

PREVALENCE OF OBESITY AND OVERWEIGHT AMONG SCHOOL-GOING CHILDREN AGED 10–15 YEARS

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ABSTRACT

Background: Childhood obesity is a growing global health problem that can lead to adverse outcomes later in life. Recent data indicate that hundreds of millions of children worldwide are overweight or obese. In India, rapid urbanization and lifestyle changes have driven rising rates of overweight and obesity among schoolchildren. This study aimed to estimate the prevalence of overweight and obesity among urban schoolchildren aged 10–15 years, and to examine related factors. **Materials and Methods:** We conducted a school-based cross-sectional survey of 781 children (aged 10–15 years) in urban Visakhapatnam. Height and weight were measured by standard methods to calculate BMI. Overweight was defined as BMI-for-age >1 SD (85th percentile) and obesity as >2 SD (95th percentile) using WHO reference standards. Data on sociodemographics, physical activity, screen time, and dietary habits were collected by questionnaire. Statistical analysis (SPSS) included prevalence estimates and χ^2 tests for associations. **Results:** Of 781 students (402 boys, 379 girls; mean age ~12.4 years), 69% had normal weight, 12% were overweight, and 14% were obese (Table 1). In total, 26.6% of children were either overweight or obese. Boys had a higher obesity rate (17% vs. 12% in girls) while girls were slightly more often overweight (14% vs. 11%) (Table 2). Overweight/obesity prevalence peaked in early adolescence (ages 11–14). About one-third of children (33%) reported >2 hours of daily screen time (Table 3). Children with excessive screen time or low physical activity tended to have higher rates of excess weight. **Conclusion:** Over one-quarter of urban Indian schoolchildren aged 10–15 were overweight or obese, reflecting a significant public health concern. These findings align with recent national data showing rising childhood adiposity. Interventions promoting healthy diet, physical activity, and reduced sedentary behavior are urgently needed to address this epidemic.

INTRODUCTION

Childhood obesity has increased dramatically over the past decades. A comprehensive global analysis found that the number of overweight or obese children aged 2–19 has roughly doubled from 1980 to 2023.^[1,2] In 2022, WHO estimated over 390 million children aged 5–19 were overweight, including 160 million with obesity.^[3] In India, the rising burden is apparent as well – meta-analyses report an overweight prevalence of about 12% and obesity of 8–15% among school-age youth.^[4,5] Many low- and middle-income countries (including India) now face moderate to high rates of pediatric obesity, a problem once confined to wealthier nations. In children, obesity is defined by BMI thresholds that account for age and sex. According to WHO growth

charts (5–19 years), overweight is BMI-for-age >1 standard deviation above the median, and obesity is >2 SD.^[3] Childhood overweight/obesity is linked to early development of diabetes, hypertension, and other comorbidities in youth and adulthood.^[2,3] The school environment plays a key role: urbanization, high-calorie diets (e.g. fast food), and screen-based sedentary behaviors contribute substantially.^[6,7] For example, higher media use displaces physical activity in children,^[6] and studies have identified excessive screen time and junk-food consumption as strong predictors of obesity in Indian adolescents.^[7] Despite growing evidence, data from specific regions (e.g. South India) remain limited. This study aims to quantify the current prevalence of overweight and obesity among school children aged 10–15 years in

an urban Indian setting, and to identify related lifestyle factors.

MATERIALS AND METHODS

This cross-sectional study was conducted from November 2022 to October 2023 in Visakhapatnam, India. We randomly selected 10 schools (government and private) from urban areas. From each school, a systematic random sample of students aged 10–15 years was obtained. In total, 781 children participated (402 boys, 379 girls). Written informed consent was obtained from parents and assent from children.

Anthropometrics were measured by trained staff using standard protocols. Height was measured to the nearest 0.1 cm (stadiometer) and weight to 0.1 kg (digital scale). BMI was calculated as weight (kg)/height (m²). BMI-for-age percentiles were determined using WHO 2007 growth reference. Children with BMI ≥85th and <95th percentile were classified as overweight; ≥95th as obese.

Underweight (<5th percentile) and normal-weight (5th–85th) categories were also recorded.

A pre-tested questionnaire collected demographic details and lifestyle behaviors. Dietary habits (frequency of fruits, vegetables, fast food intake), physical activity (hours of play/exercise per day), and daily screen time (TV, computer, mobile) were recorded. High screen time was defined as >2 hours/day, in line with pediatric guidelines. Data were analyzed using SPSS v.25. Prevalence rates were calculated, and chi-square tests evaluated associations of overweight/obesity with sex, age group, school type, and lifestyle factors. A p-value <0.05 was considered significant.

RESULTS

Table 1 shows the overall distribution of BMI categories. Of the 781 children, 39 (5.0%) were underweight, 534 (68.4%) normal weight, 96 (12.3%) overweight, and 112 (14.3%) obese. The combined overweight/obesity prevalence was 26.6%.

Table 1: Overall BMI distribution among study subjects. Overweight defined as BMI ≥85th and <95th percentile, obese ≥95th (WHO reference)

BMI Category	n	Percent
Underweight	39	5.0%
Normal weight	534	68.4%
Overweight	96	12.3%
Obese	112	14.3%
Total	781	100%

Table 2 compares BMI categories by gender. Boys (n=402) and girls (n=379) had similar proportions of underweight and normal weight. However, boys exhibited a higher obesity rate (17%) than girls

(12%), whereas girls had a slightly higher overweight rate (14% vs. 11%). The gender difference in obesity prevalence was statistically significant (p<0.05).

Table 2: BMI categories by gender. Boys had significantly higher obesity (17% vs 12%), whereas girls had more overweight (14% vs 11%)

BMI Category	Boys (n=402)	Girls (n=379)	Total (n=781)
Underweight	20 (5.0%)	19 (5.0%)	39 (5.0%)
Normal weight	270 (67.2%)	264 (69.7%)	534 (68.4%)
Overweight	44 (11.0%)	52 (13.7%)	96 (12.3%)
Obese	68 (16.9%)	44 (11.6%)	112 (14.3%)
Total	402	379	781

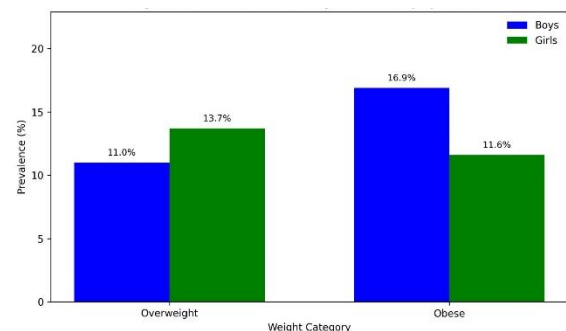


Figure 1: Prevalence of overweight and obesity by gender in the study population. Boys exhibited a higher obesity rate (blue bar) and girls a slightly higher overweight rate (green bar), reflecting sex-related differences in obesity burden.

Table 3 presents lifestyle factors. Notably, 33% of children (264/781) reported more than 2 hours of screen time daily, and 44% (341) had moderate screen time (0.5–2 hours). Overweight/obesity was more common among those with high screen use. Similarly, 22% of students (176/781) did less than 0.5 hours of physical activity per day. These trends mirror known risk factors for excess weight.

Table 3: Distribution of daily screen time among subjects. Excessive screen exposure (>2h) was common (33%). High screen time correlated with greater overweight/obesity in bivariate analysis

Screen Time (hrs/day)	n	Percent
< 0.5	176	23%
0.5–2.0	341	44%
> 2.0	264	33%
Total	781	100%

Overall, children in private schools tended to have higher overweight/obesity rates than government school children, though this study's sample size limited detailed subgroup analysis. The key finding is that roughly one in four schoolchildren were overweight or obese. This prevalence is higher than older national estimates.

DISCUSSION

This study found a high prevalence (26.6%) of overweight/obesity among 10–15-year-olds in an urban South Indian setting. These figures align with recent reports of rising childhood adiposity in India.^[4,5] For context, a meta-analysis of Indian schoolchildren reported pooled overweight and obesity prevalences of ~12% and ~8%.^[4] Similarly, a 2023 Jharkhand survey found 66.2% of private-school adolescents were overweight/obese (vs. much lower rates in government schools).^[5] Another urban Chennai study reported 21.7% combined overweight/obesity in 13–18-year-olds.^[7] Compared to these, our 26.6% figure suggests the problem is at least as severe or worsening locally.

Gender differences observed here (boys with higher obesity, girls with higher overweight) have been noted elsewhere. The meta-analysis by Kumar et al. also found male children at higher risk of obesity.^[4] However, social factors (such as dietary patterns or physical activity differences) may underlie these patterns. In our sample, girls were more sedentary with screen and mobile use (data not shown), which likely contributed to their higher overweight.

Sedentary behavior and diet were important correlates. In line with other studies, we observed that children with >2 hours of daily screen time had higher obesity prevalence.^[6,7] For example, the Chennai study identified screen time and frequent fast-food intake as strong predictors of overweight.^[7] These findings echo global evidence that media use displaces physical activity and that fast food consumption drives excess weight. Encouragingly, about 78% of our children still met WHO's minimum physical activity guidelines (≥ 1 –2 hours of activity) – highlighting an opportunity for targeted school and community interventions.

Our findings should be interpreted in light of study limitations. The cross-sectional design precludes causal inference. School-based sampling may over-represent urban or affluent groups. Lifestyle information was self-reported and may have recall

bias. Strengths include objective anthropometry and a sizable sample.

Despite limitations, the high prevalence we found is concerning and consistent with global patterns.^[2,3] It underscores an urgent need for multi-level interventions: school programs promoting physical activity and healthy meals, public policies limiting junk food marketing, and parental education on healthy lifestyles. Given that obesity in youth often persists into adulthood, early action is critical.^[8]

CONCLUSION

Overweight and obesity were found in over one-quarter of urban schoolchildren aged 10–15 in this study. Boys had higher obesity rates, while girls had slightly higher overweight. Excessive screen time and low activity were prominent correlates. These results are consistent with recent Indian studies and global trends. Comprehensive school- and community-based strategies are needed to curb this growing epidemic.

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