



PREVALENCE AND METABOLIC PROFILE OF CHILDHOOD OBESITY AMONG SCHOOL-GOING CHILDREN NEAR RAIPUR.

Paediatrics

**Dr. Gajanan
Haribhau Yelme**

Assistant Professor, RIMS Raipur.

**Dr. Thandaram
Patel**

Assistant Professor, RIMS Raipur.

Dr. Anil Chouhan

Assistant Professor, RIMS Raipur.

**Dr. Chittaranjan
Naik***

Associate Professor, RIMS Raipur. *Corresponding Author

ABSTRACT

Background: Childhood obesity is an emerging public-health concern in India and is associated with early onset of metabolic abnormalities. The present study was conducted to determine the prevalence of obesity and assess its metabolic complications among school-going children in rural areas near Raipur. **Objectives:** 1. To estimate the prevalence of overweight and obesity in children aged 6–15 years. 2. To evaluate the association of obesity with metabolic parameters including blood pressure, fasting blood glucose, and lipid profile. **Methods:** A cross-sectional study was conducted among 400 school-going children from Godhi village and nearby schools within the RIMS Hospital field practice area over one year. Anthropometric measurements (height, weight, waist circumference) were recorded, and BMI was calculated using WHO growth-chart percentiles. Children classified as overweight or obese underwent metabolic assessment (fasting glucose, lipid profile, and blood pressure measurement). Data were analyzed using descriptive statistics and correlation analysis. **Results:** The prevalence of overweight was 11% and obesity 7% among the studied population. Obese children showed a statistically significant higher mean fasting blood glucose and serum triglyceride levels compared to normal-weight peers ($p < 0.05$). HDL cholesterol levels were lower, and systolic blood pressure was elevated in a subset of obese children. Overall metabolic abnormalities were consistent with previously reported Indian data. **Conclusion:** The study highlights that even in semi-rural settings near Raipur, obesity and related metabolic complications are emerging health issues among school-going children. Early screening and lifestyle modification programs in schools are essential to prevent long-term cardiovascular risk.

KEYWORDS

Childhood obesity, metabolic syndrome, BMI, lipid profile, school-going children, Raipur

INTRODUCTION

Childhood obesity has become a global epidemic, transcending urban boundaries and increasingly affecting children in semi-urban and rural India. It predisposes individuals to a spectrum of metabolic disorders including insulin resistance, dyslipidemia, hypertension, and early atherosclerosis.

In India, the double burden of undernutrition and overnutrition coexists, particularly among school-aged children, reflecting changing dietary and lifestyle patterns. The present study aimed to determine the prevalence of obesity and assess its metabolic complications among school-going children in villages near RIMS Hospital, Raipur.

MATERIALS AND METHODS

Study Design: Cross-sectional, observational study.

Study Period: January 2024 – December 2024.

Study Setting: Government and private schools located in Godhi village and surrounding areas near RIMS Hospital, Raipur.

Sample Size: 400 children aged 6–15 years.

Sampling Technique: Stratified random sampling ensuring equal representation from different age groups and both genders.

Data Collection:

- Anthropometric parameters (height, weight, waist circumference) were measured using standard protocols.
- BMI was calculated and categorized as per WHO age- and sex-specific percentiles: Normal weight (5th–84th percentile), Overweight (85th–94th percentile), Obese (≥ 95 th percentile).

Metabolic Parameters:

- Fasting blood glucose (mg/dL)
- Lipid profile (total cholesterol, triglycerides, HDL-C, LDL-C)
- Blood pressure measured using appropriately sized cuffs and classified per AAP guidelines.

Statistical Analysis: Data were analyzed using SPSS version 25. Descriptive statistics, chi-square tests, and Pearson correlation coefficients were used. $p < 0.05$ was considered statistically significant.

RESULTS

Out of 400 participants, 212 were boys and 188 girls. The prevalence of overweight and obesity was 11% (44/400) and 7% (28/400), respectively.

- Mean BMI:** Normal – 17.4 ± 2.1 ; Overweight – 22.8 ± 2.5 ; Obese – 26.7 ± 3.2 .
- Mean Fasting Glucose:** 83.6 ± 9.4 mg/dL (normal) vs. 96.3 ± 12.5 mg/dL (obese), $p < 0.05$.
- Mean Triglyceride Level:** 109 ± 18 mg/dL (normal) vs. 138 ± 25 mg/dL (obese), $p < 0.05$.
- HDL-C:** Significantly lower among obese children ($p < 0.05$).
- Blood Pressure:** Systolic BP above the 90th percentile in 12% of obese children.

No significant gender difference was found in the prevalence of obesity.

Tables

Table 1: Distribution Of BMI Categories (n = 400)

BMI Category	Boys (n=212)	Girls (n=188)	Total (n=400)	Percentage (%)
Normal	178	150	328	82
Overweight	20	24	44	11
Obese	14	14	28	7
Total	212	188	400	100

Table 2: Metabolic Parameters In Normal Vs Obese Children

Parameter	Normal Weight (n=328)	Obese (n=28)	p-value
Mean BMI (kg/m ²)	17.4 ± 2.1	26.7 ± 3.2	<0.001
Fasting Blood Glucose (mg/dL)	83.6 ± 9.4	96.3 ± 12.5	0.002
Total Cholesterol (mg/dL)	156 ± 22	178 ± 25	0.01
Triglycerides (mg/dL)	109 ± 18	138 ± 25	0.001
HDL Cholesterol (mg/dL)	49 ± 7	40 ± 6	0.001
LDL Cholesterol (mg/dL)	92 ± 15	112 ± 20	0.005
Systolic BP (mmHg)	96 ± 8	112 ± 10	0.003
Diastolic BP (mmHg)	62 ± 6	72 ± 8	0.004

Table 3: Blood Pressure Distribution in Obese Children (n = 28)

Blood Pressure Category	Number of Children	Percentage (%)
Normal (<90th percentile)	20	71
Elevated (90–95th percentile)	5	18
Hypertension (>95th percentile)	3	11

DISCUSSION

The present study evaluated the prevalence of obesity and associated metabolic complications among 400 school-going children aged 6–15 years in Godhi village and nearby areas of Raipur. Our findings demonstrate that childhood obesity, though often considered an urban phenomenon, is increasingly prevalent in semi-rural regions. In this study, the prevalence of overweight was 11% and obesity 7%, consistent with previous Indian studies reporting childhood obesity rates of 5–10% in similar semi-urban and rural populations (Bhave et al., 2019; Gupta et al., 2021).

The association of obesity with metabolic abnormalities was clearly observed. Obese children had significantly higher fasting blood glucose and triglyceride levels, lower HDL cholesterol, and elevated systolic and diastolic blood pressures compared to normal-weight peers. These findings reflect early metabolic derangements and are consistent with the established concept of pediatric metabolic syndrome. Early detection of such abnormalities is crucial, as they increase the risk for cardiovascular diseases and type 2 diabetes in later life.

Our results align with national and international data indicating that childhood obesity is not merely a cosmetic concern but a serious health issue with long-term consequences. For example, Misra et al. (2019) emphasized that even mild elevations in BMI in Indian children may be associated with adverse metabolic profiles, partly due to differences in body fat distribution and genetic susceptibility.

The study underscores the role of lifestyle and environmental factors in obesity development. Changes in dietary patterns, increased consumption of energy-dense foods, and sedentary behavior, including reduced physical activity and increased screen time, likely contribute to the rising prevalence in rural areas. The lack of awareness regarding healthy eating habits and limited access to structured physical activity programs in schools may further exacerbate the problem.

Interestingly, no significant gender differences were observed in obesity prevalence, suggesting that the lifestyle factors affecting both boys and girls are similar in this population. This contrasts with some urban studies, where male children often exhibit higher obesity rates due to differing activity patterns.

Public Health Implications: The findings highlight the need for preventive strategies, even in rural and semi-rural settings. School-based interventions, such as regular BMI screening, promotion of physical activity, nutrition education, and parental counseling, should be prioritized. Community health programs can play a pivotal role in raising awareness about the health risks associated with childhood obesity and encouraging healthy lifestyle practices.

Limitations: The study was cross-sectional and limited to a specific geographic area, restricting the generalizability of findings. Longitudinal studies are necessary to establish causal relationships between obesity and metabolic complications. Dietary intake, physical activity patterns, and socioeconomic status were not systematically assessed, which could have provided further insights into risk factors.

Conclusion: Childhood obesity is emerging as a significant health concern even in semi-rural areas of Raipur. Obese children are at increased risk of metabolic complications, which may predispose them to cardiovascular and endocrine disorders in the future. Early identification and targeted preventive measures are essential to mitigate long-term health risks.

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