

# A Cross-sectional study to assess Morbidity patterns among Primary school children in Urban and Rural areas of District Gautam Buddha Nagar

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## ARTICLE CYCLE

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## ABSTRACT

**Background:** Morbidity among primary school children is a significant public health concern, with patterns varying across urban and rural settings due to socio-economic, environmental, and lifestyle factors. **Aim & objectives:** To assess and compare the prevalence and pattern of morbidities and to assess the nutritional status among primary school-going students in urban and rural regions of District Gautam Buddha Nagar, Uttar Pradesh. **Methodology:** A cross-sectional study was conducted from March to May 2024 at four randomly chosen government primary schools—two each from urban and rural areas. All students from classes I–V who attended the health camp on the day of the health camp, with parental consent, were examined. A pre-tested, semi-structured questionnaire was used to gather information on sociodemographic characteristics and morbidity trends. SPSS v22.0 was used for the statistical evaluation. **Results:** Of 303 participants (119 rural, 184 urban), overall morbidity prevalence was high in both groups (80.67% rural; 83.70% urban). Gastrointestinal (48.73%) and ocular morbidities (55.46%) were significantly more prevalent among rural primary school children, whereas dental (36.95%) and ear morbidities (34.23%) were more commonly observed in their urban counterparts. Respiratory, throat, nose morbidities, and micronutrient deficiencies showed no significant differences. Nutritional assessment revealed a higher Prevalence of underweight (20.16%) and stunting (46.21%) in rural children, indicating chronic nutritional deprivation **Conclusion:** The study highlights distinct morbidity profiles between rural and urban primary school children, underscoring the need for tailored school health programs focusing on preventable conditions such as ocular, dental, gastrointestinal, and nutritional problems.

## KEYWORDS

Morbidity patterns, Primary school children, School health, Nutritional status, Urban-Rural difference.

## INTRODUCTION

The future of the country is dependent on the health of its children, who are the backbone of a healthy nation. UNESCO Institute for Statistics (UIS) reports classify primary-school-age children as approximately 6–11 years, lower secondary as 12–14 years, and upper secondary as 15–17 years.(1). About 25% of India's population is schoolchildren. (2) Childhood morbidity among primary school-aged children remains a pressing public health concern globally. It is especially noticeable in

countries with low to middle incomes, wherein malnutrition and infectious illnesses are pervasive. The World Health Organization reports that, despite substantial reductions in child mortality since 1990, morbidity continues to persist as a major barrier to children's health, especially in resource-limited settings(3,4). Global data indicate a high burden of common morbidities among school-age children—including dental caries, micronutrient deficiencies, hearing disorders, and vision problems—with the greatest burden in low-

and middle-income countries.(4). Dental problems are widespread, with the prevalence of dental caries reaching over 20% in some studies(5,6). There is a high burden of respiratory and gastrointestinal illnesses among children in India, with diarrhoea and pneumonia remaining the leading causes of morbidity and mortality; poor WASH access contributes substantially. National surveys consistently show higher rates of undernutrition and anaemia in rural children than in urban children. Soil-transmitted helminth infections disproportionately affect populations with inadequate WASH, including school-age children.(7,9,10). With the above background, A research contrasting the morbidity patterns and prevalence among students of primary school in urban and rural settings of District Gautam Buddha Nagar was carried out.

**Aim & Objective(s):**

- To assess the prevalence of morbidities among primary school-going children in urban and rural areas of District Gautam Buddha Nagar.
- To compare the morbidity patterns among primary school-going children in urban and rural areas of District Gautam Buddha Nagar.
- To assess the nutritional status among primary school-going children in urban and rural areas of District Gautam Buddha Nagar.

**MATERIAL & METHODS**

**Study Design:** A cross-sectional study has been carried out in government primary schools.

**Study Area and Setting:** Study was conducted in both rural and urban fieldwork areas of a Medical College in District Gautam Buddha Nagar, Uttar

Pradesh. The investigation was carried out over the course of three months, from March 2024 to May 2024. There were a total of ten government primary schools in the field practice area: four in the urban area and six in the rural area. The simple random sampling method was used to choose four schools, two from each of the urban and rural regions.

**Inclusion Criteria:** All the students enrolled in Grades I to V who were present on the day of the visit and whose parent or legal guardian had given written informed consent were included in the study.

**Exclusion Criteria:** Students whose parents didn't gave consent.

**Ethical Clearance:** The study proposal was cleared by the Institutional ethical Committee (IEC).

**Data Collection:** A previously tested semi-structured questionnaire was used to gather data in order to record sociodemographic information and evaluate the children's morbidity trends. GIT and Respiratory Problems were assessed based on the past 15-day history. Nutritional status of children aged 5–11 years were assessed using the WHO Growth Reference for 5–19 years. Stunting, defined as low height for age, classified as a Height-for-Age Z-score (HAZ) < -2 SD, and severe stunting as HAZ < -3 SD. Underweight, defined as low body weight for age classified as a Weight-for-Age Z-score (WAZ) < -2 SD, and severe underweight as WAZ < -3 SD.

Thinness was defined as BMI-for-Age Z-score (BAZ) <-2 SD and severe thinness as BAZ <-3 SD, while overweight and obesity were classified as BAZ > +2 SD and > +3 SD, respectively. The collected data were entered and analyzed using SPSS software version 22.0. The Chi-square test was applied to assess the association between variables.(29)

**RESULTS**

**Table 1: Distribution of study subjects based on Socio-Demographic characteristics**

		Rural N=119 (%)	Urban N=184 (%)
<b>Age</b>	6-8 Years	38 (31.93)	73 (39.67)
	9-11 Years	49 (41.17)	104 (56.52)
	12 Years and above	32 (26.89)	7 (3.84)
<b>Gender</b>	Male	57 (47.9)	87 (47.3)
	Female	62 (52.1)	97 (52.7)
<b>Religion</b>	Hindu	119 (100)	155 (84.2)
	Muslim	0 (0.00 )	29 (15.8 )
<b>Type Of Family</b>	Nuclear	76 (63.9 )	133 (72.4 )
	Joint	24 (20.2 )	13 (7.1 )
	Three Generation	19 (16.0 )	38 (20.7 )
<b>Socio-Economic Status (According to Modified BG Prasad Scale-2025)</b>	Upper Middle	9 (7.6)	13 (7.1)
	Lower Middle	49 (41.2)	116 (63)
	Upper Lower	51(42.9)	55 (29.9)
	Lower	10 (8.4)	0 (0.0)

This study was done on school children from classes 1 to 5 in the urban as well as rural parts within the

Gautam Buddha Nagar district. Table 1 shows that the majority of the students were between the ages

of nine and eleven, i.e., 41.17 % in rural areas and 56.52 % in urban areas. There were slightly more girls than boys in the study, and most of the children were Hindus. Nearly two-thirds of the children in rural areas and more than two-thirds in urban areas lived in nuclear families. According to the Modified BG Prasad Scale 2025, the majority of children in rural areas belonged to the upper lower (42.9%)

socio-economic class, while in urban areas, most children were from the lower middle class (63%). According to our survey, 80.67% of primary school students in rural regions and 83.7% of students in urban regions had one or more morbidities reflecting a high prevalence of health problems among children in both groups. Although the proportion was slightly higher in urban areas.

**Table 2: Association of Morbidities among study participants with their area of residence**

Morbidities		Rural N=119 (%)	Urban N=184 (%)	Total N=303 (%)	P-value
<b>GIT Problems</b>	Present	58 (48.73)	45(24.45)	103(33.99)	0.0001
	Absent	61(51.26)	139(75.54)	200(66.00)	
<b>Respiratory Problems</b>	Present	42(35.29)	54(29.34)	96(31.68)	0.337.
	Absent	77(64.70)	130(70.65)	207(68.31)	
<b>Ear Morbidities</b>	Present	26(21.84)	63(34.23)	89(29.37)	0.21
	Absent	93(78.15)	121(65.76)	214(70.62)	
<b>Dental Problems</b>	Present	17 (14.28)	68 (36.95)	84(27.72)	0.0001
	Absent	102(85.71)	117(63.58)	219(72.27)	
<b>Ocular Morbidities</b>	Present	66 (55.46)	6(3.26)	72(23.76)	0.0001
	Absent	53(44.53)	178(96.73)	231(76.23)	
<b>Micronutrient Deficiencies</b>	Present	23 (19.32)	25 (13.58)	48 (15.84)	0.498
	Absent	96 (80.68)	159 (86.41)	255(84.15)	
<b>Throat Morbidities</b>	Present	15(12.60)	22(11.95)	37(12.21)	0.866
	Absent	104(87.39)	162(88.04)	266(87.78)	
<b>Nasal Morbidities</b>	Present	7(5.88)	5(2.71)	12(3.96)	0.168
	Absent	112(94.12)	179(97.28)	291(96.03)	

Table 2 depicts the distribution of morbidities among school children, which revealed distinct urban–rural differences. Compared to urban regions (24.45%), gastrointestinal issues were substantially more common in rural areas (48.73%). Respiratory problems were common in both groups (35.29% in rural and 29.34% in urban), but the variation was not significant. Dental morbidities, however, were more prevalent in urban children (36.95%) than in rural children (14.28%), and this difference was statistically significant. Similarly, ear morbidities were more frequent among urban children (34.23%) compared to rural children

(21.84%), though the difference was not statistically significant.

Ocular morbidities showed a contrasting pattern, being reported predominantly in rural children (55.46%) compared to only 3.26% in urban children, with the difference being statistically significant. Micronutrient deficiencies were observed in both groups, with a slightly higher proportion in rural children (19.32%) than in urban children (13.58%), though this difference was not statistically significant. Throat and nasal morbidities were relatively low in both groups and showed no significant variation between rural and urban children.

**Table 3: Association of Nutritional status among study participants with their area of residence.**

		Rural, N=119(%)	Urban, N=184(%)	Total N=303 (%)	p-value
<b>BMI for age</b>	Severe Thinness	7 (5.88)	20 (10.86)	27(8.91)	0.529
	Thinness	31 (26.05)	39 (21.19)	70(23.1)	
	Overweight	1 (0.84)	1 (0.54)	2(0.66)	
	Normal	80 (67.22)	124 (67.39)	204(67.32)	
<b>Underweight</b>	Present	24 (20.16)	23 (12.5)	47(15.51)	0.101
	Absent	95 (79.83)	161 (87.5)	256(84.48)	
<b>Stunting</b>	Present	55 (46.21)	28 (15.21 )	83(27.39)	<0.0001
	Absent	64 (53.78)	156 (84.78 )	220(72.60)	

Table 3 depicts the nutritional status of the study population, assessed by BMI-for-age, underweight,

and stunting, revealed notable urban–rural differences. Among rural children, 5.88% had

severe thinness and 26.05% had thinness, compared to 10.86% and 21.19%, respectively, in urban children; nevertheless, there was no statistically significant difference. Overweight was observed rarely in both groups (0.84% in rural and 0.54% in urban), while the majority of children were in the normal BMI range (67.22% in rural and 67.39% in urban).

Underweight was observed more frequently among rural children (20.16%) than urban children (12.5%), although this difference was not statistically significant. In contrast, stunting demonstrated a significant disparity, with a much higher prevalence in rural children (46.21%) compared to their urban counterparts (15.21%), indicating a substantial burden of chronic undernutrition in rural areas.

## DISCUSSION

The current study was carried out with students in government primary schools (classes 1st to 5th) in both urban and rural areas of Gautam Buddha Nagar district and revealed significant variations in morbidity patterns between the two populations. Ear morbidities were more prevalent among urban children (34.23%) compared to rural children (21.84%). This finding is consistent with the observations of Prakash Chandra Gupta (14), who reported a 30% prevalence of ear morbidities in rural areas, and Vidya Rani (11), who documented wax in the ear in 33.91% of rural children. Nasal morbidities were slightly higher in rural children (5.88%) compared to urban children (2.71%). Similar results were documented by Sheetu Singh *et al.* (12), who noted that 11.3% of students ages 6-7 had allergic rhinitis, and by D. Chandrika (13) in Karnataka, who reported 12.5% of students just had nose related symptoms of the same age group. Throat problems were observed in 12.60% of urban and 11.95% of rural children. Comparable results were reported by Viral Shah (14) in Jamnagar, who found throat morbidities in 10% of school children, and by Siva Kumar (15) in Pondicherry, who reported Group A Streptococci-positive throat cultures in 14.2% of children.

Ocular morbidities were markedly higher in rural children (55.46%) compared to urban children (3.26%). Similar findings were reported by Palash Das (16), who observed a prevalence of 5.9% in an urban area of North Kolkata, and by Sana Javeriya (17), who found a prevalence of 2.33% in urban Aurangabad, consistent with the lower prevalence observed in urban areas in our study. Dental morbidities were more common in urban children (36.95%) than in rural children (14.28%). A. Hiremath (18) reported a much higher prevalence of dental caries (78.9%), which may be attributed to geographical and dietary variations, while MD

Kathariya (19) reported dental anomalies in 25.8% of children, comparable to our findings.

Micronutrient deficiencies, including anemia, were observed in 19.32% of rural and 13.58% of urban children. HP Bharati (20) reported a higher prevalence of 35% in rural areas, which may be due to socioeconomic and parental awareness differences.

Variations in nutritional status were also observed. Stunting was considerably more common in rural students (46.21%) than their urban counterparts (15.21%), and underweight was found to be greater in rural students (20.16%) than in urban students (12.5%). Similar trends were noted by A. Osei (21), who reported underweight and stunting in 60.9% and 56.1% of children in Garhwali Himalayan villages, and by P. Verma (22), who found stunting in 43.4% and underweight in 35.5%. The differences may be attributed to parental education, nutritional practices, and socioeconomic factors. Thinness was more common among rural children (26.05%) compared to urban children (21.19%). GC Mandal (23) and Subal Das (24) reported much higher prevalence rates in West Bengal (75.95% and 77.6%, respectively), likely due to regional dietary and economic disparities.

Gastrointestinal problems were reported in 48.73% of rural children and 24.45% of urban children. Sarkar M. (25) documented a similar prevalence, with diarrhoea affecting 56.73% of school children in Kolkata. In contrast, Singh SK (26) reported a lower prevalence of 29% in Jaunpur district, which is comparable to the urban prevalence found in our study.

Respiratory problems were observed in 35.29% of rural children and 29.24% of urban children. These findings are in line with the study by Mhaske MS (27), who reported upper respiratory tract infections in 38.2% of students, and Saini A. (28), who noted a prevalence of acute respiratory infections in 33.52% of school children in Jaipur.

## CONCLUSION

The present study, conducted among students of classes 1 to 5 in both rural and urban areas of Gautam Buddha Nagar district, highlights significant differences in morbidity patterns between the two settings.

Although the overall prevalence of morbidity was high in both groups, distinct urban-rural differences were observed. Gastrointestinal problems, ocular morbidities, underweight, and stunting were significantly more prevalent among rural children, indicating a greater burden of chronic undernutrition and environmental health challenges in rural areas. In contrast, dental and ear morbidities were more common among urban

children. Stunting showed a statistically significant higher prevalence in rural children, reflecting persistent chronic nutritional deprivation. These findings emphasize the need for area-specific school health interventions focusing on nutrition, WASH practices, and early detection of common morbidities. That's why schools should have good health programs to help find, prevent, and treat common health problems in children early.

#### RECOMMENDATION

Regular school health screening and early referral services should be strengthened to detect and manage common morbidities among primary school children. Targeted nutritional interventions and improved WASH practices, especially in rural areas, are necessary to address the high prevalence of stunting and gastrointestinal illnesses. Urban schools should emphasize dental and ENT screening services.

#### LIMITATIONS OF THE STUDY

The study was conducted only in selected government schools, which may limit the generalizability of the findings to private schools or other regions. Additionally, the relatively short duration of the study (three months) may not adequately capture seasonal variations in morbidity patterns.

#### RELEVANCE OF THE STUDY

The study demonstrates a high burden of morbidity and significant rural–urban disparities among primary school children. The findings provide evidence for developing area-specific, school-based public health interventions aimed at reducing preventable diseases and improving child health outcomes.

#### AUTHORS CONTRIBUTION

RC: Contributed to the conception and design of the study, data collection, statistical analysis, and drafting of the manuscript. NT: Contributed to the conception and design of the study, statistical analysis, interpretation of results and drafting of the manuscript. ASP: Design of the study, and drafting of the manuscript, AS: Design of the study, and drafting of the manuscript. HM: Assisted in interpretation of results, and manuscript review. SS: Provided overall supervision, guidance, and critical revision of the manuscript. , All authors read and approved the final manuscript.

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#### CONFLICT OF INTEREST

NIL

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**DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS:** NO AI TOOL WERE USED IN THE CONCEPTUALIZATION, DATA ANALYSIS, OR WRITING OF THIS MANUSCRIPT.

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