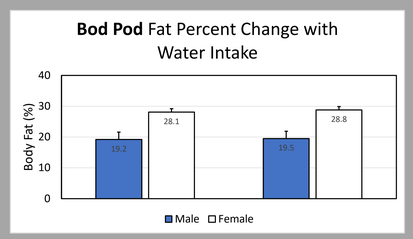




Mean body fat %: 27.6% (females) and 15.5% (males)

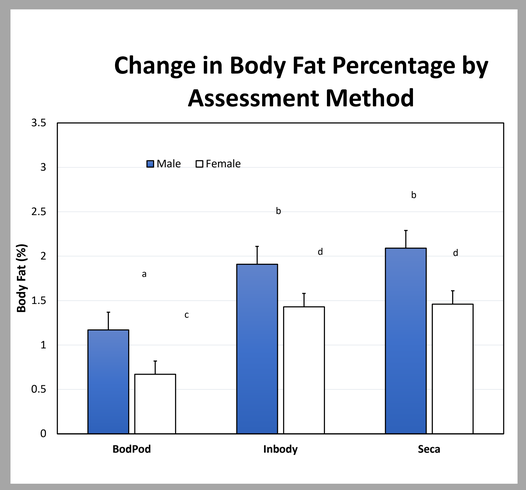


Mean body fat %: 27.1% (females) and 19.4% (males)



Mean body fat %: 28.1% (females) and 19.2% (males)

Results



Change in body fat (%) after drinking 1,000 mL water:

- InBody:
  - Males: +0.86%
  - Females: +1.43%
- Seca:
  - Males: +1.49%
  - Females: +1.46%

Change in body fat (%) after drinking 1,000 mL water:

- Bod Pod:
  - Males: +1.17%
  - Females: +0.67%

Main findings:

- Multi-frequency BIA is highly correlated with ADP (Bod Pod)
- The different BIA instruments are more closely correlated (*r*=0.96, *p*<0.001*)*
- There was higher variability in body fat % between BIA instruments for males than females