Title

Fat-Free Mass Index for body composition analysis in pediatric sport: a cross-sectional study

Abstract

BacKGround: analyzing fat free mass (ffM) helps sport professionals during the prescription of sport training for children and adolescents in a sport initiation program. in this way, it is possible to determine fat mass (fM) (ffM subtracted from total body weight) and design interventions to increase ffM and reduce %f, making it possible to maximize performance in relation to the physical demands of sport. however, there is still no reliable anthropometric index to analyze ffM in this population. The aim the present study was to develop the fat-free Mass index (ffMi) for pediatrics of both sexes. MeThodS: cross-sectional study with a sample composed of 254 pediatrics (139 males [age: 13.0±2.3] and 115 females [age: 12.5±2.2]), from a sports initiation school. We divided the sample into the groups: 1) development (n.=169); and 2) cross-validation (n.=85). The body composition was analyzed by dual-energy X-ray absorptiometry (dXa), in addition we acquired anthropometric data (height, body weight and hip circumference) for the development of the ffMi – pediatric (ffMip). By means of linear regression we tested the predictive power of ffM using dXa as a reference method, then we developed ffMip and tested its reliability and validity in relation to dXa. reSulTS: ffMip consisted of: -16.679 + (0.615 × body mass (kg)) - (2.601 × sex) + (0.618 × age(years)) - (0.332 × hip(cm)) + (0.278 × stature(cm)), where for sex 0 = male and 1 = female. For the FFM analysis, FFMIp showed no significant difference from DXA (P>0.05). It also showed significant accuracy (Cb>0.960), precision (ρ>0.990) and agreement (CCC>0.960) for both groups (development and cross-validation). concluSionS: pediatric ffMi proposed by this study proved to be valid for the analysis of fat-free mass in pediatric athletes of sports initiation of both sexes.

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