

Predicting Percent Body Fat using Body Mass Index and Abdominal Circumference

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ABSTRACT

Assessing waist/ hip ratio is widely common to use since it does not require much skill and is vastly inexpensive. The understanding of how accurate the waist/ hip ratio technique, however, should be compared to more accepted practices in assessing percent body fat. PURPOSE: To determine if abdominal circumference (AC) predicts percent body fat (%BF) better than body mass index (BMI). METHODS: One hundred and fifty four subjects (age=26.3±5.1 yrs, height=168.5±9.6 cm, weight=80.4±22.09 kg) first had their height and weight measured with a Seca S-214 height rod (Hanover, MD) and a Detecto DR400C platform scale (Webb City, MO), with no shoes. Subjects %BF was then measured using a Lange skinfold caliper. All subjects were marked with a ballpoint pen using a flexible measuring tape, then a skinfold was grasped with the left thumb and forefinger and the thickness assessed with the caliper in the right hand. The measurement sites were made on the right side of the subject as follows: Male: chest, triceps, and subscapular. Female: triceps, suprailiac, and thigh. Subjects then had their AC measured using a flexible measuring tape around the abdomen at the level of the navel, which took less than one minute. Pearson's Product Moments correlations were used to establish the relationship between the predictor and criterion and Cronbach's alpha was used as an intraclass measure of reliability. Significance was set with Alpha ≤ .05. RESULTS: There was a significant relationship between BMI and %BF, $r_{(152)}=.48$, $p=.001$, $\alpha=.61$, as well as AC and %BF, $r_{(152)}=.51$, $p=.001$, $\alpha=.61$. The regression model was significant for BMI, $Y=.754(\text{BMI})+5.96$, $p=.001$, as well as for AC, $Y=.288(\text{AC})+.735$, $p=.001$. CONCLUSION: Since the relationship between each predictor was significant with the criterion, it can be plausible to use either as an estimate of %BF in this population. When using either of the predictors, however, they must be used with caution given that the relationships between the measures are no stronger than moderate.

