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Is obesity an emerging problem in Brazilian children and adolescents?

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Globally, childhood obesity is an emerging public health problem.[1] Elevated body mass index (BMI, kg/m²) in childhood is associated with 1) hyperlipidemia, insulin resistance, and hypertension[2]; and 2) adulthood obesity and cardiovascular disease (CVD).[3,4] In many developing countries, low birth weight, underweight, and stunting are still prevalent,[5,6] which might be associated with increased CVD risk in adulthood.[7] The dual burden of obesity and underweight create economic and public health challenges, especially in countries undergoing socioeconomic transition.
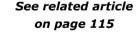
In this issue of Jornal de Pediatria, Silva et al.[10] compared the growth patterns of Brazilian children and adolescents with the Centers for Disease Control and Prevention (CDC)[11] and the World Health Organization (WHO)[12] growth charts. This cross-sectional study analyzed data involving 41,654 students (23,328 boys and 18,326 girls) aged 7-17 years. The data were collected from public and private schools located in 23 states across the five Brazilian regions (North, Northeast, Central West, Southeast, and South) in 2004 and 2005. Height and weight were measured by trained staff using calibrated equipment. Weight, height, and BMI were compared with corresponding age- and gender-specific CDC and WHO reference values using Student's *t* test. The study showed gender variation in height, weight, and BMI. Boys were taller at ages 7, 13-17 years; girls were taller at ages

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10-12 years; and girls had higher mean BMI at ages 10, 12-16 years (p ≤ 0.05). In almost all ages, Brazilian boys and girls had higher mean height and weight compared to corresponding CDC and WHO growth charts (p ≤ 0.05). The mean BMI was significantly lower than the 85th percentile of WHO growth charts at all ages (p ≤ 0.05); however, the gap increased with age such that the mean BMI of the Brazilians approached the 80th percentile in early childhood and reached the 50th percentile in late adolescence. On average, the Brazilian adolescents would appear leaner than the younger Brazilian children based on the WHO reference BMI charts.

The study by Silva et al. is based on a large and recent sample from different regions in Brazil, which allows for the generalizability of findings to Brazilian youths. The authors presented the mean and standard deviation of weight, height, and BMI by age and gender that provide useful comparative parameters. Unfortunately, the authors missed an opportunity to evaluate the prevalence of stunting, underweight, overweight and obesity in a large sample of Brazilian children and adolescents. Although they allude to an increasing prevalence of overweight in the discussion, they did not calculate the percentage of children and adolescents above the 85th BMI percentile. It would be useful to compute the 1) z scores of height-for-age, weight-for-age, and BMI-for-age; and 2) to estimate the prevalence of stunting, underweight, overweight, and obesity using the age-, gender-specific CDC and/or WHO growth charts.

The study has a few limitations that have been noted by the authors. This is school-based, cross-sectional study in which a non-probabilistic sampling method has been used to recruit children. As a consequence, 97% of participants were enrolled in urban schools (expected to be 84% in a nationally representative sample). Thus, the findings might be more relevant to the urban Brazilian population.

The Silva et al. study has significant public health implications. First, the use of international growth references to classify height, weight, and BMI status in Brazilian children and adolescents will broaden the comparability of the growth data.[10] Second, the study illustrated the need to stratify growth monitoring by age, gender and geographical region, and set a baseline for future tracking of secular trends. Third, the study emphasized the utility of growth monitoring for prioritizing public health interventions aimed at individual, familial, social, and environmental changes needed to promote optimal growth. National statistics on the prevalence of stunting, underweight, overweight, and obesity in Brazilian children will influence public health policies and answer the question whether obesity is an emerging problem in Brazilian children and adolescents.

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