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Defining Overweight and Obesity by Percent Body Fat instead of Body Mass Index

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Abstract

Objective: Thresholds for overweight and obesity are currently defined by body mass index (BMI), a poor surrogate marker of actual adiposity (percent body fat, %BF). Practical modern technologies provide estimates of %BF but medical providers need outcome-based %BF thresholds to guide patients. This analysis determines %BF thresholds based on key obesity-related comorbidities, exhibited as metabolic syndrome (MetSyn). These limits were compared to existing BMI thresholds of overweight and obesity.

Design: Correlational analysis of data from cross sectional sampling of 16,918 adults (8,734 men and 8,184 women) from the US population, accessed by the National Health and Nutrition Examination Survey (NHANES) public use datasets.

Results: Individuals measured by BMI as overweight (BMI>25 kg/m²) and with obesity (BMI>30 kg/m²) included 5% and 35% of individuals with MetSyn, respectively. For men, there were no cases of MetSyn below 18%BF, %BF equivalence to "overweight" (i.e., 5% of MetSyn individuals) occurred at 25%BF, and "obesity" (i.e., 35% of MetSyn individuals) corresponded to 30%BF. For women, there were no cases of MetSyn below 30%BF, "overweight" occurred at 36%BF, and "obesity" corresponded to 42%BF. Comparison of BMI to %BF illustrates the wide range of variability in BMI prediction of %BF, highlighting the potential importance of using more direct measures of adiposity to manage obesity-related disease.

Conclusions: Practical methods of body composition estimation can now replace the indirect BMI assessment for obesity management, using threshold values provided from this study. Clinically relevant "overweight" can be defined as 25 and 36% BF for men and women, respectively, and "obesity" is defined as 30 and 42% BF for men and women.

Keywords: BMI; body fat; body mass index; metabolic syndrome.

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