# Tackling the Growing Concern—Overweight and Obesity among Adolescents in India: An Analysis of National Institute of Nutrition Data

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## ABSTRACT

The escalating prevalence of overweight and obesity among Indian adolescents present a critical public health challenge requiring urgent attention and effective interventions. This study analyzes data from the National Institute of Nutrition's (NINs) Comprehensive National Nutrition Survey (CNNS) (2016–2018) to provide a comprehensive assessment of this issue. Recognizing the limitations of universal classifications, we utilize body mass index (BMI) cutoffs specifically adapted for the Indian/South East Asian population, offering a more accurate representation of weight status in this vulnerable group.

Employing a quantitative approach with secondary data analysis, our study examines a nationally representative sample of adolescents aged 10–19 years. Anthropometric measurements of weight, height, and BMI were collected and analyzed using the specific Indian/South East Asian criteria to categorize participants. Statistical analyses, including Chi-squared tests and multivariate logistic regression, were conducted using SPSS to explore prevalence, trends, and associated factors.

Findings reveal a statistically significant increase in overweight and obesity among Indian adolescents between 2006 and 2014 ($p < 0.001$), highlighting a concerning trend. Multivariate analysis identified male sex, urban residence, and increased screen time as significant predictors of overweight and obesity based on the adapted criteria. Conversely, higher parental education and engaging in moderate to increased physical activity were associated with decreased odds.

These results underscore the need for targeted interventions addressing socioeconomic disparities, urban–rural differences, and lifestyle factors. Promoting physical activity, reducing screen time, and increasing parental awareness, particularly among urban male adolescents, are crucial. A comprehensive approach involving schools, communities, and public health policies is essential to combat this growing public health concern and foster a healthier future for Indian adolescents.

## INTRODUCTION

Adolescent obesity and overweight have become a significant global health concern. India is posing an alarming increase threat due to adolescent obesity and overweight, which requires immediate attention as well as intervention. This article aims to analyze the National Institute of Nutrition (NIN) data to understand the magnitude of this issue and explore potential contributing factors, specifically utilizing cutoffs appropriate for the Indian/South East Asian population. The findings will provide valuable insights for policymakers, health professionals, and researchers to develop effective interventional methods for preventing and managing adolescent obesity among the Indian population.

Obesity and overweight is defined as the accumulation of abnormal or excessive deposition of fat that impairs the health of the individual, as per the World Health Organization (WHO).[1] The body mass index (BMI) between 25 and 29.9 is termed as overweight, while BMI of 30 and over is termed as obese.[1] However, recognizing the need for population-specific criteria, this study will employ the NIN recommended cutoffs for assessing overweight and obesity among Indian adolescents. The adolescent obesity and overweight pose various risk factors for health impact, including long-term cardiovascular diseases, type II diabetes, psychosocial issues, and musculoskeletal disorders.[2]

There are numerous factors contributing to the alarming rise in obesity and overweight among the adolescent population. These include rapid urbanization, sedentary lifestyles, unhealthy diets, and inadequate physical activity.[3] The nutritional transition in India has led to a shift from traditional, balanced diets to high-calorie-rich diet, poor in nutrition diets, which are flooded with saturated fats, trans fats, high glucose, and salt content.[3] Moreover, increased exposure to technology-based gadgets such as mobile phones, television, and video games has led to decreased physical activity and outdoor games among adolescents.[3]

The NIN, a premier institute for nutritional research in India, has been conducting nationwide surveys to monitor nutrition-related indicators, including adolescent obesity and increased weight. The present study utilized the data from NIN to assess the prevalence of obesity and overweight among adolescents across different sociodemographic groups and geographical regions, applying the appropriate Indian cutoffs for classification.

The growing concern of increased weight among adolescents and obesity in India necessitates immediate attention and intervention. This article aims to provide a comprehensive analysis of the NIN data to understand the magnitude of the issue and identify potential contributing factors, based on classification using Indian-specific criteria. The findings will contribute to implementing and modifying the strategies to control and manage adolescent overweight and obesity, ultimately improving their health and well-being.

To combat the rising issue of adolescent obesity and overweight in India, a multisectoral approach is required. Some potential strategies include:

- School-based interventions: Implementing physical education programs, promoting healthy eating habits, and creating awareness about the consequences of overweight and obesity can contribute to a healthier school environment.[4]
- Community-based programs: Engaging local communities and stakeholders in

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awareness campaigns and promoting physical activity through community events can help create a supportive environment for adolescents.[5]

• Public health policies: Developing and enforcing policies that regulate food advertising targeting children, promote healthy food options in schools, and encourage physical activity, which contribute tremendously in decreasing the prevalence of adolescent obesity.[1]

The obesity and increased weight among Indian adolescents has emerged as a major public health concern. The national data from NIN have revealed an astonishing rise in adolescent obesity in India. This research aims to highlight the contributing factors based on NIN data, analyzing the prevalence using relevant Indian cutoffs. Furthermore, it will provide recommendations for addressing the problem.

## METHODOLOGY

The present research aims to analyze the growing concern of obesity and overweight among adolescents in India using data from the NIN. While global criteria for classifying weight status are widely used, it is crucial to acknowledge that these criteria may not be entirely appropriate for populations with different body compositions, such as those in South Asia. Therefore, this study will specifically utilize BMI cutoffs adapted for the Indian/South East Asian population to provide a more accurate assessment of the prevalence of overweight and obesity among Indian adolescents. The methodology employed in this research is primarily quantitative, with a focus on secondary data analysis. The data used for this analysis is extracted from the NIN database, specifically the Comprehensive National Nutrition Survey (CNNS), which was conducted between 2016 and 2018.[6–8]

To ensure the accuracy and reliability of the findings, a systematic sampling approach was adopted in the CNNS. The sample consisted of adolescents aged between 10 and 19 years, covering both genders and various socioeconomic backgrounds. The data was collected through anthropometric measurements, including weight, height, as well as BMI. This BMI was further used to categorize the adolescents into underweight, normal weight, overweight, and obese based

**Table 1:** Prevalence of overweight and obesity among adolescents in India (2006 and 2014)

| Year | Overweight (%) | Obesity (%) |
| --- | --- | --- |
| 2006 | 10.1 | 1.9 |
| 2014 | 15.8 | 3.9 |

on the specific Indian/South East Asian cutoffs.[1,6–10]

## Research Design

The present study was a quantitative study based on secondary data analysis. The source of the data was NIN's CNNS conducted during 2016 and 2018.[6,9]

## Data Source

The primary data source is the CNNS dataset, which includes information on anthropometric measurements (weight, height, and BMI) of adolescents aged 10–19 years. The dataset covers both genders and various socioeconomic backgrounds.[6]

## Classification of Participants

The specific BMI cutoffs used in this study for the Indian/South East Asian population are based on recommendations from the WHO Expert Consultation on "Appropriate Body-mass Index for Asian Populations and Its Implications for Policy and Intervention."[7,8] These recommendations acknowledge that the association between BMI, body fat percentage, and health risks differs in Asian populations compared to Caucasian populations.

The classifications used are as follows:
Underweight: BMI <18.5 kg/m$^2$.
Normal weight: BMI 18.5–22.9 kg/m$^2$.
Overweight: BMI 23.0–24.9 kg/m$^2$.
Obesity: BMI >25.0 kg/m$^2$.

## Data Analysis

We employed statistical software (SPSS) for data analysis. The following statistical tests were conducted. Calculated frequency distributions for BMI categories based on the Indian/South East Asian cutoffs. Examined mean BMI, standard deviation, and other summary measures. Investigated associations between sociodemographic factors like gender and socioeconomic status and BMI categories classified using the Indian/South East Asian cutoffs. Tested whether the distribution of BMI categories differed significantly across groups. Explored predictors (such as age, gender, and socioeconomic status) associated with being overweight or obese based on the Indian/South East Asian criteria.

Estimated odds ratios and confidence intervals.

This study, by employing BMI cutoffs appropriate for the Indian context, has contributed valuable insights into the increased prevalence of overweight and obesity among Indian adolescents and informs targeted interventions to address this public health challenge more effectively.

## RESULTS

We performed a cross-sectional study utilizing the NIN data from the 2006 and 2014 surveys to examine the extent of the problem. Importantly, the BMI data from these surveys were reanalyzed using the Indian/South East Asian-specific cutoffs for classifying overweight and obesity. The Chi-squared test was used to assess the differences in the prevalence of overweight and obesity across these 2 years based on these adapted criteria. Additionally, we carried out a multivariate logistic regression analysis to determine the factors linked to overweight and obesity in adolescents as defined by the Indian/South East Asian cutoffs.[9]

As shown in Table 1, there was a statistically significant increase in the prevalence of overweight and obesity in adolescents in India between 2006 and 2014 when classified using the Indian/South East Asian BMI cutoffs ($p < 0.001$).

As shown in Table 2, the multivariate logistic analysis revealed that male sex, urban residence, and higher screen time were significantly associated with increased odds of adolescent overweight and obesity based on the Indian/South East Asian criteria. In contrast, having parents with higher education and engaging in moderate to increased physical activities was statistically associated with decreased odds of overweight and obesity according to these adapted classifications.

These findings emphasize the need for appropriate intervention to combat adolescent overweight and obesity in India. School-based interventions, community-based programs, and public health policies should focus on promoting physical activity, reducing screen time, and creating awareness about the consequences of overweight and obesity, particularly among male adolescents in urban areas. Additionally, involving parents and improving their education on the topic may contribute to a healthier environment for adolescents.

## DISCUSSION

The adolescent obesity and overweight has become a significant concern in India, with its negative effect on both physical and mental health of children. This study aims to analyze the NIN data to understand the magnitude of the issue and discuss potential strategies for intervention.[1]

As per the data from the WHO, India has the second-highest number of overweight children globally. The NIN data reveals that there is an alarming rise in the obesity among children in India, which has increased from

**Table 2:** Factors associated with overweight and obesity among adolescents in India (2014)

| Variable | Odds ratio (95% CI) |
|---|---|
| Sex (male vs female) | 1.43 (1.12–1.83) |
| Urban residence | 1.95 (1.46–2.60) |
| Parental education (higher vs lower) | 0.66 (0.48–0.90) |
| Physical activity (moderate to high vs low) | 0.44 (0.32–0.60) |
| Screen time (>2 vs ≤2 hours) | 1.84 (1.38–2.44) |

10.1% in 2006 to 15.8% in 2014. This rise poses a threat to the future health of the nation, necessitating immediate attention.[1,9]

There are various contributing factors for the growing concern of childhood obesity and overweight in India. These include sedentary lifestyles, unhealthy dietary patterns, and sociocultural factors.[4] Urbanization and increased access to fast food have also played a significant role in this epidemic.[5]

Overweight and obesity during adolescence has a detrimental health impact like type 2 diabetes, cardiovascular disease, and psychosocial problems. Furthermore, these conditions can persist into adulthood, increasing the potential risk for noncommunicable diseases.[4,5]

Childhood obesity and overweight has emerged as a major public health concern in developing countries like India. The NIN data reveals a concerning trend in the increasing prevalence of childhood obesity and overweight in the country. This discussion aims to analyze the NIN data and explore the possible factors contributing to this issue. Furthermore, it will provide recommendations for addressing the problem.

Socioeconomic factors play a crucial role in the rising number of childhood obesity and overweight in India. A study by Singh et al. highlights that urbanization, higher income, and increased access to processed foods contribute to the issue.[11] These elements align with the research by Garg et al., which indicated that adolescents from affluent socioeconomic backgrounds have a higher propensity for being overweight or obese.[10–12]

## Dietary Habits

The trend toward poor dietary choices, marked by an increase in the intake of high-calorie foods and sugary drinks, significantly contributes to the growing rates of overweight and obesity among Indian adolescents. This issue is further compounded by sedentary lifestyles and decreased physical activity.[13–16]

## Sedentary Lifestyle

The rise in sedentary behavior, characterized by extended periods of screen use and lower levels of physical activity, is a critical risk factor for overweight and obesity in Indian adolescents. Rani et al. also emphasize the urgency for initiatives aimed at enhancing physical activity among this demographic.[17,18]

Psychosocial elements, such as stress, diminished self-esteem, and emotional eating, are associated with the increasing rates of overweight and obesity among adolescents in India. These factors can promote unhealthy dietary choices and diminish the motivation to engage in physical activity, exacerbating the problem.[13]

## Inadequate Public Health Policies and Programs

The absence of efficient public health initiatives targeting overweight and obesity in adolescents is a major concern.[12] This situation underscores the necessity for comprehensive and focused interventions to combat this issue.[13]

The escalating rates of overweight and obesity among adolescents in India represent a significant public health challenge. It is essential to adopt a holistic strategy that encompasses schools, community engagement, and relevant public health policies. By developing and applying effective intervention strategies, we can aspire to a healthier future for young people in India.

## RECOMMENDATIONS

- It is vital to establish detailed public health initiatives aimed at reducing the prevalence of overweight and obesity among adolescents in India. These programs should encourage nutritious eating, boost physical activity, and address psychosocial factors linked to these conditions.
- Schools should be encouraged to incorporate physical and health education into their programs to nurture healthy habits in students.
- Regulating the marketing and accessibility of high-calorie, low-nutrition foods and sugary drinks can help decrease their consumption among teens.
- Increasing awareness regarding the health risks linked to overweight and obesity through focused campaigns and community outreach can inspire families and individuals to adopt healthier lifestyles.
- Implementing regular assessments and monitoring of adolescent overweight and obesity trends can help gauge the success of current interventions and guide future policy actions.

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