Poster presentation

Relationship of various body composition parameters used for predicting VO$_{2max}$

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Background

Forty-six male and twenty-eight female university students (n = 74), ages 18–32 (21.41 +/- 2.54) volunteered to participate in a study examining the relationship of various body parameters used for predicting aerobic power (VO$_{2max}$).

Methods

Participants performed a graded exercise treadmill test measuring VO$_{2max}$ as well as a 6-minute walk test within 1 week of each other. Height, weight, self-report of physical activity (PARS), body mass index (BMI), and estimated percent body fat (skinfold and bioelectrical impedance analysis) were also measured including the recording of participant demographics.

Results

Using multiple linear regression, a model was produced where significant predictors of VO$_{2max}$ ($p < 0.05$) included estimated body fat percentage from sum of three skinfolds ($p < .001$) and BMI ($p = .024$). The generalized equation ($R = .741$, $R^2 = .549$, $SEE = 7.10$) derived from the model to predict VO$_{2max}$ was: 72.32 + (-.949 × %fat from skinfolds) – (.392 × BMI). Variables excluded ($p > 0.05$) from the model included 6-minute walk test time, PARS, height, weight, gender, age, and percent body fat from bioelectrical impedance analysis.

Conclusion

It was concluded that that percent body fat and BMI are significant predictors of VO$_{2max}$. Although the relationship between VO$_{2max}$ and the other variables examined in this study were not significant, it may have been due to the homogeneity of these parameters (e.g., age and activity levels) in the participants and the lack of the 6-minute walk test to discriminate among fitness levels in university students. However, these results demonstrate the importance of the relationship between BMI and percent body fat (estimated from skinfolds) in predicting VO$_{2max}$ without maximal testing.