

Original Research Article

PREVALENCE AND DETERMINANTS OF OVERWEIGHT IN SCHOOL-GOING ADOLESCENT GIRLS IN AN URBAN AREA OF ORAI: A CROSS-SECTIONAL EPIDEMIOLOGICAL STUDY

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ABSTRACT

Background: Aims and Objectives: To estimate the prevalence of overweight and determine its socio-demographic, dietary, lifestyle and behavioural determinants among school-going adolescent girls in urban city Orai, Bundelkhand region.

Materials and Methods: A school-based cross-sectional study was conducted among **420 adolescent girls (11–19 years)** in urban Orai from May 2024 to November 2025. Data were collected using a semi-structured questionnaire and anthropometric measurements. BMI was classified using WHO BMI-for-age criteria.

Results: The prevalence of **overweight was 9.05%** and **obesity was 0.24%**. Significant determinants included **increasing age (p=0.001)**, **positive family history (p=0.006)**, **physical inactivity (p=0.01)**, **short sleep duration (p=0.04)**, and **psychosocial stress related to weight (p=0.001)**. Multivariable regression identified age (AOR=1.89) and family history (AOR=2.13) as independent predictors.

Conclusion: Overweight is an emerging concern in urban Orai, driven by a mix of biological, behavioural, and psychological factors.

Keywords: Adolescent girls, Overweight, Obesity, Prevalence, Determinants, Urban health, BMI.

INTRODUCTION

Overweight and obesity among adolescents have emerged as one of the most serious public health challenges of the 21st century.^[1] Globally, the prevalence among children and adolescents aged 5–19 years has risen dramatically from 8% in 1990 to approximately 20% in 2022.^[2] This trend is no longer confined to high-income countries; developing nations are rapidly experiencing a "**nutrition transition**" characterized by shifts toward refined carbohydrates, saturated fats, and sedentary lifestyles.^[3]

India faces a unique challenge known as the "**double burden of malnutrition**," where high rates of underweight coexist with emerging overnutrition within the same community.^[4] Adolescent girls are particularly vulnerable, as excess weight during this

developmental window predisposes them to long-term complications, including Polycystic Ovarian Syndrome (PCOS), menstrual irregularities, and future metabolic risks like type 2 diabetes and hypertension.^[5] While metropolitan data are abundant, there is a significant gap in understanding these trends in smaller urban centres like Orai.

2. Aims and Objectives

The primary aim of this study was to find out the prevalence and determinants of overweight in school-going adolescent girls in the urban area of Orai.

Specific Objectives:

- To estimate the sociodemographic profile of the study participants.
- To estimate the prevalence of overweight and determine its risk factors.

- To determine the association of sociodemographic profiles and health problems with overweight status.
- To provide necessary recommendations to the community and schools.

MATERIALS AND METHODS

Study Design and Setting: A school-based cross-sectional observational study was conducted in urban Orai from May 2024 to November 2025. **Participants:** A calculated sample size of **420 adolescent girls** aged 11–19 years was recruited from government and private schools. Inclusion

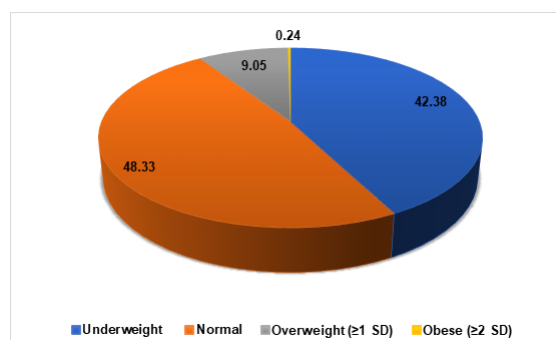
criteria required regular attendance for at least one year and informed assent. **Tools:** Data were collected using a pre-tested semi-structured questionnaire covering socio-demographics, dietary habits, physical activity, sleep patterns, and psychosocial factors. **Measurements:** Height and weight were recorded using standardized calibrated instruments. **Body Mass Index (BMI)** was calculated and classified according to **WHO BMI-for-age criteria** (Overweight: $>+1$ SD; Obese: $>+2$ SD). **Statistical Analysis:** Data were analysed using **SPSS version 21**. Descriptive statistics, Chi-square tests for associations, and multivariable logistic regression were applied, with $p < 0.05$ considered significant.

RESULTS

Table 1: Socio-Demographic Profile of Study Participants (n = 420)

Parameters	Frequency (n)	Percentage (%)
Age Group (Years)		
11–13 (Early adolescence)	80	19.05
14–16 (Middle adolescence)	208	49.52
17–19 (Late adolescence)	132	31.43
Religion		
Hindu	343	81.67
Muslim	75	17.86
Christian	02	0.48
Family History of OW/O		
Yes	111	26.43
No	309	73.57
Socioeconomic Status		
Middle Class	141	33.57
Lower Middle Class	212	50.48
Lower class	13	3.10
Number of Family Members		
≤ 4	84	20.00
5-6	198	47.14
≥ 7	138	32.86

Sociodemographic Profile: The majority of participants ie.208 (49.52%) were in middle adolescence (14–16 years). Most were Hindu ie.343(81.67%) and higher proportions belonged to nuclear families 261(62.14%). Family history of overweight/obesity was present in 111(26.43%) participants regarding socioeconomic class majority of them belonged to lower middle class ie.212(50.48%).



Graph 1: Distribution of Study Participants According to BMI Classification (WHO Criteria) (n = 420)

Out of 420 adolescent girls studied, nearly half (48.33%) had a normal BMI. A substantial proportion (42.38%) were **underweight**, the **prevalence of overweight was 9.05%**, while obesity was very low at 0.24% confirming the persistence of undernutrition alongside emerging overnutrition.

Table 2: Distribution of Study Participants According to Dietary Habits (n = 420)

Parameters	Frequency (n)	Percentage (%)
Type of Diet		
Vegetarian	178	42.38
Mixed	242	57.62
Skipping Breakfast		
≤3 times/week	263	62.62
≥3 times/week	157	37.38
Fast Food & Snacks Consumption		
Never	72	17.14
Once a week	219	52.14
Two–three times/week	129	30.71
Sugary Drinks Consumption		
Never	128	30.48
Once a week	206	49.05
Two–three times/week	81	19.29
Fruits & Vegetables Consumption		
Yes	331	78.81
No	89	21.19
Gadget Use During Meals		
Never	169	40.24
Sometimes/Often	251	59.76

Table 3: Distribution of Study Participants According to Lifestyle and Physical Activity Patterns (n = 420)

Parameters	Frequency (n)	Percentage (%)
Participation in Physical Activities		
Never	80	19.05%
Once a week	139	33.10%
Two–three times/week	108	25.71%
Daily	93	22.14%
Water Intake per Day		
1–2 glasses	13	3.10%
2–4 glasses	111	26.43%
4–6 glasses	203	48.33%
6–8 glasses	93	22.14%
Type of Physical Activity		
Walking	217	51.67%
Running	84	20.00%
Cycling	82	19.52%
Biking	17	4.05%
Sugary Drinks Consumption		
Never	128	30.48%
Once a week	206	49.05%
Two–three times/week	81	19.29%
Screen Time per Day		
<1 hour	121	28.81%
1–3 hours	241	57.38%
4–6 hours	55	13.10%
>6 hours	3	0.71%
Sleep Duration per Night		
<5 hours	7	1.67%
5–6 hours	90	21.43%
7–8 hours	265	63.10%
>8 hours	58	13.81%

Table 4: Distribution of Study Participants According to Body Satisfaction and Self-Concept (n = 420)

Parameters	Frequency (n)	Percentage (%)
Feeling About Current Body Weight		
Very satisfied	21	5.00
Satisfied	221	52.62
Neutral	97	23.10
Dissatisfied	79	18.81
Body Image Affects Confidence		
Yes	277	65.95
No	141	33.57
Feel Pressure to Change Weight		
Yes	113	26.90
No	305	72.62
Tried Weight Management Strategies		
Yes	163	38.81
No	255	60.71

Table 4: Distribution of Study Participants According to Mental and Emotional Well-Being (n = 420)

Parameters	Frequency (n)	Percentage (%)
Stress Related to Body Weight/Appearance		
Yes	80	19.05
No	337	80.24
Feels Confident About Body Most of the Time		
Yes	313	74.52
No	105	25.00
Experienced Teasing/Bullying Related to Weight		
Yes	69	16.43
No	349	83.10

Table 5: Multivariable Logistic Regression Results

Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Age Category	1.89	1.11 – 3.21	0.01
Family History	2.13	1.05 – 4.31	0.03
Physical Activity	1.29	0.91 – 1.80	0.14
Sleep Duration	1.3	0.75 – 2.24	0.35
Stress Related to Weight	2.06	0.98 – 4.30	0.05
Teasing/Bullying	2.16	0.87 – 5.38	0.09

Significant Determinants (Bivariate Analysis):

- **Age:** Prevalence was highest in late adolescence (17–19 years) at 16.7% (p=0.001).
- **Family History:** Participants with a positive family history of obesity had significantly higher rates of overweight (16.2% vs 6.8%, p=0.006).
- **Physical Activity:** Girls with lower activity levels showed higher overweight prevalence (p=0.01).
- **Sleep Duration:** Shorter sleep duration, particularly <6 hours, was significantly associated with higher weight status (p=0.04).
- **Psychosocial Factors:** Significant associations were found with **stress related to weight** (p=0.001) and experiences of **teasing or bullying** (p=0.001).

Multivariable Logistic Regression: When adjusted for other factors, the strongest independent predictors were **family history** (AOR = 2.13, 95% CI: 1.05–4.31) and **age category** (AOR = 1.89, 95% CI: 1.11–3.21).

DISCUSSION

The combined prevalence of overweight and obesity in Orai was 9.29%. This is comparable to rates found in North Kerala (11.6%)[6] but substantially lower than metropolitan Kolkata (>40%),[7] suggesting Orai is in an earlier stage of the nutritional transition. The strong association with late adolescence may be due to increased academic stress and reduced outdoor play as girls approach higher secondary levels, this finding is consistent with Ulasi et al.(2022).[8] The significant association found between family history of overweight/obesity(p=.006).Multivariate logistic regression analysis further confirm that a positive history had 2.13times higher odds of being overweight, finding aligns with finding from Ahmad et al.2021[9] and Nair and Chellappan(2021).[10], socioeconomic status (SES) was not significantly associated (p=0.69), indicating that overweight is

becoming a universal concern across different economic strata in smaller cities, In contrast ,Kumar and Faisal(2015) [11] and Goyal et al.(2010) [12]reported higher prevalence among affluent adolescents. Physical activity showed a statistically significant association with overweight(p=0.01),girls with lower levels of physical activity had higher prevalence of overweight ,this finding is consistent with Macwana et al.(2017) [13]and Nair and Chellappan[14].

Sleep duration showed a statistically significant association with overweight(p=0.04) this finding is comparable with Roy et.al(2022) [15].

The study highlights that psychosocial stress and bullying are critical determinants of overweight. Logistic regression analysis also showed that stress related to body weight increased odds of overweight(AOR=2.06).

Unlike studies focusing solely on physical factors, these findings suggest a bidirectional relationship where obesity leads to reduced confidence and social stigma, which may further exacerbate unhealthy coping behaviours.

Overall the finding of present study demonstrate that overweight among adolescent girls in urban Orai is moderate but significant .

CONCLUSION

Overweight among adolescent girls in urban Orai is a significant emerging health issue driven by a complex interplay of biological, behavioural, and psychological factors. While the prevalence is lower than in major metropolises, the presence of modifiable risk factors like physical inactivity and inadequate sleep indicates an urgent need for preventive action during this critical window of development.

7. Limitations and Recommendations

Limitations: The study utilized a **cross-sectional design**, which limits the ability to establish definitive

causal relationships. Additionally, dietary data may be subject to **recall bias** or underreporting of unhealthy habits.

Recommendations

1. **School-Based Screening:** Implement regular growth monitoring and BMI screening to identify at-risk girls early.
2. **Activity Promotion:** Mandatory physical education periods and limiting sedentary screen time.
3. **Family Engagement:** Education programs for parents on healthy dietary habits and the importance of adequate sleep.
4. **Mental Health Support:** Provide school-based counselling to address body image concerns and bullying.
5. **Policy Interventions:** Regulate the availability of junk food around school premises.

REFERENCES

1. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser. 2000;894:i-xii, 1-253.
2. World Health Organization. Obesity and overweight [Internet]. Geneva: WHO; 2024 Mar 1 [cited 2026 Feb 17]. Available from: <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
3. Gupta N, Goel K, Shah P, Mishra A. Childhood obesity in developing countries: epidemiology, determinants, and prevention. *Endocr Rev.* 2012;33(1):48-70.
4. World Health Organization. The double burden of malnutrition: policy brief [Internet]. Geneva: WHO; 2017 [cited 2026 Feb 17]. Available from: <https://www.who.int/publications/i/item/WHO-NMH-NHD-17.3>
5. Hales CM, Fryar CD, Carroll MD, Freedman DS, Ogden CL. Trends in obesity and severe obesity prevalence in US youth and adults by sex and age, 2007-2008 to 2015-2016. *JAMA.* 2018;319(16):1723-5.
6. Viswambharan, Jaya & Bina, Thomas & Raphael, Lucy. (2020). Prevalence and determinants of obesity among adolescent school children of North Kerala. *International Journal of Community Medicine and Public Health.* 7. 3142. 10.18203/2394-6040.ijcmph20203391.
7. Roy, Papiya & Chakrabarty, Suman & Chatterjee, Diptendu & Bharati, Premananda. (2022). Prevalence and Factors Associated with Overweight/Obesity in Adolescent School Girls: A Cross-Sectional Study in Kolkata, India. *Anthropological Review.* 85. 147-162. 10.18778/1898-6773.85.2.08.
8. Agu NV , Ulasi TO , Okeke KN , Ebenebe JC , Echendu ST , Nri-Ezedi CA , Nwaneli EI , Edokwe ES , Onah SK , Ifezulike CC , Umeadi ES. Prevalence of Overweight and Obesity among Secondary Schools Adolescents in Onitsha, Anambra State Nigeria. *IJMC. /ijmsci.* Vol 9, Issue 01, (2022) . Published: Jan 06, 2022 DOI: 10.18535/ijmsci/v9i01.02 . Pages: 5891-5899
9. Ahmad A, Zulaily N, Shahril MR, Wafa SW, Mohd Amin R, Piernas C, Ahmed A. Obesity determinants among Malaysian 12-year old school adolescents: findings from the HAT study. *BMC Pediatr.* 2021 Sep 23;21(1):418. doi: 10.1186/s12887-021-02899-3. PMID: 34556071; PMCID: PMC8459530.
10. Nair, Greeshma & Chellappan, Vimala. (2021). Prevalence and Determinants of Overweight and Obesity among Urban School Going Adolescents in South Kerala - A Community Based Cross Sectional Study. *Journal of Evidence Based Medicine and Healthcare.* 8. 1733-1738. 10.18410/jebmh/2021/328.
11. Kumar AP, Faisal MGD. Prevalence and determinants of overweight and obesity among affluent adolescents in Vijayawada city, Andhra Pradesh, India. *Int J Med Sci Public Health.* 2015;4(1):88-93.
12. Goyal RK, Shah VN, Saboo BD, Phatak SR, Shah NN, Gohel MC, et al. Prevalence of overweight and obesity in Indian adolescent school going children: its relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India.* 2010;58:151-8
13. Macwana JI, Mehta K, Baxi RK. Predictors of overweight and obesity among school going adolescents of Vadodara city in Western India. *Int J Adolesc Med Health.* 2017;29(6). doi:10.1515/IJAMH-2015-0078
14. Nair, Greeshma & Chellappan, Vimala. (2021). Prevalence and Determinants of Overweight and Obesity among Urban School Going Adolescents in South Kerala - A Community Based Cross Sectional Study. *Journal of Evidence Based Medicine and Healthcare.* 8. 1733-1738. 10.18410/jebmh/2021/328.
15. Roy, Papiya & Chakrabarty, Suman & Chatterjee, Diptendu & Bharati, Premananda. (2022). Prevalence and Factors Associated with Overweight/Obesity in Adolescent School Girls: A Cross-Sectional Study in Kolkata, India. *Anthropological Review.* 85. 147-162. 10.18778/1898-6773.85.2.08