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Prevalence of Overweight and Obesity and Associated Lifestyle Factors Among Apparently Healthy School-Going Children Aged 5–15 Years in Urban Lucknow: A Cross-Sectional Study

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ABSTRACT

Background: The growing burden of obesity among children in India represents a serious public health problem, associated with rapid urban development, nutritional transitions, reduced exercise, and higher screen time.Early identification of obesity and its associated determinants is essential to prevent long-term metabolic and cardiovascular complications.

Objectives : To determine the prevalence of overweight and obesity among apparently healthy school-going children aged 5–15 years in Sarvodaya Nagar, Lucknow, and to assess their association with socio-economic status, dietary habits, physical activity, screen time, and lifestyle practices.

Materials and Methods: A cross-sectional study was conducted among 400 school children aged 5–15 years selected using multistage random sampling from four schools in Sarvodaya Nagar, Lucknow. Anthropometric measurements were obtained using standardized techniques. Data on socio-demographic variables, dietary patterns, physical activity, screen time, and lifestyle practices were collected using a pre-tested structured questionnaire. Statistical analysis was performed using SPSS version 25.0, with $p < 0.05$ considered statistically significant.

Results: The prevalence of overweight and obesity was 12.5% and 6.5%, respectively. Overweight and obesity were more common in the 13–15-year age group. A statistically significant association was observed between BMI categories and socio-economic status, dietary habits, and screen time ($p < 0.001$). Children consuming predominantly fast food and those with screen time exceeding four hours per day had a higher prevalence of overweight and obesity.

Conclusion: A substantial proportion of urban school-going children were affected by overweight and obesity. Lifestyle-related factors such as unhealthy diet and excessive screen time played a significant role. School-based health education and lifestyle modification programs are urgently required to curb the rising burden of childhood obesity.

KEYWORDS: Childhood obesity; Overweight; Body mass index; School children; Screen time; Lifestyle factors; India.

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INTRODUCTION

Childhood obesity has emerged as one of the most serious public health challenges of the twenty-first century. The World Health Organization (WHO) recognizes childhood obesity as a major non-communicable disease risk factor because of its strong association with adverse health outcomes extending into adulthood, including cardiovascular disease, type 2 diabetes mellitus, and premature mortality [1,2].

Although obesity was traditionally considered a health issue of high-income countries, recent decades have witnessed a rapid increase in childhood overweight and obesity in low- and middle-income countries, including India [3,4]. Rapid urbanization, economic growth, globalization of food markets, and lifestyle transitions have significantly altered dietary patterns and physical activity levels among children [5,6].

At a global level, over 340 million children and adolescents (5–19 years) were identified as overweight or obese in 2016, with prevalence figures continuing to climb [7]. India is currently experiencing a dual burden of malnutrition, where undernutrition coexists with rising rates of overweight and obesity, particularly in urban populations [8,9]. National surveys and regional studies have documented a steady increase in childhood obesity over the past two decades [10–12].

Childhood obesity is associated with multiple short- and long-term health consequences. Obese children are more likely to develop insulin resistance, dyslipidemia, hypertension, and impaired glucose tolerance during adolescence [13–15]. Furthermore, obesity during childhood strongly tracks into adulthood, increasing the risk of cardiovascular disease and metabolic syndrome later in life [16,17]. Psychosocial consequences such as poor self-esteem, anxiety, depression, and social stigma have also been widely reported [18].

The etiology of childhood obesity is multifactorial, involving genetic susceptibility interacting with environmental and behavioral factors [19]. However, the rapid rise in prevalence suggests that lifestyle and environmental determinants play a predominant role [20]. The move toward diets high in calories but low in nutrients, along with greater consumption of sugary drinks and fast food, has contributed substantially to excess energy intake among children [21–23].

Physical inactivity is another critical determinant of childhood obesity. Urban living has resulted in reduced outdoor play, limited recreational spaces, academic pressures, and increased reliance on motorized transport [24]. In addition, excessive screen time due to television viewing, smartphones, tablets, and computers has become increasingly common among children and adolescents [25,26]. Prolonged screen exposure is associated with sedentary behavior, unhealthy snacking, and exposure to food advertising [27].

Socio-economic status (SES) plays a complex role in the distribution of childhood obesity in developing countries. Children from higher and middle socio-economic strata are more likely to be overweight or obese due to increased access to calorie-dense foods and sedentary entertainment, whereas children from lower socio-economic groups continue to suffer from undernutrition [28–30]. This phenomenon reflects the ongoing nutritional transition in India.

Schools represent an important setting for the prevention and early identification of childhood obesity. School-based interventions focusing on nutrition education, promotion of physical activity, and healthy lifestyle practices have been shown to be effective in controlling childhood obesity [31,32]. However, despite increasing awareness, a significant gap persists between knowledge and actual health practices among children and parents [33].

Most studies on childhood obesity in India have been conducted in metropolitan cities, with limited data from smaller urban localities, especially in North India [34]. Region-specific data are essential for planning targeted interventions. “Therefore, the present study was undertaken to assess the prevalence of overweight and obesity and to evaluate associated socio-demographic and lifestyle factors among apparently healthy school-going children aged 5–15 years in Sarvodaya Nagar, Lucknow” [35].

MATERIALS AND METHODS

“A cross-sectional study was conducted among 400 school children aged 5–15 years selected using multistage random sampling from four schools in Sarvodaya Nagar, Lucknow”. Anthropometric measurements were obtained using standardized techniques. Body mass index (BMI) was calculated and classified according to WHO age- and sex-specific BMI percentiles. Data on socio-demographic variables, dietary patterns, physical activity, screen time, and lifestyle practices were collected using a pre-tested structured questionnaire.

Study Period
May 2024 to December 2025.
Study Population
Apparently healthy school-going children aged 5–15 years.
Sample Size
400 children.
Sampling Technique
Multistage random sampling without replacement.
Inclusion Criteria
1. Children aged 5–15 years
2. Apparently healthy children
3. Written informed consent from parents/guardians

Exclusion Criteria
1. Children with chronic illnesses
2. Children on long-term medications
3. Children with congenital anomalies
4. Secondary causes of obesity

Data Collection
Anthropometric measurements were recorded using standardized procedures. BMI was calculated and classified using WHO age- and sex-specific percentiles. A structured questionnaire assessed socio-economic status, dietary habits, physical activity, screen time, and lifestyle practices.
Statistical Analysis
Data were analyzed using SPSS version 25.0. Chi-square test and correlation analysis were used. A p-value < 0.05 was considered statistically significant.

RESULTS

A total of 400 children were included in the study. The majority belonged to the 13–15-year age group (44%). Males constituted 61% of the study population. Overweight affected 12.5% of the population, while obesity was observed in 6.5%.Overweight and obesity were more prevalent among older children and those belonging to upper-middle and lower-middle socio-economic classes. Children consuming fast food and those with screen time exceeding four hours per day had significantly higher BMI values. A statistically significant association was observed between BMI categories and socio-economic status, dietary habits, and screen time.

"In our study, a total of 400 children were studied. There were 84 children (21.0%) in the 5-8 years age group, 140 children (35.0%) were in the 9-12 years age group, and 176 children (44.0%) were in the 13-15 years age group".

Table2:Distributionofthestudiedchildrenbasedontheirage

Ageinyears	No.ofcases(n=400)	Percentage
5-8	84	21.0
9-12	140	35.0
13-15	176	44.0

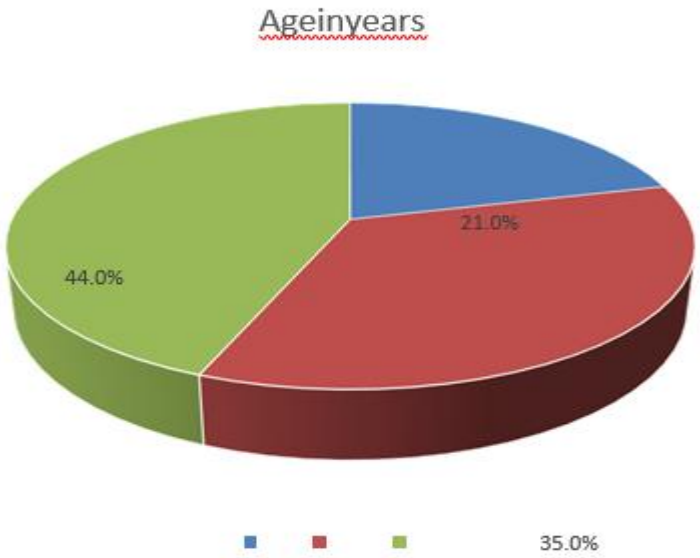

Figure2:Distributionofthestudiedchildrenbasedontheir age

Among the 400 children studied, 244 children (61.0%) were male and 156 children (39.0%) were female.

Table3:Distributionofthestudied children basedontheirgender

Gender	No.ofcases(n=400)	Percentage
Male	244	61.0
Female	156	39.0

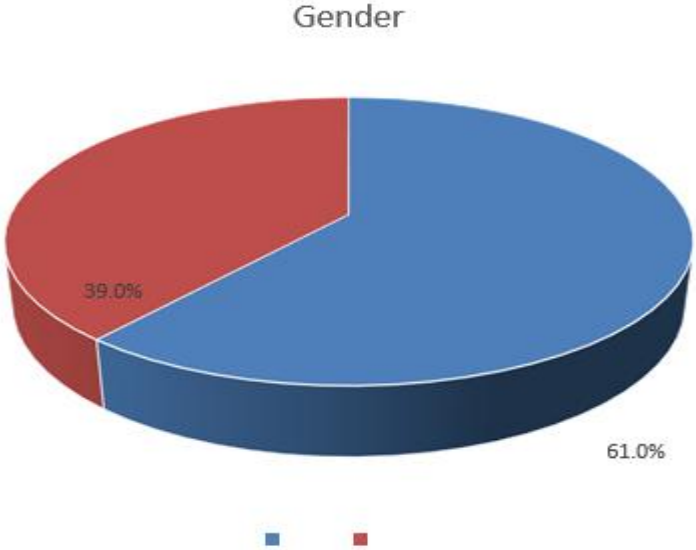

Figure3:Distributionofthestudiedchildrenbasedontheirgender

Among the 400 children studied, 260 children (65.0%) were aware of junk food consumption asariskfactor, 236children (59.0%)recognized lack of physicalactivity, 220children (55.0%) identified excessive screen time, 200 children (50.0%) acknowledged sugary drinks, and 148 children (37.0%) were aware of family history as a contributing risk factor.

Table4:AwarenessofRiskFactorsforObesityamongChildren

RiskFactorAwareness	No.ofcases(n=400)	Percentage
Junkfoodconsumption	260	65.0
Lackofphysicalactivity	236	59.0
Excessivescreentime	220	55.0
Sugarydrinks	200	50.0
Familyhistory	148	37.0

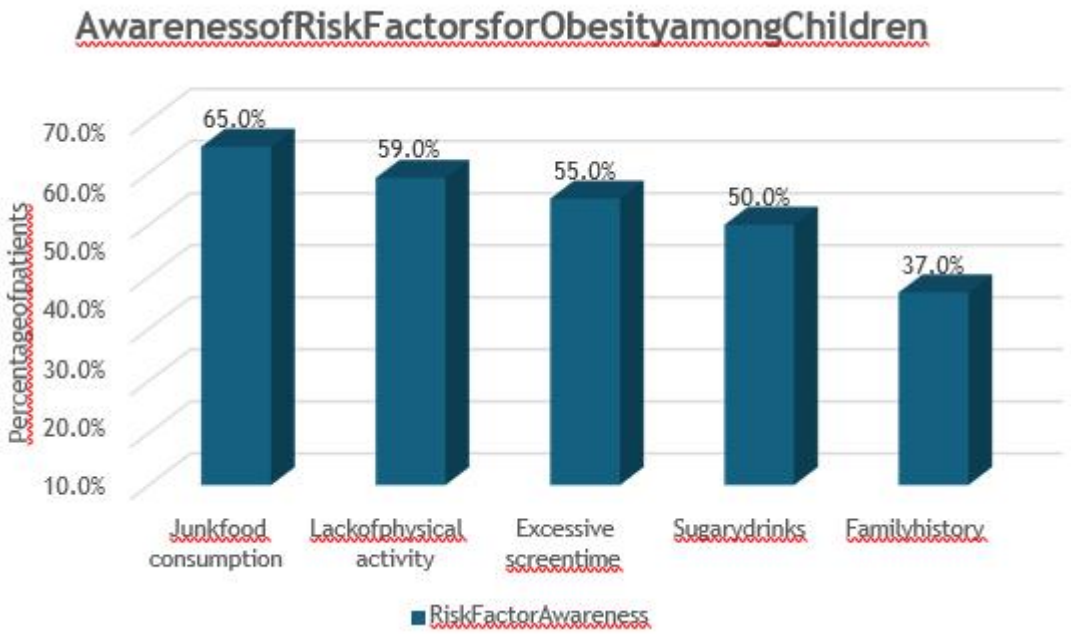

Figure4:AwarenessofRiskFactorsforObesityamongChildren

48 children (12.0%) belonged to the upper class, 104 children (26.0%) to the upper middle class, 140 children (35.0%) to the lower middle class, 84 children (21.3%) to the upper lower class, and 24 children (6.0%) to the lower class.

Table5:DistributionofStudyPopulationbySocio-economicStatus(SES)

SES	No.ofcases(n=400)	Percentage
Upper	48	12.0
UpperMiddle	104	26.0
LowerMiddle	140	35.0
UpperLower	84	21.3
Lower	24	6.0

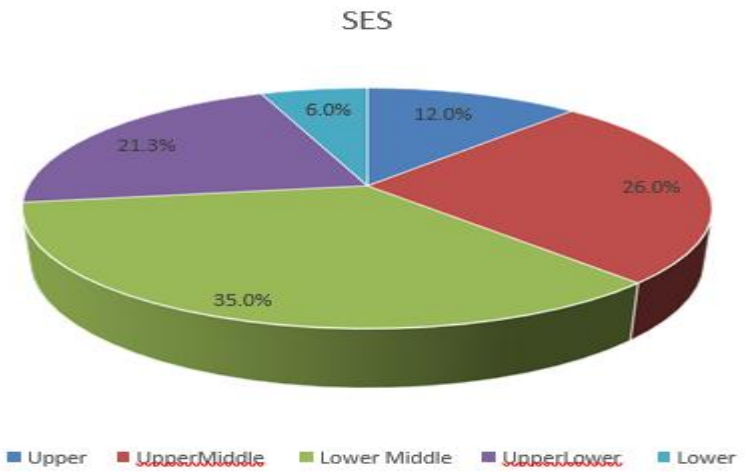

Figure5:DistributionofStudyPopulationbySocio-economicStatus(SES)

(12.0%)wereunderweight(belowthe5thpercentile),276children(69.0%)hadnormalweight (5thto85thpercentile),50children(12.5%)wereoverweight(85thto95thpercentile),and26 children (6.5%) were obese (above the 95th percentile).

Table6:BMIClassificationofChildren(WHOGrowthReference)[ObesityPrevalence]

BMI	No.ofcases(n=400)	Percentage
Underweight(<5th%)	48	12.0
Normal(5th–85th%)	276	69.0
Overweight(85th–95th%)	50	12.5
Obese(>95th%)	26	6.5

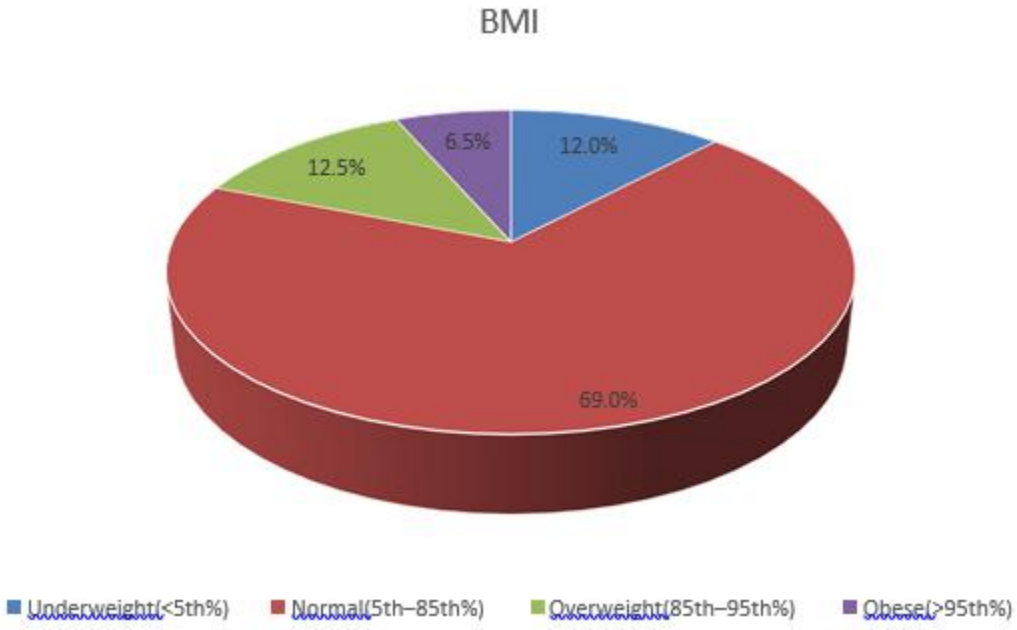

Figure6:BMIClassificationofChildren(

Inourstudy,theage-wisedistributionofBMIcategoriesamongthe400childrenrevealedthat underweightwasmostprevalentinthe9-12yearsgroup(22children,45.8%ofallunderweight cases), followed by the 5-8 years group (15 children, 31.25%) and the 13-15 years group (11 children, 22.9%). Normal weight was most common in the 13-15 years group (131 children, 47.5%ofallnormalweightcases),followedbythe9-12yearsgroup(89children,32.2%)and the 5-8 years group (56 children, 20.3%). Overweight prevalence was highest in the 13-15 yearsgroup(22children,44.0%ofalloverweightcases),followedbythe9-12yearsgroup(19 children,38.0%)andthe5-8yearsgroup(9children,18.0%).Obesitywasalsomostprevalent in the 13-15 years group (12 children, 46.2% of all obese cases), followed by the 9-12 years group(10children,38.5%)andthe5-8yearsgroup(4children,15.4%).Thedifferencesacross age groups were not statistically significant (p-value = 0.071).

Table7:Age-wisePrevalenceofOverweightandObesity

Ageinyears	Underweight(n=48)	Normal(n=276)	Overweight(n=50)	Obese(n=26)	p-value
5-8	15 (31.3)	56 (20.3)	9 (18.0)	4 (15.4)	0.071
9-12	22 (45.8)	89 (32.2)	19 (38.0)	10 (38.5)	
13-15	11 (22.9)	131 (47.5)	22 (44.0)	12 (46.2)	

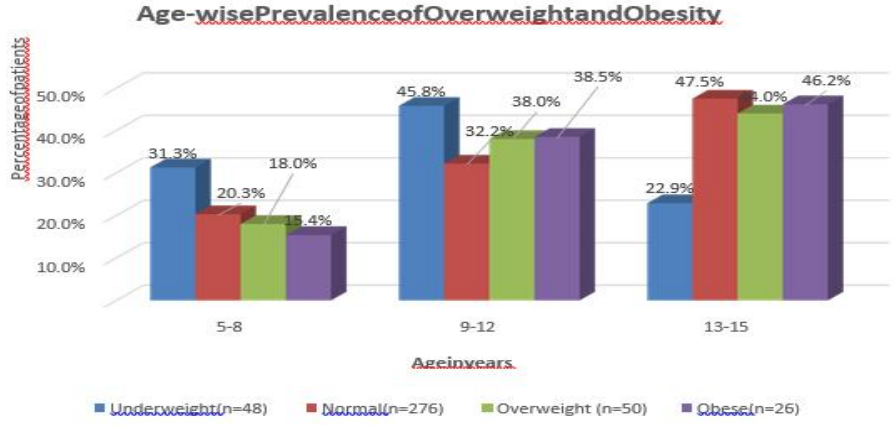

Figure7:Age-wisePrevalenceofOverweightandObesity

Inourstudy,underweightwasmorecommoninmales(30children,62.5%ofallunderweight cases) than in females (18 children, 37.5%). Normal weight was also slightly more prevalent inmales(175children,63.4%ofallnormalweightcases)comparedtofemales(101children, 36.6%).Overweightwasobservedin27males(54.0%ofalloverweightcases)and23females (46.0%), while obesity was more prevalent in females (14 children, 53.8% of all obese cases) than in males (12 children, 46.2%). The differences across gender were not statistically significant (p-value = 0.245).

Table8:Sex-wisePrevalenceofOverweightandObesity

Gender	Underweight(n=48)	Normal(n=276)	Overweight(n=50)	Obese(n=26)	p-value
Male	30 (62.5)	175 (63.4)	27 (54.0)	12 (46.2)	0.245
Female	18 (37.5)	101 (36.6)	23 (46.0)	14 (53.8)	

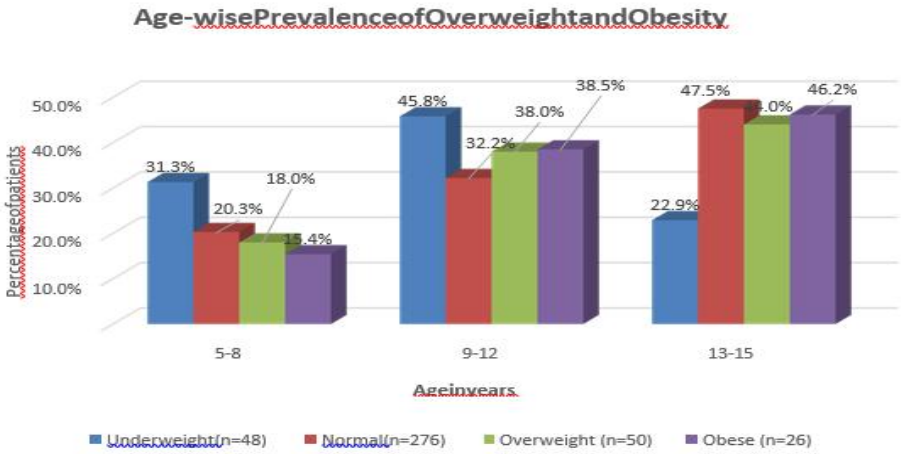

Figure8:Sex-wisePrevalenceofOverweightandObesity

In our study, underweight was most prevalent in the lower class (15 children, 31.3% of all underweightcases),followedbytheupperlowerclass(14children,29.2%),lowermiddleclass (13children,27.1%),uppermiddleclass(4children,8.3%),andupperclass(2children,4.2%). Normalweightwasmostcommoninthelowermiddleclass(102children,36.9%ofallnormal weightcases),followedbytheuppermiddleclass (77children, 27.9%),upperlowerclass(60 children, 21.7%), upper class (34 children, 12.3%), and lower class (3 children, 1.1%). Overweightwashighestinthelowermiddleclass(17children,34.0%ofalloverweightcases), followedbytheuppermiddleclass(15children,30.0%),upperclass(8children,16.0%),upper lowerclass(6children,12.0%),andlowerclass(4children,8.0%).Obesitywasmostprevalent in the upper middle and lower middle classes (8 children each, 30.8% of all obese cases), followedbytheupperandupperlowerclasses(4childreneach,15.4%),andthelowerclass(2 children, 7.6%). The differences in BMIcategories across socio-economic status groups were statistically significant (p-value < 0.001).

Table9:PrevalenceofOverweightandObesitybySES

SES	Underweight(n=48)	Normal(n=276)	Overweight(n=50)	Obese(n=26)	p-value
Upper	2 (4.2)	34 (12.3)	8 (16.0)	4 (15.4)	**<0.001**
UpperMiddle	4 (8.3)	77 (27.9)	15 (30.0)	8 (30.8)	
LowerMiddle	13 (27.1)	102 (36.9)	17 (34.0)	8 (30.8)	
UpperLower	14 (29.2)	60 (21.7)	6 (12.0)	4 (15.4)	
Lower	15 (31.3)	3 (1.1)	4 (8.0)	2 (7.6)	

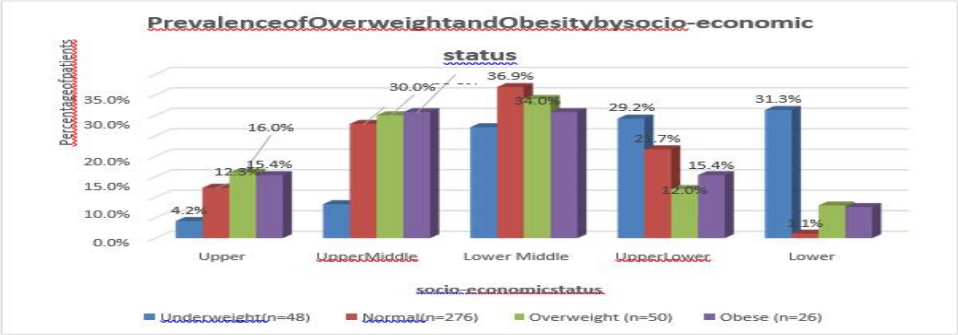

Figure9:PrevalenceofOverweightandObesityby SES

Among the 400 children studied, the distribution based on type of food consumption showed that 224 children(56.0%)predominantly consumed home-cooked food,112 children (28.0%) hadamixedpatternofhome-cookedandoutsidefood,and64children(16.0%)predominantly consumed fast or junk food.

Table10:Distributionoftypeoffoodconsumption

TypeofFoodConsumption	No.ofcases(n=400)	Percentage
Predominantlyhome-cooked	224	56.0
Mixed(home+outside)	112	28.0
Predominantlyfast/junkfood	64	16.0

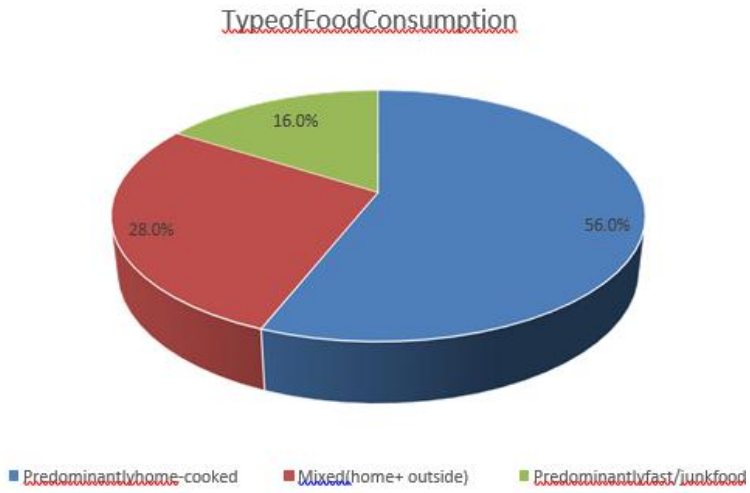

Figure10:Distributionoftypeoffoodconsumption

TheassociationbetweentypeoffoodconsumptionandBMIcategoriesamongthe400children showedthatpredominantlyhome-cookedfoodwasmostcommoninthenormalweightgroup (176 children, 63.8% of all normal weight cases) and underweight group (23 children, 47.9% ofallunderweightcases),butlessprevalentintheoverweightgroup(17children,34.0%ofall overweight cases) and obese group (8 children, 30.8% of all obese cases). A mixed pattern (home-cooked and outside food) was observed in 18 underweight children (37.5% of all underweightcases),61normalweightchildren (22.1%),23overweight children (46.0%),and 10obesechildren(38.4%).Predominantlyfast/junkfoodconsumptionwashighestintheobese group (8 children, 30.8% of all obese cases), followed by the overweight group (10 children, 20.0%), underweight group (7 children, 14.6%), and normal weight group (39 children, 14.1%).ThedifferencesinBMIcategoriesacrosstypesoffoodconsumptionwerestatistically significant (p-value < 0.001).

Table11:Associationoftypeoffoodconsumptioninrelationtooverweightandobesity

TypeofFood Consumption	Underweight (n=48)	Normal (n=276)	Overweight (n=50)	Obese (n=26)	p-value
Predominantly home-cooked	23 (47.9)	176 (63.8)	17 (34.0)	8 (30.8)	
Mixed(home+outside)	18 (37.5)	61 (22.1)	23 (46.0)	10 (38.4)	**<0.001**
Predominantlyfast/junk food	7 (14.6)	39 (14.1)	10 (20.0)	8 (30.8)	

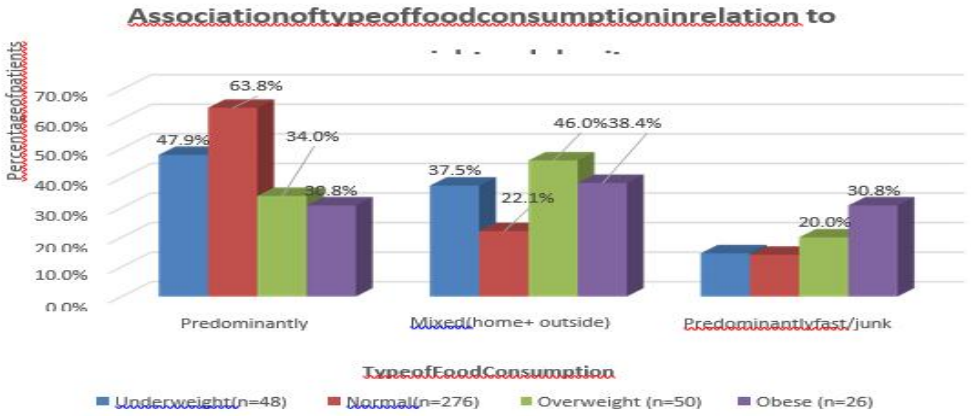

Figure11:Associationoftypeoffoodconsumptioninrelationtooverweightandobesity

Among the 400 children studied, the distribution based on daily screen time showed that 176 children (44.0%) spent less than 2 hours per day on screens, 136 children (34.0%) spent 2–4 hours per day, and 88 children (22.0%) spent more than 4 hours per day.

Table12:DistributionofChildrenbyDailyScreenTime

ScreenTime(hours)	No.ofcases(n=400)	Percentage
<2hours/day	176	44.0
2–4 hours/day	136	34.0
>4hours/day	88	22.0

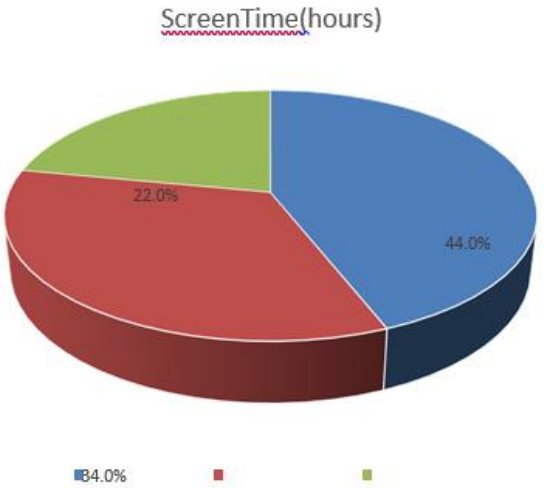

Figure12:DistributionofChildrenbyDailyScreenTime

TheassociationbetweendailyscreentimeandBMIcategoriesamongthe400childrenrevealed that screen time of less than 2 hours per day was most prevalent in the normal weight group (148 children, 53.6% of all normal weight cases), followed by the overweight group (12 children, 24.0%), obese group (6 children, 23.2%), and underweight group (10 children, 20.8%).Screentimeof2–4hoursperdaywasobservedin96normalweightchildren(34.8%), 18 overweight children (36.0%), 10 obese children (38.4%), and 12 underweight children (25.0%). Excessive screen time of more than 4 hours per day was most common in the underweightgroup(26children,54.2%ofallunderweightcases),followedbytheoverweight group (20 children, 40.0%) and obese group (10 children, 38.4%), but least in the normal weight group (32 children, 11.6%). The differences in BMI categories across screen time groups were statistically significant (p-value < 0.001).

Table13:AssociationofScreenTimewithOverweightand Obesity

ScreenTime (hours)	Underweight (n=48)	Normal (n=276)	Overweight (n=50)	Obese (n=26)	p-value
<2hours/day	10 (20.8)	148 (53.6)	12 (24.0)	6 (23.2)	**<0.001**
2–4 hours/day	12 (25.0)	96 (34.8)	18 (36.0)	10 (38.4)	
>4hours/day	26 (54.2)	32 (11.6)	20 (40.0%)	10 (38.4)	

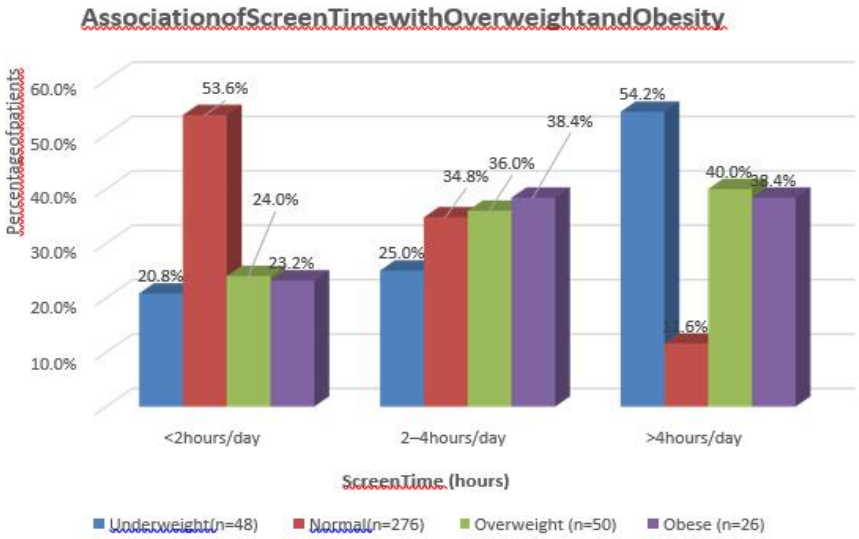

Figure13:**AssociationofScreenTimewithOverweightandObesity**

Among the 400 children studied, 276 children (69.0%) were aware of the importance of a balanced diet, 250 children (62.5%) recognized regular exercise, 236 children (59.0%) knew aboutlimitingjunkfood,200children(50.0%)acknowledgedadequatesleep,and188children (47.0%) were aware of reducing screen time.

Table14:KnowledgeaboutPrevention&LifestyleModification

PreventiveMeasureAwareness	No.ofcases(n=400)	Percentage
Balanceddiet	276	69.0
Regularexercise	250	62.5
Limitingjunkfood	236	59.0
Adequatesleep	200	50.0
Reducingscreentime	188	47.0

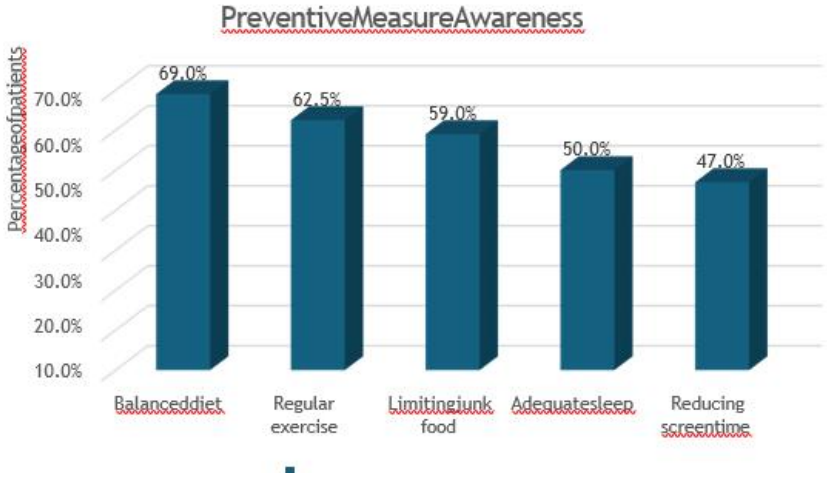

Figure14:KnowledgeaboutPrevention&LifestyleModification

Among the 400 children studied, 224 children (56.0%) practised daily physical activity of at least30minuteswhile176(44.0%)didnot;250children(62.5%)atefruitsorvegetablesdaily while 150 (37.5%) did not; 188 children (47.0%) limited junk food consumption to less than twiceperweekwhile212(53.0%)didnot;176children(44.0%)keptscreentimeunder2hours per day while 224 (56.0%) did not; and 264 children (66.0%) obtained adequate sleep of at least 8 hours per day while 136 (34.0%) did not.

Table15:PracticeofHealthyLifestyleHabitsamongChildren

LifestylePractice	Practisingn(%)	NotPractisingn (%)
Dailyphysicalactivity≥30 min	224 (56.0%)	176 (44.0%)
Eatingfruits/vegetablesdaily	250 (62.5%)	150 (37.5%)
Limitingjunkfoodto<2times/week	188 (47.0%)	212 (53.0%)
Screentime<2hours/day	176 (44.0%)	224 (56.0%)
Adequatesleep(≥8hours/day)	264 (66.0%)	136 (34.0%)

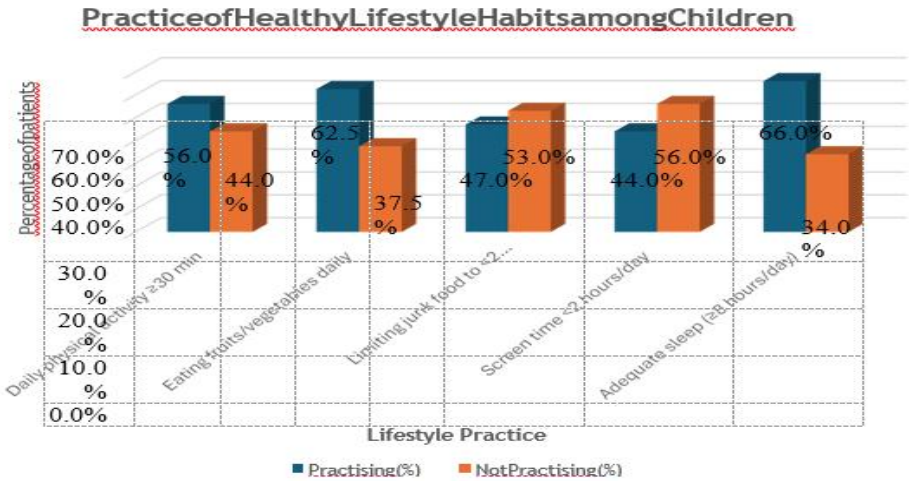

Figure15:PracticeofHealthyLifestyleHabitsamongChildren

DISCUSSION

This urban-based cross-sectional study assessed overweight and obesity prevalence and investigated related socio-demographic and lifestyle determinants in schoolchildren aged 5–15 years in Lucknow.

"In the present study, the prevalence of overweight and obesity was found to be 12.5% and 6.5%, respectively". The combined prevalence of excess weight (19%) is comparable to several urban Indian studies reporting prevalence ranging from 15% to 25% [13,14,36]. This rising trend reflects the ongoing nutrition transition associated with urbanization and lifestyle changes [20,28].

Age-wise analysis revealed that overweight and obesity were more prevalent in the 13–15-year age group. Similar age-related increases have been reported in other Indian and international studies [17,37]. Adolescence is a critical period characterized by pubertal hormonal changes, increased autonomy in food choices, reduced physical activity due to academic pressure, and increased screen exposure, all of which contribute to weight gain [38].

Gender-wise distribution showed that overweight was slightly more common among males, while obesity was marginally higher among females; however, the difference was not statistically significant. Previous studies from India have reported mixed gender patterns, with some studies showing male predominance and others reporting higher obesity rates among females [14,39]. Cultural practices, gender-specific physical activity patterns, and biological differences in fat distribution may explain these variations [40].

Socio-economic status demonstrated a statistically significant association with BMI categories in the present study. Overweight and obesity were most prevalent among children belonging to the upper middle and lower middle socio-economic classes, while underweight predominated in lower socio-economic groups. This finding is consistent with earlier studies documenting higher obesity prevalence among children from affluent and middle-income families in urban India [28–30,41]. The persistence of undernutrition among lower socio-economic groups highlights the dual burden of malnutrition in developing countries [9].

Dietary habits were significantly associated with overweight and obesity. Children who predominantly consumed fast or junk food had a higher prevalence of overweight and obesity, whereas consumption of home-cooked food was more common among children with normal BMI. Numerous studies have demonstrated that frequent consumption of fast food, sugar-sweetened beverages, and processed snacks is associated with increased adiposity in children [21–23,42].

Screen time emerged as a strong determinant of overweight and obesity in the present study. Children spending more than four hours per day on screens had significantly higher BMI values. Similar associations between excessive screen time and childhood obesity have been reported globally [25–27,43]. Screen-based sedentary behavior reduces energy expenditure and promotes unhealthy eating habits, contributing to positive energy balance [44].

Despite moderate awareness regarding obesity risk factors and preventive measures, a substantial gap between knowledge and healthy practices was observed. This finding aligns with previous studies indicating that awareness alone is insufficient to bring about behavioral change [33,45,46]. Environmental and social factors play a critical role in shaping children's behaviors.

The findings of the present study gain further significance when viewed in light of the most recent national and global evidence. Recent reports published in 2025 confirm that childhood overweight and obesity are continuing to rise at an alarming pace, particularly in low- and middle-income countries undergoing rapid urbanization. A UNICEF India report released in 2025 highlighted that overweight and obesity are increasing across all age groups in India, including school-aged children and adolescents, emphasizing the urgent need for early preventive strategies [47].

"The prevalence of obesity observed in the present study (6.5%) is comparable with recent pooled estimates reported in a 2025 meta-analysis of Indian school-going children, which documented an obesity prevalence ranging between 5% and 8%, with higher rates in urban populations" [48]. This similarity suggests that the findings from Sarvodaya Nagar, Lucknow, are representative of broader urban trends in India.

Recent national policy documents published in 2025 by the Ministry of Health and Family Welfare, Government of India, have emphasized childhood obesity as a priority public health issue requiring multisectoral action involving schools, families, and communities [49]. The significant association between socio-economic status, dietary habits, screen time, and obesity observed in the present study aligns closely with these national observations.

Globally, a large-scale analysis published in 2025 examining worldwide trends in childhood overweight and obesity over the past two decades reported a steady rise in adolescent obesity, particularly in urban settings [50].

Furthermore, a comprehensive 2025 review on childhood obesity risk factors highlighted that excessive screen time, frequent consumption of fast food, inadequate physical activity, and urban lifestyle transitions are key drivers of pediatric obesity [51]. These factors were also identified as significant determinants in the present study, reinforcing the consistency of our findings with contemporary evidence.

Despite increased awareness regarding healthy diet and physical activity, recent literature emphasizes that awareness alone is insufficient to bring about sustained behavioral change [51]. This observation is reflected in the present study, where a

substantial gap was noted between knowledge and actual healthy lifestyle practices among children. This highlights the need for structured, behavior-oriented interventions rather than solely information-based approaches.

Overall, the present study, supported by the latest 2025 national and international evidence proves that School-based screening, promotion of healthy dietary practices, reduction in screen time, and encouragement of regular physical activity should be prioritized to prevent the progression of childhood obesity into adulthood.

"The findings of the present study underscore the importance of school-based and family-centered interventions. Promotion of healthy eating habits, regular physical activity, and restriction of screen time from early childhood are essential strategies to prevent obesity and its long-term consequences" [31,32,46].

Overall, this research strengthens the existing body of literature indicating that childhood obesity is a rising health issue in urban Indian settings. Early identification and comprehensive lifestyle modification programs are urgently required to prevent the progression of childhood obesity into adulthood and to reduce the burden of non-communicable diseases [1,16].

CONCLUSION

Childhood overweight and obesity are prevalent among urban school-going children in Lucknow and are strongly associated with lifestyle factors such as unhealthy diet and excessive screen time. Early preventive strategies focusing on lifestyle modification at school and family levels are urgently required.

LIMITATIONS

- Cross-sectional design limits causal inference
- Self-reported lifestyle data may introduce reporting bias
- Study confined to an urban area limits generalizability

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