Agreement Between Body Mass Index and Percent Body Fat in Resistance Trained Men and Women

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ABSTRACT

National health organizations report on the prevalence of obesity utilizing statistics based upon Body Mass Index (BMI), a noninvasive, anthropometric measurement used for weight classification. Though the limitations of the BMI formula are well known, it is still commonly used in clinical settings due to the ease of calculation using only weight and height (kg/m^2). Dual-Energy X-Ray Absorptiometry (DXA) is a criterion method for body composition estimation. **PURPOSE**: The purpose of this analysis was to assess the agreement between BMI classification and measured percent body fat (PBF) via DXA in a resistance-trained (RT) population. **METHODS**: DXA scans of resistance-trained male and female volunteers were included in this secondary analysis. Participants were divided into BMI classification and PBF levels as defined by the American College of Sports Medicine (ACSM). These categories were collapsed further into "obese" versus "not obese" cases according to BMI and then "obese" versus "not obese" cases according to PBF. Finally, agreement was measured using Chi-square goodness-of-fit. For analysis, BMI classification was used to determine the number of expected cases and PBF level was used to determine the number of observed cases. The analysis was repeated with categories collapsed into "overweight or obese" versus "not overweight or obese" cases for both BMI and PBF. **RESULTS**: Male (n = 237; age: 27.7 ± 10.7y; BMI: 29.6 ± 5.6; PBF: 20.9 ± 8.4%) and female (n=95; age: 25.2 ± 8.6y; BMI: 26.2 ± 5.6; PBF: 29.7 ± 8.3%) participants were distributed into collapsed BMI categories by sex and PBF categories by sex. Chi-square goodness-of-fit analysis revealed statistical significance between BMI and PBF in both obese versus not obese cases (males: $\chi2 = 138.7$, *p*<.001; females: $\chi2 = 22.2$, *p*<.001) and overweight or obese versus not overweight or obese cases (males: $\chi2 = 60$, *p*<.001; females: $\chi2 = 12.2$; *p*<.001). In males, BMI overestimated overweight and obese cases. Conversely, BMI underestimated overweight and obese cases in females. **CONCLUSION**: These data indicate that alternative methods for classification should be developed to accurately assess body composition of resistance-trained individuals. Moreover, because RT females classified in a normal weight category may be at risk for normal weight obesity, further emphasis should be placed upon increasing lean muscle mass in active females.