

Tackling the Rising Tide: Understanding the Prevalence of Childhood Obesity in India

Weight gain in individuals, leading to overweight, adiposity, and obesity, is one of the most important drivers behind the rapid increase in the prevalence of noncommunicable diseases (NCDs). Globally, health systems face the growing economic burden of screening and managing this epidemic of NCDs and related complications. Despite obesity being classified as a disease in the International Classification of Disease-6 in 1948, it is still labeled as a risk factor in most global health systems. The World Health Organization (WHO) recognized obesity as a disease in 1997. However, it was only as recently as 2023, the European Commission recognized obesity as a disease rather than a risk factor. In India, obesity is still not considered a disease. A recent advocacy paper written by Indian endocrinologists urged that obesity is considered a disease in India and that it needed our immediate attention with regard to screening, effective management, and measures related to sustaining weight loss.^[1]

Obesity among children is even more alarming because of three factors. First, NCDs are traditionally considered adult diseases but find higher prevalence among children driven by childhood obesity. Second, the age at which regular screening for NCD should be undertaken in a population progressively decreases because we are going to find them in younger children. Both these increase the economic costs of providing health care to a population. Third, with an increase in childhood obesity, NCDs and related complications such as ischemic heart disease, chronic kidney disease, chronic liver disease, and obesity-driven malignancies would appear in younger, economically active contributing individuals, resulting in loss of productivity and stunting of economic growth.

SCREENING FOR CHILDHOOD OBESITY

Traditionally age and gender specific body mass index (BMI) cut offs are used to diagnose childhood obesity. Children above the 85th percentile are labelled overweight and those above the 95th percentile are labelled obese based on gender specific BMI data sets.^[2]

Multiple data sets are used in India to diagnose childhood obesity. The first WHO standards released in 1995 for older children were based on data collected in the United States. In 2006 a second data set for children below the age of 5 years was released. This data set included data from 8500 children from different ethnic backgrounds including India.^[3] Both these datasets were merged in the current WHO growth reference curves. The 2015 Indian Academy for Pediatric (IAP) BMI charts have been derived by backtracking for the lower adult BMI cut offs recommended for adult Indians

(overweight- 23kg/m² & obese-25kg/m²). Additionally, multiple prevalence studies in India have also utilized the International Obesity Taskforce (IOTF) data set and the American Centers for Disease control (CDC) age and sex specific data set.^[4,5]

PREVALENCE OF OVERWEIGHT AND OBESITY AMONG INDIAN CHILDREN

The latest World Obesity Atlas was published by the World Obesity Federation in March 2024 to coincide with World Obesity Day. The atlas estimates that as of 2020, there are 33 million children in India who are living with overweight and obesity. This works out to an overall prevalence of 9% of overweight and obesity among children below the age of 20 years. Overweight and obesity rates are projected to grow annually by 6.2% every year. In 15 years, by 2035, it is estimated that India will be home to 83 million children with overweight/obesity accounting for a prevalence rate of 24%. Although the overall prevalence figures appear lower than other countries in the atlas because of the sheer size of our population, almost 10% of children with high BMI are likely to be living in India.^[6]

The prevalence figures in the atlas are likely to be an underestimate if we look at results of published meta-analysis from India. It is important to remember that school surveys which are the most common tools undertaken in India to understand the prevalence of childhood obesity only estimate this among school-going children (5–19 years). For the estimation of prevalence of adiposity among preschool children (<5 years), population-based home surveys need to be undertaken.

Preschool children (<5 years)

The prevalence data are limited in this group. Most of the data come for the National Family Health Surveys (NFHS) and the National Nutritional Monitoring Bureau (NNMB) surveys. The latest NNMB survey report from 2017 suggested that 25% of children in India were still underweight.^[7] The prevalence of obesity in preschool children is low in India, with the data from a meta-analysis in 2012 suggesting it to be 1.5%–1.6%.^[8] A survey done in a semiurban town in South India suggested that 4.5% of preschool children are overweight and 1.4% have obesity.^[9] A recent paper which estimated the prevalence of overweight/obesity in preschool children using data obtained from the NFHS-2015 (*n* = 176,255) suggested that 2.6% of preschool children are overweight/obese.^[10] The last NFHS-2021 suggested that this has increased to 3.4%.^[11]

More detailed analysis of the data has not yet been done for preschool children.

School-going children and adolescents (5–19 years)

Data are easier to access among school-going children. However, most of these cross-sectional studies in India have been done in urban settings. An early large multicentric study done in over 38,000 children in five cities across India showed a prevalence of overweight and obesity of 18.5% and 5.3%, respectively, using the WHO BMI cutoffs. This suggested that in 2011, there were likely to be around 15 million overweight children in India.^[12]

A more recent meta-analysis was published last year, which included both preschool and school-going children (years 2003–2023), which involved data of 186,901 children (21 different studies) between the ages of 3 and 18 years. Pooled data from these 21 studies suggested an overall prevalence of obesity in childhood to be around 8.4% (confidence interval [CI] 95%) with a prevalence of overweight being around 12.4% (CI 95%).^[13] These rates are much higher than that published in the World Obesity Atlas, suggesting that the figures in the Atlas may be an underestimate.

In this issue of the journal, we publish another systematic review looking at the prevalence of overweight/obesity among school going children (5-18years). The analysis was limited to data collected from schools going children only. The authors limited themselves to articles published in English and from the year 2007 to 2022. The authors also excluded studies which only published data for a single gender. These and other shortcomings in methodology suggest that the study does not meet the criteria for a meta-analysis but is limited to a systematic review. The final review included 21 studies with 71,466 participants. The authors did not do a pooled analysis to give us an estimate of overall prevalence. However, the authors rightly noted the difficulties in pooling with differing criteria used for estimation of overweight/obesity in the selected studies. Among the 21 studies included in the systematic review, 8 used the WHO BMI criteria, 7 used the IOTF criteria, and the remaining studies used the either the IAP criteria, CDC criteria or diagnosed obesity using non-BMI criteria. Pooled estimates from different regions suggested that Eastern India had the highest prevalence of overweight and obesity with figures of 15.9 and 9.8% respectively. The lowest estimates were from Northeast India.^[14] These new figures and estimates also confirm the suspicion that childhood overweight and obesity may be underestimated by the World obesity atlas.

PREVALENCE OF NONCOMMUNICABLE DISEASES IN CHILDHOOD

The consequences of childhood obesity are profound and far-reaching, encompassing both immediate health effects and long-term implications. Obese children are at higher risk of developing chronic conditions such as type 2 diabetes, hypertension, cardiovascular diseases, and orthopedic

problems. Furthermore, obesity in childhood often persists into adulthood, leading to a higher likelihood of obesity-related complications later in life, including an increased risk of premature mortality.

The estimates of children with NCDs suggest that there are over 2.2 million children with hypertension attributable to adiposity in India. In addition, there are over 3.0 million and 1.1 million children living with lipid abnormalities and glucose intolerance related to being overweight/obese in India. These estimates are also from the world atlas of obesity.^[6]

THE WAY FORWARD

To tackle the prevalence of childhood obesity, a multifaceted approach is required, involving government, health-care professionals, educators, parents, and the food industry. This includes implementing nutrition education programs in schools, promoting breastfeeding and healthy eating practices from an early age, creating safe and accessible spaces for physical activity, and regulating the marketing of unhealthy foods to children.

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REFERENCES

1. Kalra S, Kapoor N, Verma M, Shaikh S, Das S, Jacob J, *et al.* Defining and diagnosing obesity in India: A call for advocacy and action. *J Obes* 2023;2023:4178121.
2. WHO. Obesity. Available from: https://www.who.int/health-topics/obesity#tab=tab_1. [Last accessed on 2024 Apr 24].
3. Butte NF, Garza C, de Onis M. Evaluation of the feasibility of international growth standards for school-aged children and adolescents. *J Nutr* 2007;137:153-7.
4. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: International survey. *BMJ* 2000;320:1240-3.
5. Kuczmarski RJ. CDC growth charts: United States. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2000. Available from: <https://www.cdc.gov/growthcharts>. [Last accessed on 2024 Apr 24].
6. World Obesity Atlas 2024. Available from: <https://www.worldobesity.org/resources/resource-library/world-obesity-atlas-2024>. [Last accessed on 2024 Apr 24].
7. National Nutrition Monitoring Bureau- Technical Report- No. 27 Obtained. Available from: [https://www.nin.res.in_downloads>NNMB%20Urban%20Nutrition%20Report%20-Brief%20%20%20report%20\(2\).pdf](https://www.nin.res.in_downloads>NNMB%20Urban%20Nutrition%20Report%20-Brief%20%20%20report%20(2).pdf). [Last accessed on 2024 Apr 24].
8. Gupta N, Goel K, Shah P, Misra A. Childhood obesity in developing countries: Epidemiology, determinants, and prevention. *Endocr Rev* 2012;33:48-70.
9. Kumar HN, Mohanan P, Kotian S, Sajjan BS, Kumar SG. Prevalence of overweight and obesity among preschool children in semi urban South India. *Indian Pediatr* 2008;45:497-9.
10. Saha J, Chouhan P, Ahmed F, Ghosh T, Mondal S, Shahid M, *et al.* Overweight/obesity prevalence among under-five children and risk factors in India: A cross-sectional study using the national family health

- survey (2015-2016). *Nutrients* 2022;14. [doi: 10.3390/nu14173621].
11. National Family Health Survey -5 (NFHS-5), 2019-2021- India Report. Available from: <https://dhsprogram.com/pubs/pdf/FR375/FR375.pdf>. [Last accessed on 2024 Apr 24].
 12. Misra A, Shah P, Goel K, Hazra DK, Gupta R, Seth P, *et al.* The high burden of obesity and abdominal obesity in urban Indian schoolchildren: A multicentric study of 38,296 children. *Ann Nutr Metab* 2011;58:203-11.
 13. Singh S, Awasthi S, Kapoor V, Mishra P: Childhood obesity in India: A two-decade meta-analysis of prevalence and socioeconomic correlates. *Clin Epidemiol Glob Health* 2023;23:101390.
 14. Sharma N, Sanjeevi RR, Balasubramanian K, Chahal A, Sharma A, Sidiq M, *et al.* A systematic review on prevalence of overweight and obesity among school children and adolescents in Indian population. *Indian J Endocrinol Metab* 2024;28:104-16.

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