SHORT ARTICLE

Burden of overweight and obesity among children studying in schools of Western Rajasthan

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ABSTRACT

Background: Obesity in children has become a public health concern worldwide with a significant rise in recent years. **Aim & Objective**: This study aimed to estimate the occurrence of overweight and obesity in adolescents studying in school and to determine the risk factors for obesity as well as overweight in this population. **Settings & Design**: This cross-sectional research was carried out among adolescent children of age group 12-15 years from Jodhpur's rural and urban schools. **Methods & Material:** The present study included 1864 school children. A well-structured questionnaire was used to gather data, and the researchers measured weight and height with the help of calibrated tools. Index for Body Mass (BMI) and Z-scores were calculated, and the World Health Organization (WHO) standardized gender-specific growth chart was used to classify children as being overweight and obese. **Statistical analysis used**: The statistical evaluation was conducted utilising SPSS version 23.0. Chi-square analyses were applied to analyse the relationship of independent variables with overweight/obesity status. Variables showing statistical significance at a 5% level were further analysed using multiple logistic regression. **Results:** It was discovered that the rate of overweight and obesity among Jodhpur schoolchildren was 23.2%, with 22.9% classified as overweight and 0.3% as obese. The analysis revealed that children attending urban and public schools exhibited higher rates of obesity and overweight compared to those in rural and private schools. **Conclusions:** The study highlights a considerable burden of overweight among children enrolled in schools of Jodhpur, warranting the implementation of sustainable intervention aimed at encouraging physical exercise and a balanced diet.

INTRODUCTION

Childhood obesity is a public health concern worldwide with a significant rise in recent years. Approximately 10% of school-aged children worldwide are obese or overweight.(1) The burden of obesity has increased more than ten times over the past

40 years, reaching 124 million children, with an additional 216 million classified as overweight(2). In India, 3.6% to 11.7% of children are obese or overweight, and it is anticipated that by 2030, India will have over 27 million children who are obese, accounting for a substantial proportion of childhood obesity in the South-East Asia region and globally(3).

This trend is concerning, especially for low and middle-income countries like India, as healthcare systems are ill-equipped to manage and treat obesity effectively(4). Various genetic, behavioural, and environmental factors contribute to childhood obesity, but disrupted energy balance due to nutrition transitions and sedentary lifestyles play a significant role(5).

Childhood obesity raises the risk of multiple non-communicable illnesses, such as asthma, cognitive impairment, sleep disorders, diabetes, hypertension, heart diseases, cancers, respiratory diseases, and reproductive problems(6). It also impacts the mental health and well-being of children, as they face stigma, bullying, and barriers to educational attainment(3).

The best approach to tackle this problem is through prevention programs focusing on healthy nutrition practices and increased physical activity. To plan effective interventions, it is crucial to understand the magnitude of obesity in school children which was the main aim of the present study. To determine the prevalence of obesity and overweight among adolescents enrolled in school. To identify the risk factors for overweight as well as obesity in this age group.

MATERIAL & METHODS

A cross-sectional research was carried out among 1864 adolescents in rural and urban areas of Jodhpur for two months. Ethical permission was obtained from the Institutional Ethics Committee of AIIMS Jodhpur. Participants included 12 to 14-year-old school children from public and private schools. Thirty-one schools were randomly selected, and permission was obtained from the respective authorities. All present students in the target age group were included in the study, while absent students were excluded. Parental informed consent and participants' assent were obtained before data collection. A structured questionnaire was used to collect sociodemographic information.

Anthropometric data was collected by researchers using standardized equipment and techniques. Weight was measured with the help of a calibrated digital weighing scale with students standing barefoot. Height was measured with the help of a calibrated digital stadiometer. The formula used for calculating Body Mass Index (BMI) was BMI = Weight (kg) / Height^2 (m^2). The formula z = (Calculated BMI - Median BMI of same age group) / Standard deviation was also used to calculate Z-scores. WHO 2007 Standard Age and Sex Specific Growth Reference Charts were utilised to categorize children as overweight or obese. Obesity is defined as BMI-for-age > +2 SD above the reference median, and overweight as BMI-for-age > +1 SD.

A statistical analysis was performed with SPSS 23.0. Sociodemographic variables and BMI categories were reported as percentages and frequencies. To examine the relationship between independent variables and the status of overweight or obesity, chi-square tests were employed. Variables showing statistical significance at a 5% level were further analysed using multiple logistic regression. Calculating adjusted odds ratios with 95% confidence intervals, a p-value of less than 0.05 was deemed significant.

RESULTS

The study at hand was a component of another bigger study aiming to estimate the prevalence of asthma and sleep-related breathing disorders in school-going children in Jodhpur. The study participants' mean age was 13.35 ± 0.54 years. It was discovered that 23.2% of Jodhpur school children were overweight or obese (overweight: 22.9%, obese: 0.3%). Male participants slightly outnumbered females, accounting for 55.7% of the sample. The majority of respondents were from urban areas.

The association between sociodemographic variables and overweight/obesity status was analysed. On univariate analysis, significant

associations were found between obesity status and the residence area and school type. Compared to children from rural areas and private schools, children from urban areas and public schools had a higher prevalence of obesity. However, there was a lack of association found between being overweight or obese and having asthma or breathing disorders related to sleep. Multiple logistic regression analysis revealed that as compared to students attending private schools, children attending public schools had 1.48 times higher odds of being overweight and obese.. Additionally, children from urban areas had 3.6 times greater odds of being overweight and obese.

DISCUSSION

The results of the study showed that overweight children were more prevalent in public schools and urban areas**.** Gender, asthma status, and sleep-disordered breathing disorders were not significantly associated with obesity in the study participants. The prevalence of overweight in adolescents enrolled in school was alarmingly high at 22.9%. Previous studies conducted in different cities of India have reported varying prevalence rates of overweight, ranging from 11.1% to 35.8%.(7,8)

Our study findings are consistent with a retrospective cross-sectional study conducted in Tamil Nadu, which reported a 20% prevalence of overweight in children aged 5-18 years.(9)Other studies have reported lower prevalence rates, such as 15.6% in Uttarakhand and 11% in Hyderabad(10,11). Factors contributing to the increasing prevalence of overweight and obesity include sedentary lifestyles, consumption of processed foods high in fats and sugar, easy accessibility to calorie-dense foods, addiction to gadgets, and lack of physical activity.

Using WHO age-standardized growth charts, our study found a low prevalence of obesity in children, with only 0.3% classified as obese in both urban and rural schools of Jodhpur. This is lower than the reported prevalence rates in other studies, which range from 3.3% to 15.6%(9,11). This indicates that the magnitude

of the obesity problem in this population is small, making it feasible to implement effective school or community-based interventions. In our study, we did not find any statistically significant differences in the prevalence of obesity and overweight between boys and girls, highlighting the importance of promoting a healthy lifestyle for both genders. Consistent with previous research(10), our research found that the prevalence of overweight and obesity was higher in urban areas than in rural ones. Rapid urbanization, sedentary lifestyles, easy access to unhealthy food, internet addiction, and limited open spaces for outdoor activities contribute to the higher prevalence in urban areas. In terms of school type, public school children had higher rates of obesity and overweight compared to private schools. Private schools often implement programs promoting healthy eating habits and restrict junk food, which may contribute to lower rates of obesity among their students. Similar interventions can be implemented in public schools, potentially utilizing the platform of the mid-day meal program.

While previous studies(12,13) have shown a significant association between obesity and asthma or sleep-related breathing disorders, our study did not find such an association. The low prevalence of obesity in our study population (0.3%) may explain the lack of significant associations.

CONCLUSION

Overall, the results indicate that overweight and obesity are significantly more common among Jodhpur schoolchildren, with higher rates observed in urban areas and public schools.

RECOMMENDATION

Schools play a crucial role in promoting health-related information and behaviour change among students, their families, and the community. Parents and teachers should serve as role models by adopting healthy behaviours themselves and should encourage the same for children.

LIMITATION OF THE STUDY

A constraint of our research was the absence of data regarding eating patterns and physical activity, which could have provided more insights into the aetiology and dynamics of the problem. Future studies should incorporate these additional factors for a comprehensive understanding.

AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/ AI assisted technologies in the writing process.

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