Section: Community Medicine

Original Research Article

EXAMINING THE INFLUENCE OF SOCIOECONOMIC FACTORS ON CHILDHOOD OBESITY RATES IN URBAN VS. RURAL COMMUNITIES: AN OBSERVATIONAL STUDY

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ABSTRACT

Background: Childhood obesity is a global health challenge. Socioeconomic factors play a significant role in influencing obesity rates, with distinct variations observed between urban and rural communities. **Objective:** To investigate the influence of socioeconomic factors on childhood obesity rates in urban versus rural communities using an observational approach.

Material and Methods: The study sampled 100 children aged 5-15 years, equally divided between urban and rural areas. Childhood obesity prevalence was determined through BMI classification. Data on socioeconomic status (SES), parental education levels, access to nutritional food, and physical activity levels were collected through questionnaires and surveys. Descriptive statistics were used to identify correlations between these factors and obesity prevalence.

Results: Obesity Prevalence: Urban children had a higher obesity prevalence (36%) than rural children (28%). Socioeconomic Status: In urban communities, children from lower SES households had a 40% obesity rate compared to 32% in higher SES households. In rural communities, these rates were 36% (lower SES) and 20% (higher SES). Parental Education Levels: Urban children with parents having a high school education or less had a 45% obesity prevalence versus 20% for those with college-educated parents. In rural communities, these rates were 32% and 25%, respectively. Nutritional Food Access: Urban children with limited access to nutritional food had a 40% obesity prevalence compared to 24% for those with good access. Physical Activity Levels: Urban children with less than 60 minutes of daily activity had a 48% obesity prevalence versus 28% for those exceeding 60 minutes. Rural communities showed similar trends.

Conclusion: The study highlights the significant impact of socioeconomic factors on childhood obesity rates. Tailored interventions addressing SES disparities, education, food access, and physical activity are crucial for managing obesity in urban and rural settings.

Keywords: Childhood obesity, socioeconomic status, parental education, nutritional access, urban-rural comparison.

INTRODUCTION

Childhood obesity is an escalating global health issue, affecting millions of children worldwide.[1,2] It is a significant public health concern due to its long-term consequences, such as an increased risk of developing type 2 diabetes, cardiovascular diseases, and other metabolic disorders. Moreover, childhood obesity often persists into adulthood, leading to

further health complications and reduced quality of life.[3,4]

The prevalence of childhood obesity is known to be influenced by a variety of factors, including genetics, diet, physical activity levels, and, notably, socioeconomic status (SES).[5] SES encompasses a range of factors such as household income, parental education, and access to healthcare, all of which shape dietary habits, opportunities for physical activity, and general lifestyle choices.[6] These factors often differ between urban and rural communities, leading to distinct disparities in childhood obesity rates.[7]

Urban communities typically have a higher concentration of fast-food outlets and a more sedentary lifestyle, while rural communities may have limited access to healthcare and nutritional food options8. Parental education levels and income can also vary significantly, influencing health knowledge and access to health resources. Understanding how these socioeconomic factors interact and differ between urban and rural environments is essential for designing effective, tailored interventions to address childhood obesity.

This study aims to analyze the influence of socioeconomic factors on childhood obesity rates in urban versus rural communities. By exploring the relationships between SES, parental education, access to nutritional food, physical activity levels, and childhood obesity prevalence, this research seeks to provide insights into developing specific strategies to combat this growing health crisis.

MATERIAL AND METHODS

Study Period and Setting

This observational study was conducted between July 2023 and December 2023 at the Government Medical College, Srikakulam.

Study Design

A cross-sectional observational design was used to examine the prevalence of childhood obesity in relation to socioeconomic factors in both urban and rural communities.

Sample Size and Sampling Method

A total of 100 children, aged 5-15 years, were selected for the study. They were equally divided into two groups, with 50 participants from urban areas and 50 from rural areas. A stratified random sampling method was used to ensure representative samples across socioeconomic strata.

Data Collection Instruments

Questionnaire: A structured questionnaire was developed to collect data on socioeconomic status (SES), parental education levels, access to nutritional food, and physical activity levels.

Anthropometric Measurements: Body mass index (BMI) was calculated using height and weight measurements to classify participants according to the World Health Organization's growth standards.

Variables and Definitions

Socioeconomic Status (SES): SES was categorized into higher or lower groups based on household income and parental occupation.

Parental Education Levels: Classified into two categories—high school education or less, and college degree or higher.

Nutritional Food Access: Participants were asked about their proximity to grocery stores and availability of healthy food options. Access was categorized as limited or good.

Physical Activity Levels: Participants were asked to self-report their daily physical activity, categorized as less than or more than 60 minutes per day.

Data Analysis

Descriptive statistics were used to calculate the prevalence rates of obesity. Comparative analyses were conducted using obesity prevalence across urban and rural groups, SES categories, parental education levels, nutritional food access, and physical activity levels. Statistical differences between groups were assessed using chi-square tests with a significance level of $p < 0.05$. The results were then summarized and presented in tables to highlight key findings.

Ethical Considerations

The study was conducted in accordance with ethical guidelines and standards. Informed consent was obtained from all participants. The study protocol was reviewed and necessary prior permissions taken from concerned authorities.

RESULTS

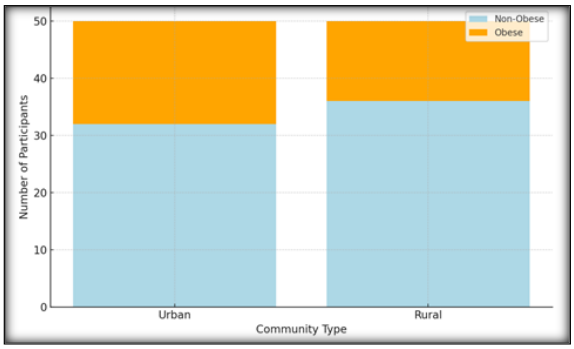

Figure 1: Childhood Obesity Prevalence in Urban vs. Rural Communities

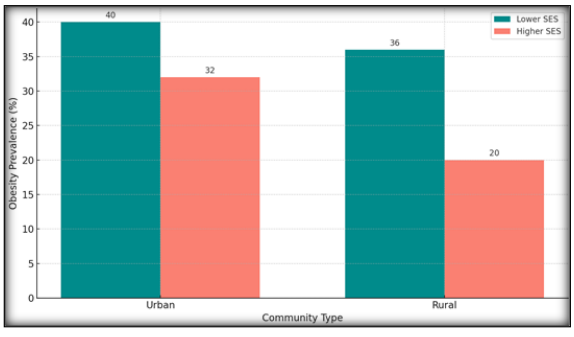

Figure 2: Obesity Prevalence by Socioeconomic Status in Urban and Rural Communities

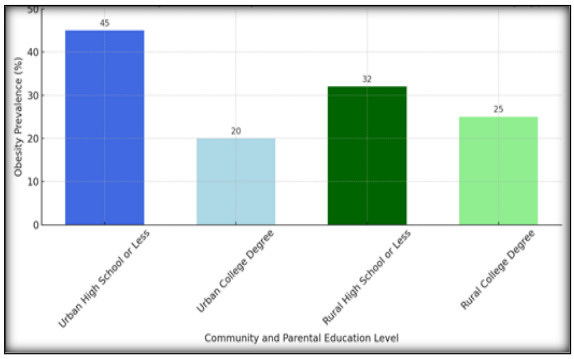

Figure 3: Childhood Obesity Prevalence by Parental Education Level and Community Type

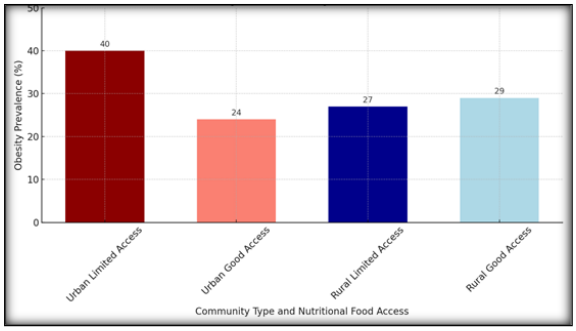

Figure 4: Childhood Obesity Prevalence by Nutritional Food Access

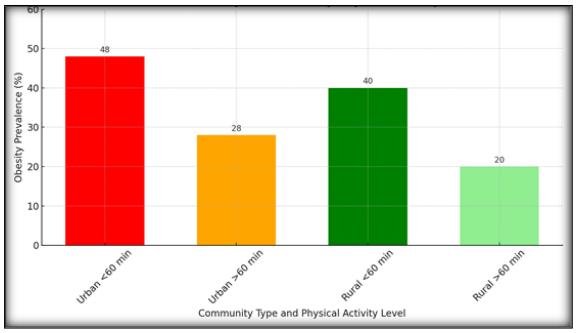

Figure 5: Childhood Obesity Prevalence by Physical Activity Level

The observational study included 100 participants, divided equally between urban and rural communities. The analysis reveals significant differences in childhood obesity rates and the factors influencing them.

Childhood Obesity Prevalence

Table 1 shows a higher prevalence of obesity among children in urban communities (36%) compared to those in rural areas (28%). These differences emphasize the distinct environmental and lifestyle factors impacting children in varying geographic settings.

Socioeconomic Status (SES)

As outlined in Table 2, socioeconomic status (SES) has a considerable influence on childhood obesity rates. In urban communities, children from lower SES households have a significantly higher obesity prevalence (40%) compared to those from higher SES households (32%). Similarly, in rural communities, children from lower SES households exhibit a 36% obesity rate, while those from higher SES households have a 20% rate.

Parental Education Levels

Parental education levels correlate strongly with childhood obesity rates. Table 3 shows that children from urban families with parents who have only high school education or less have an obesity prevalence of 45%, while those with college-educated parents exhibit a lower rate of 20%. In rural communities, similar trends are seen, though less pronounced, with high school or less-educated parents' children at a 32% prevalence and college-educated parents' children at a 25% prevalence.

Access to Nutritional Food

Access to nutritional food affects childhood obesity rates, particularly in urban settings. According to Table 4, urban children with limited access to nutritional food have an obesity prevalence of 40%, compared to 24% among those with good access. In rural settings, the difference is less substantial but still noticeable, with obesity prevalence rates of 27% and 29%, respectively, for children with limited and good access.

Physical Activity Levels

Physical activity levels significantly impact obesity rates (Table 5). Urban children who engage in less than 60 minutes of daily activity have a 48% obesity prevalence compared to 28% for those who engage in more than 60 minutes daily. Rural children exhibit similar trends, with a 40% prevalence among those less active and 20% among those more active.

Table 1: Childhood Obesity Prevalence in Urban vs. Rural Communities

Community Type	Number of Participants	Number of Obese Participants	Obesity Prevalence (%)
Urban	50	18	36
Rural	50	14	28

Table 2: Socioeconomic Status and Childhood Obesity Prevalence

Community Type	SES Category	Number of Participants	Obese Participants	Obesity Prevalence (%)
Urban	Lower SES	25	10	40
Urban	Higher SES	25	8	32
Rural	Lower SES	25	9	36
Rural	Higher SES	25	5	20

Table 3: Parental Education Levels and Childhood Obesity Prevalence

Community Type	Parental Education Level	Number of Participants	Obese Participants	Obesity Prevalence (%)
Urban	High School or Less	20	9	45
Urban	College Degree	30	6	20
Rural	High School or Less	22	7	32
Rural	College Degree	28	7	25

Table 4: Access to Nutritional Food and Childhood Obesity Prevalence

Community Type	Nutritional Food Access	Number of Participants	Obese Participants	Obesity Prevalence (%)
Urban	Limited Access	25	10	40
Urban	Good Access	25	6	24
Rural	Limited Access	26	7	27
Rural	Good Access	24	7	29

Table 5: Physical Activity Levels and Childhood Obesity Prevalence

Community Type	Physical Activity Level	Number of Participants	Obese Participants	Obesity Prevalence (%)
Urban	Less than 60 minutes/day	21	10	48
Urban	More than 60 minutes/day	29	8	28
Rural	Less than 60 minutes/day	20	8	40
Rural	More than 60 minutes/day	30	6	20

DISCUSSION

The results of this observational study highlight key differences in childhood obesity prevalence between urban and rural communities and identify significant socioeconomic factors influencing these rates. The findings highlights that while obesity is a multifaceted issue affecting both settings, the prevalence of obesity is higher in urban areas (36%) compared to rural areas (28%). This discrepancy can be attributed to several distinct factors present in urban settings, such as increased access to fast food, a more sedentary lifestyle, and greater income inequality.[9]

Socioeconomic Status (SES)

In both urban and rural communities, children from lower SES households had higher obesity rates compared to those from higher SES households. This finding is consistent with previous studies demonstrating that lower SES often correlates with poorer access to healthcare, nutritional foods, and safe recreational spaces. In urban areas, high-density living and economic constraints may exacerbate unhealthy eating and physical inactivity. In rural areas, low-income families may face challenges in accessing healthcare and healthy foods due to limited availability and higher costs.[10,11]

Parental Education Levels

Parental education levels significantly influenced childhood obesity rates in both urban and rural areas. Parents with higher education levels are generally more health-conscious, understand the importance of balanced nutrition, and can access healthcare resources more effectively. Children from families where parents had only high school education or less had markedly higher obesity prevalence.[12,13]

Access to Nutritional Food

Urban children with limited access to healthy foods had a significantly higher obesity rate compared to those with good access. This pattern was also evident in rural areas, although the disparity was less pronounced. In urban areas, the prevalence of fast-food outlets and limited access to affordable grocery stores is a known factor contributing to poor dietary habits. In rural regions, while fresh produce may be more accessible in some cases, overall access to varied nutritional options remains a challenge.[14]

Physical Activity Levels

Children in both urban and rural settings who engaged in less than 60 minutes of physical activity per day were more likely to be obese than their more active counterparts. Urban children may face barriers to physical activity due to a lack of safe recreational spaces, while rural children may have fewer organized sports or physical education opportunities.[15]

Limitations

This study is not without limitations. The relatively small sample size may limit generalizability. Self-reported data on physical activity levels could also lead to reporting bias. Furthermore, factors such as genetics and cultural dietary preferences were not comprehensively explored.

CONCLUSION

The study findings highlights the importance of targeted interventions to address childhood obesity, particularly focusing on socioeconomic disparities, education, food access, and physical activity. In urban areas, policy measures should aim to reduce access to unhealthy foods and encourage active lifestyles, while rural interventions should focus on improving access to healthcare and organized

physical activities. A multifaceted approach is crucial for effectively mitigating childhood obesity rates across different settings.

REFERENCES

1. Titis E, Di Salvatore J, Procter R. Socio-economic correlates of childhood obesity in urban and rural England. Public Health Nutr. 2023 Sep;26(9):1815-1827. doi: 10.1017/S1368980023000952. Epub 2023 Jun 5. PMID: 37271723; PMCID: PMC10478054.
2. Lee GY, Um YJ. Factors Affecting Obesity in Urban and Rural Adolescents: Demographic, Socioeconomic Characteristics, Health Behavior and Health Education. Int J Environ Res Public Health. 2021 Mar 1;18(5):2405. doi: 10.3390/ijerph18052405. PMID: 33804550; PMCID: PMC7967724.
3. Lieb DC, Snow RE, DeBoer MD. Socioeconomic factors in the development of childhood obesity and diabetes. Clin Sports Med. 2009 Jul;28(3):349-78. doi: 10.1016/j.csm.2009.02.004. PMID: 19505621; PMCID: PMC5596457.
4. Johnson JA 3rd, Johnson AM. Urban-rural differences in childhood and adolescent obesity in the United States: a systematic review and meta-analysis. Child Obes. 2015 Jun;11(3):233-41. doi: 10.1089/chi.2014.0085. Epub 2015 Apr 30. PMID: 25928227.
5. Okour AM, Saadeh RA, Hijazi MH, Khalaileh HEA, Alfaqih MA. Socioeconomic status, perceptions and obesity among adolescents in Jordan. Pan Afr Med J. 2019 Nov 14; 34:148. doi: 10.11604/pamj.2019.34.148.19641. PMID: 32110265; PMCID: PMC7024107.
6. Alshaikh AA, Alqahtani AS, A AlShehri FA, Al Hadi AM, Alqahtani MMM, Alshahrani OM, Albraik MA, Alamri SA, Ghazy RM. Examining the Impact of Socioeconomic Factors and Lifestyle Habits on Obesity Prevalence Among Male and Female Adolescent Students in Asser, Saudi Arabia. Cureus. 2023 Aug 22;15(8): e43918. doi: 10.7759/cureus.43918. PMID: 37746434; PMCID: PMC10512758.
7. Gülü M, Yapici H, Mainer-Pardos E, Alves AR, Nobari H. Investigation of obesity, eating behaviors and physical activity levels living in rural and urban areas during the covid-19 pandemic era: a study of Turkish adolescent. BMC Pediatr. 2022 Jul 11;22(1):405. doi: 10.1186/s12887-022-03473-1. PMID: 35820871; PMCID: PMC9274641.
8. Montgomery M, Johnson P, Ewell P. A Comparative Analysis of Rural versus Urban Preschool Children's Sugar-Sweetened Beverage Consumption, Body Mass Index and Parent's Weight Status. SAGE Open Nurs. 2022 Mar 9; 8:23779608221082962. doi: 10.1177/23779608221082962. PMID: 35284635; PMCID: PMC8915216.
9. Euler R, Jimenez EY, Sanders S, Kuhlemeier A, Van Horn ML, Cohen D, Gonzales-Pacheco D, Kong AS. Rural-Urban Differences in Baseline Dietary Intake and Physical Activity Levels of Adolescents. Prev Chronic Dis. 2019 Jan 3;16: E01. doi: 10.5888/pcd16.180200. PMID: 30605423; PMCID: PMC6341819.
10. Wang Y, Pan L, Wan S, Yi H, Yang F, He H, Li Z, Yong Z, Shan G. Association of Socioeconomic Status and Overweight/Obesity in Rural-to-Urban Migrants: Different Effects by Age at Arrival. Front Public Health. 2020 Dec 17; 8:622941. doi: 10.3389/fpubh.2020.622941. PMID: 33392144; PMCID: PMC7773929.
11. Sritart H, Taertulakarn S, Miyazaki H. Disparities in Childhood Obesity Prevalence and Spatial Clustering Related to Socioeconomic Factors in Isaan, Thailand. Int J Environ Res Public Health. 2022 Dec 29;20(1):626. doi: 10.3390/ijerph20010626. PMID: 36612948; PMCID: PMC9819306.
12. An R, Yang Y, Hoschke A, Xue H, Wang Y. Influence of neighbourhood safety on childhood obesity: a systematic review and meta-analysis of longitudinal studies. Obes Rev. 2017 Nov;18(11):1289-1309. doi: 10.1111/obr.12585. Epub 2017 Jul 14. PMID: 28707426; PMCID: PMC6059962.
13. Contreras DA, Martoccio TL, Brophy-Herb HE, Horodynski M, Peterson KE, Miller AL, Senehi N, Sturza J, Kaciroti N, Lumeng JC. Rural-urban differences in body mass index and obesity-related behaviors among low-income preschoolers. J Public Health (Oxf). 2021 Dec 10;43(4): e637-e644. doi: 10.1093/pubmed/fdaa162. PMID: 32964933; PMCID: PMC8677588.
14. Dong Y, Ma Y, Dong B, Zou Z, Hu P, Wang Z, Yang Y, Song Y, Ma J. Geographical variation and urban-rural disparity of overweight and obesity in Chinese school-aged children between 2010 and 2014: two successive national cross-sectional surveys. BMJ Open. 2019 Apr 3;9(4): e025559. doi: 10.1136/bmjopen-2018-025559. PMID: 30948583; PMCID: PMC6500219.
15. Li S, Mohamed nor N, Kaliappan SR. Do maternal socioeconomic status influence child overweight? Heliyon. 2024 Jan 12;10(2): e24630.