

Differences in body density and percent body fat found by different methods of evaluating body composition

Kayo Shitara, author

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Abstrak

ABSTRACT

The objectives of this study were 1) to quantify the differences in body densities and percent body fat using various methods for evaluating body composition (e.g., underwater weighing (UWW), air displacement plethysmography (ADP), skinfold caliper (SKF) measurement, ultrasound (US), bioelectrical impedance analysis (BIA), and dual-energy x-ray absorptiometry (DXA)), and 2) to examine the relationship between trends of the differences in body density and percent body fat obtained by these methods and characteristics of morphology and body composition. To this end, the body compositions of 73 healthy male adults were measured using UWW, ADP, SKF, US, and BIA. Twenty-seven of these 73 subjects underwent further measurement using DXA. Differences in body densities determined with ADP, SKF, and US were compared with those measured using UWW as a reference, and the differences in percent body fat estimated with UWW, ADP, SKF, US and BIA were compared with those measured by DXA as a reference. The results of this study indicate that 1) ADP is useful as a method for evaluating body density, as the results differed insignificantly from the reference method and showed no systematic errors due to differences in morphological characteristics and body composition, and 2) UWW measurements exhibited the smallest difference in percent body fat from the reference method, however, more than in any other method, there were systematic errors due to differences in morphological characteristics and body composition, specifically, trunk composition.