

[Letter to the Editor]

Body Mass Index and Percentage of Body Fat as Indicators for Obesity in an Adolescent Athletic Population: Why the Jackson-Pollock Formula?

Dear Dr Wojtys

With great interest, we read the article titled “Body Mass Index and Percentage of Body Fat as Indicators for Obesity in an Adolescent Athletic Population,” by William C. Etchison and colleagues.² This study has merit, and the accomplishment of such a big study—with participation of about 34 000 athletes over a period of 18 years in 2 states—is commendable. However, we would like to bring up some points that we feel could have been a worthwhile addition to this study.

Body mass index (BMI) has been used to determine risk of developing type 2 diabetes, hypertension, and cardiovascular diseases. In addition, BMI acts as an accurate tool for determining a healthy weight for the general population.⁴ However, it is a relatively poor predictor of body fat percentage, particularly in those who have a muscular body, such as professional athletes.⁹

To assess the body fat percentage in children and adolescents, different methods have been used by the authors. Skinfold thickness, BMI, ADP (air displacement plethysmography), BIA (bioimpedance analysis), HW (hydrostatic weighting), and DXA (dual X-ray absorptiometry) are some of these techniques. In this regard, comparing different techniques with the 4-compartment models (as the gold standard), DXA and ADP have been reported as more reliable techniques.^{3,7} Skinfold thickness measurement is also a common and easy-to-use technique, with its results having an acceptable correlation with DXA.¹ For estimation of body fat percentage using skin fold measurements, selection of the appropriate equation is critical. More than 15 researchers have developed formulas for calculation of body fat percentage in children and adolescents using their skinfold thicknesses. However, accuracy of most of the formulas was reported as poor at the individual level.⁶ Nevertheless, clinical studies suggest that to find a relative index of fatness of adolescents, the Slaughter et al formula could be used for both sexes and the Brook formula only for females.^{5,6,8}

Etchison et al² used the Jackson-Pollock equation for calculation of the body fat percentage of the adolescent athletes.

However, Valizadeh and associates⁸ reported underestimation of the body fat percentage of participants when it was calculated using the Jackson-Pollock equation. This point was achieved comparing the results of the Jackson-Pollock equation with output of the segmental multifrequency bioimpedance technique. It seems that this formula is not appropriate for children and adolescents, and in the Etchison et al² study, programming the body fat calculator with the Jackson-Pollock equation led to underestimation of the body fat percentage in the participants. We suggest that Etchison et al reanalyze their data using Slaughter formula and review whether there would be any difference in the results of the study.

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