
Title

Comparison of international height and BMI-for-age growth references and their correlation with adiposity in Brazilian schoolchildren

Abstract

This study verified the diagnostic accuracy of the nutritional status classified by the international height and BMI references of the World Health Organization (WHO) (WHO/2007), International Obesity Task Force (IOTF/2012) and MULT (2023). The data pool was composed by 22 737 subjects aged five to 16 years from the Santos and Porto Alegre surveys. A correlation matrix between the z-scores of the BMI references and the skinfold measurements was calculated through the Pearson correlation coefficient (r), and the subject's nutritional status was classified according to the international growth references. The accuracy for diagnosing obesity was performed separately by sex and using the 95th percentile of the triceps and subscapular skinfold sum, while Lin's concordance coefficient, Bland-Altman method and the Cohen's Kappa coefficient (Kappa) were used to verify the concordance and reliability among the BMI references. The correlation matrix showed a high positive correlation among the BMI z-scores ($r \geq 0.99$) and among the skinfold measurements ($r \geq 0.86$). The prevalence of stunting was higher when applying the MULT reference (3.4 %) compared with the WHO reference (2.3 %). The Bland-Altman plots showed the lowest critical difference (CD) between the height references of WHO and MULT (CD = 0.22). Among the BMI references, the WHO obesity percentile presented lower performance than MULT for boys, presenting a lower +LR value (WHO = 6.99/MULT 18 years = 10.99; 19 years = 8.99; 20 years = 8.09) for the same -LR values (0.04). Therefore, MULT reference holds promise as a valuable tool for diagnosing childhood obesity, particularly when considering sex differences. This enhances its suitability for assessing the nutritional

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