Gender Differences of Body Composition Across Four Different Forms of Assessment

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This project was completed for academic purposes only. While it contains a research component, its sole purpose is to demonstrate academic progress.

Introduction

The present study aimed to evaluate the differences in body composition, specifically body fat percentage (BF%), fat-free mass (FFM), and body mass index (BMI), across four forms of assessment. It was hypothesized that male subjects, on average, would display consistently lower BF% when compared to females across all four body composition data collection methods, and results would be highly correlated between the four.

The BOD POD acted as the present study’s gold standard due to it being one of the most accurate methods of assessing BF% (Collins et al., 1999). It was assumed that women would have a higher BF% than men on average. According to Roberts and Roberts (1997), a healthy range of body fat for women is 20% to 25%, and a healthy range of body fat for men is 10% to 15%. A BF% over 20% for men and 30% for women is considered an indication of obesity. Additionally, Akindele et al. (2016) suggested that as BMI increases there is a proportion, meaning they will report lower BF% than their BMI.

According to Solomon and Bouloux (2006), individuals with greater amounts of FFM% tend to have higher VO2max values and better anaerobic capabilities. Therefore, individuals with higher FFM% often perform better than those with greater BF%.

Methods

Eight males and eight females participated as subjects. In order to participate in the present study, it was requested that subjects not exercise for at least 8 hours, eat for at least 4 hours, nor drink any fluids for at least 4 hours prior to testing. Subjects were also required to wear appropriate clothing for BodPod testing and follow specific instructions for each assessment tool whilst assessments were being conducted (Table 1). All subjects were emailed the list of required criteria at least 24 hours prior to testing.

Results

The dependent variables involve data collected from each participant, including BMI, BF%, and FFM% (Figure 1; Table 3). Data was dependent on age, height, weight, and whether the individual’s activity level was categorized as normal or athletic. Data was analyzed using both Excel and SPSS Software (Table 1, 2, 3, 4).

Discussion

Higher levels of BF% indicate greater amounts of adipose tissue storage, but hormones of the endocrine system influence where the adipose tissue is stored. Hormone deficiency inhibits proper endocrine function, contributing to increased BF% and raises the risk of obesity in men and women (Solomon and Bouloux, 2006). Individually, with greater amounts of FFM% tend to have higher VO2max values and better anaerobic capabilities. Therefore, individuals with higher FFM% often perform better than those with greater BF%.

In the females, the BodPod was shown to be a strong predictor of BF% measured by the other three forms of assessment with R²-values all above 0.774 (Table 4). The significant correlations between each form of assessment suggest that the BodPod may be the gold standard for measuring BF% (Collins et al., 1999). However, in the males, BodPod assessments showed no statistical significance with the BF% measured by any of the other forms of assessment. Therefore, the results for the males within this study call into question the accuracy and precision of these four tools. This discrepancy may be attributed to the fact that most of the male subjects were not categorized as athletes whereas women collect the most adipose tissue near both their hips and thighs.

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References


Bredella (2017), men tend to carry more lean mass compared to females and men tend to collect adipose tissue around their abdomen whereas women collect the most adipose tissue near both their hips and thighs.

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