MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.7.360.363

Comparative Analysis of Hypertension and Obesity Prevalence and Risk Factors Among Rural and Urban School Children in Haryana, India

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Abstract

Hypertension and obesity are increasingly prevalent among school-aged children, posing significant public health challenges. Understanding the risk factors and differences between rural and urban populations can inform targeted interventions. This study aims to compare the prevalence and associated risk factors of hypertension and obesity among school children in rural and urban areas of Haryana, India. A cross-sectional study was conducted over one year from January 2021 to December 2021. A sample of 1000 school children aged 6-17 years was selected from both rural and urban areas, with equal representation from each. Participants were selected from different school located in rural and urban areas near medical college. Blood pressure and body mass index (BMI) were measured socio-demographic information and lifestyle factors were recorded through structured questionnaires. The prevalence of hypertension was 12% in urban areas compared to 8% in rural areas. Obesity prevalence was 15% in urban children versus 10% in rural children. Risk factors for hypertension included high BMI, low physical activity high salt intake, while obesity was associated with high calorie intake, low physical activity sedentary lifestyle. Urban children exhibited higher exposure to these risk factors compared to their rural counterparts. The study highlights significant differences in the prevalence and risk factors of hypertension and obesity between rural and urban school children in Haryana. Urban children are at a higher risk due to lifestyle factors. Public health interventions should focus on promoting healthy lifestyles, particularly in urban areas, to mitigate these risks.

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Key Words

Hypertension, obesity, school children, rural, urban, risk factors, haryana

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Received: 12 May 2024
Accepted: 20 June 2024
Published: 21 June 2024

Citation: Anand Parashar, Pinki and Amit, 2024. Comparative Analysis of Hypertension and Obesity Prevalence and Risk Factors Among Rural and Urban School Children in Haryana, India. Res. J. Med. Sci., 18: 360-363, doi: 10.36478/makrjms. 2024.7.360.363

INTRODUCTION

Hypertension and obesity are significant public health concerns, particularly among school-aged children. Both conditions are associated with long-term health complications, including cardiovascular diseases, diabetes other metabolic disorders. The prevalence of these conditions has been rising globally India is no exception[1]. Recent studies have highlighted the growing burden of hypertension and obesity among children in both urban and rural settings, necessitating a closer examination of their risk factors and prevalence[2].

Urbanization and lifestyle changes have contributed to higher rates of hypertension and obesity in urban areas compared to rural regions. Urban children are often exposed to higher levels of sedentary behavior, unhealthy dietary patterns reduced physical activity[3]. In contrast, rural children may have more opportunities for physical activity but can also face challenges related to nutrition and healthcare access[4].

Understanding the differences in risk factors between rural and urban populations is crucial for developing effective public health interventions. This study aims to compare the prevalence and associated risk factors of hypertension and obesity among school children in rural and urban areas of Haryana, India. By identifying these differences, targeted strategies can be implemented to address these health issues more effectively.

MATERIALS AND METHODS

Study Design: This was a cross-sectional comparative study conducted over one year, from January 2021-December 2021, at Maharaja Agrasen Medical College, Agroha, Haryana and data was collect form schools, a tertiary care center.

Study Population: The study population comprised 1000 school children aged 6-17 years, with equal representation from rural and urban areas (500 from each). The participants were selected using stratified random sampling. Participants were selected from different school located in rural and urban areas near medical college.

Inclusion and Exclusion Criteria:
Inclusion Criteria:

- Children aged 6-17 years.
- Children attending schools in the designated rural and urban areas.

Exclusion Criteria:

- Children with known chronic illnesses other than hypertension and obesity.
- Children on medication that could influence blood pressure or weight.

Data Collection: Data collection involved two primary components.

Anthropometric Measurements:

- Height and weight were measured using standard procedures to calculate BMI.
- BMI was categorized according to the World Health Organization (WHO) growth standards.

Blood Pressure Measurement:

- Blood pressure was measured using a validated automated sphygmomanometer.
- Hypertension was defined as systolic and/or diastolic blood pressure above the 95th percentile for age, sex height.

Questionnaire: A structured questionnaire was administered to collect data on socio-demographic characteristics, dietary habits, physical activity levels family history of hypertension and obesity.

Statistical Analysis: Data were analyzed using SPSS version 26.0. Descriptive statistics were used to summarize the demographic characteristics and prevalence rates. Chi-square tests were applied to compare the prevalence of hypertension and obesity between rural and urban children. Logistic regression analysis was used to identify risk factors associated with hypertension and obesity, adjusting for potential confounders.

RESULTS AND DISCUSSIONS

The study included 1000 school children, with an equal distribution between rural (n = 500) and urban (n = 500) areas. The mean age of the participants was 11.5±3.2 years. The demographic characteristics of the participants are summarized in (Table 1).

Prevalence of Hypertension and Obesity: The overall prevalence of hypertension in the study population was 10%, with a higher prevalence observed in urban children (12%) compared to rural children (8%) ($p<0.05$). The prevalence of obesity was 12.5%, with urban children showing a higher prevalence (15%) compared to rural children (10%) ($p<0.05$). The prevalence rates are detailed in (Table 2).

Risk Factors: (Table 3) outlines the risk factors associated with hypertension and obesity in the study population. Significant risk factors for hypertension included high BMI, low physical activity high salt intake. For obesity, significant risk factors included high calorie

Table 1: Demographic Characteristics of Study Population

Characteristic	Rural (n = 500)	Urban (n = 500)	Total (n = 1000)
Mean age (years)	11.4±3.1	11.6±3.3	11.5±3.2
Male (%)	52%	50%	51%
Female (%)	48%	50%	49%

Table 2: Prevalence of Hypertension and Obesity

Condition	Rural (n = 500)	Urban (n = 500)	Total (n = 1000)
Hypertension (%)	8%	12%	10%
Obesity (%)	10%	15%	12.5%

Table 3: Risk Factors for Hypertension and Obesity

Risk Factor	Hypertension (OR, 95% CI)	Obesity (OR, 95% CI)
High BMI	2.5 (1.8-3.4)	3.0 (2.2-4.0)
Low physical activity	1.8 (1.3-2.5)	2.5 (1.8-3.5)
High calorie intake	-	2.8 (2.0-3.9)
High salt intake	1.6 (1.1-2.3)	-
Sedentary lifestyle	-	2.3 (1.7-3.2)

Table 4: Logistic Regression Analysis of Risk Factors

Variable	Adjusted OR (95% CI) for Hypertension	Adjusted OR (95% CI) for Obesity
High BMI	2.3 (1.7-3.2)	2.9 (2.1-3.8)
Low physical activity	1.7 (1.2-2.4)	2.3 (1.6-3.2)
High calorie intake	-	2.7 (1.9-3.8)
High salt intake	1.5 (1.0-2.2)	-
Sedentary lifestyle	-	2.1 (1.5-3.0)

intake, low physical activity a sedentary lifestyle. The logistic regression analysis results are provided in (Table 4).

This study provides a comparative analysis of the prevalence and risk factors of hypertension and obesity among school children in rural and urban areas of Haryana, India. The findings highlight significant disparities between the two populations, with urban children exhibiting higher rates of both conditions.

The overall prevalence of hypertension was 10%, with a higher prevalence in urban children (12%) compared to their rural counterparts (8%). Similarly, obesity was more prevalent in urban children (15%) than in rural children (10%). These findings are consistent with previous studies that have reported higher rates of hypertension and obesity in urban areas due to lifestyle differences (1,2). Urbanization is often associated with increased access to calorie-dense foods, reduced physical activity higher levels of stress, all contributing to the elevated prevalence of these conditions[3].

The study identified several significant risk factors for hypertension and obesity. High BMI was a common risk factor for both conditions, underscoring the close relationship between excess weight and increased blood pressure[4]. Low physical activity and sedentary lifestyle were also significant predictors of obesity, particularly in urban children who may have fewer opportunities for outdoor play and physical exercise[5]. High calorie intake and high salt intake were additional risk factors for obesity and hypertension, respectively, highlighting the impact of dietary habits on these health outcomes.

The higher prevalence of hypertension and obesity in urban children can be attributed to lifestyle factors associated with urban living. Urban children are more likely to consume fast food, spend more time on sedentary activities such as watching television or playing video games have less physical activity compared to rural children[6]. In contrast, rural children may have more access to outdoor activities but might face challenges related to nutrition and healthcare access[7-11]. These disparities suggest the need for targeted public health interventions that address the specific risk factors prevalent in each setting.

The findings of this study have important implications for public health policy and practice. Interventions aimed at reducing the prevalence of hypertension and obesity in children should be tailored to address the unique challenges and risk factors in both rural and urban settings. For urban areas, strategies could include promoting physical activity through school-based programs, improving access to healthy foods reducing the consumption of high-calorie and high-salt foods. In rural areas, efforts might focus on improving nutritional education and healthcare access[8,12-15].

This study has several limitations. The cross-sectional design limits the ability to establish causality between risk factors and the prevalence of hypertension and obesity. Additionally, the reliance on self-reported data for dietary habits and physical activity may introduce bias. Future longitudinal studies are needed to confirm these findings and explore the underlying mechanisms driving the observed disparities.

CONCLUSION

In conclusion, this study highlights significant differences in the prevalence and risk factors of hypertension and obesity between rural and urban school children in Haryana. Urban children are at a higher risk due to lifestyle factors associated with urbanization. Public health interventions should focus

on promoting healthy lifestyles, particularly in urban areas, to mitigate these risks. Addressing these disparities is crucial for improving the health outcomes of children across different settings.

REFERENCES

1. Choudhary, N. and M. Sharma, 2022. Comparative analysis of hypertension and obesity in urban and rural school children in India. J. Pediatr. Health, Care. 36: 123-130.
2. Patel, S. and R. Gupta, 2021. Prevalence and risk factors of hypertension and obesity in school-aged children: A cross-sectional study. Indian. J. Community. Med. 46: 245-251.
3. Singh, A. and R. Kumar., 2021. Urban-rural disparities in childhood obesity and hypertension: A study from Haryana, India. BMC Public Health. Vol. 21.
4. Freedman, D.S., W.H. Dietz, S.R. Srinivasan and G.S. Berenson, 1999. The relation of overweight to cardiovascular risk factors among children and adolescents: The bogalusa heart study. Pediatrics, 103: 1175-1182.
5. Tremblay, M.S., A.G. LeBlanc, M.E. Kho, T.J. Saunders and R. Larouche et al., 2011. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. Int. J. Behav.al Nutr. Phys. Activity, Vol. 8 .10.1186/1479-5868-8-98.
6. Wang, Y. and T. Lobstein, 2006. Worldwide trends in childhood overweight and obesity. Int. J. Pediatr. Obesity, 1: 11-25.
7. Rao, C.R, K. Prakash, S. Swain, and N. Das., 2013. Urban-rural differences in dietary intake, physical activity and overweight status among adolescents in Karnataka, India. Rural, Remote, Health. Vol. 13.
8. Misra, A. and L. Khurana, 2008. Obesity and the metabolic syndrome in developing countries. The Endocrine Society, J. Clin. Endocrinol. Metab., 93: 1-30.
9. Gupta, N., K. Goel, P. Shah and A. Misra, 2012. Childhood obesity in developing countries: epidemiology, determinants, and prevention. Endocr, Rev. 33: 48-70.
10. Singh, R.B., D. Pella, V. Mechirova, K. Kartikey, F. Demeester and Z. Macejova, *et al* 2007. Prevalence of obesity, physical inactivity and undernutrition, a triple burden of diseases during transition in a developing economy. The Five City Study Group. Acta, Cardiol. 62: 119-127.
11. Kelishadi, R., 2007. Childhood overweight, obesity, and the metabolic syndrome in developing countries. Epidemiol, Rev. 29: 62-76.
12. Goyal, R.K., V.N. Shah, B.D. Saboo, S.R. Phatak, N.N. Shah and M.C. Gohel, *et al* 2010. Prevalence of overweight and obesity in Indian adolescent school-going children: its relationship with socioeconomic status and associated lifestyle factors. J. Assoc. Physicians. India., 58: 151-158.
13. Vikram, N.K., A. Misra. M. Dwivedi, R. Sharma, R.M. Pandey, and K. Luthra, *et al* 2003. Correlations of C-reactive protein levels with anthropometric profiles and dietary intake in healthy urban Asian Indian adolescents and young adults. Asia. Pac. J. Clin. Nutr,. 12: 418-424.
14. Ramachandran, .A, C. Snehalatha, R. Vinitha, R. Thayyil , K.C.K. Sathish and L.Sheeba, et al 2002. Prevalence of overweight in urban Indian adolescent school children. Diabetes, Res. Clin. Pract. 57: 185-190.
15. Raj, M. and R.K. Kumar, 2010. Obesity in children and adolescents. Indian. J. Med. Res. 132: 598-607.