Fat-free mass and bone mineral density of young soccer players: Proposal of equations based on anthropometric variables

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Background: The assessment of body composition may assist in optimizing competitive efficiency and monitoring the success of training regimes for young soccer players. The purpose of this study was to determine the predictors for Fat-Free Mass (FFM) and Bone Mineral Density (BMD) of young soccer players. Also, the goal was to propose regression equations to estimate FFM and BDM through anthropometric variables. Methods: One hundred and sixty-seven young soccer players ages 10.0 to 19.9 years old were studied. Weight, height, trunk-cephalic length, right arm circumference, diameter of the humerus, and length of the foot were assessed. FFM and BDM were determined by using dual X-ray absorptiometry (DXA). Maturity status using Peak Height Velocity (PHV) was calculated. Results: Maturity status, weight, and circumference of the relaxed arm positively related to the FFM (R 2 = 41-66%). Similarly, PHV, weight, diameter of the humerus, and length of the foot explained BDM in both groups of soccer players (goalkeepers and filed players) (R 2 = 45-82%). Six equations to predict FFM (R 2 = 62-69%) and six to predict BDM (R 2 = 69-90%) were created. Chronological age had a limited use for predicting FFM and BDM. Conclusion: Results suggested the use and application of the regression equations as a non-invasive alternative for everyday use in soccer clubs.

Bone mineral density

Equations

Fat-free mass

Soccer

Young people