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Original Research Article

A Study on Prevalence of Obesity and Hypertension in Adolescent Children Aged 11 – 15 Years.

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Abstract

Introduction: The escalating prevalence of obesity and hypertension in adolescents aged 11 to 15 years is a global health concern. This study aims to assess their prevalence and potential correlations, crucial for informing interventions to mitigate long-term health risks and promote healthier lifestyles in this vulnerable population.

Methods: This cross-sectional study took place at the Department of Pediatrics, District Government General Hospital, Vijayanagaram. Ethical approval was obtained, and written consent from parents was secured. A sample size of 2854 children, aged 11-15, from Vijayanagaram town, excluding those with chronic illnesses, underwent data collection and analysis using SPSS version 19, employing chi-square test and logistic regression.

Results: Government schools exhibited a higher proportion of male students (18.4%), contrasting with private schools where females predominated (22.6%). Gender distribution disparities were significant. Among 2854 children, 47.5% were above the poverty line, and 55.9% were uneducated. Mean BMI was 17.76 ± 3.013, with 1.9% classified as obese, notably higher in government schools (1.1%). Significant differences were observed between obesity and economic status.

Conclusion: The study highlights the concerning prevalence of obesity and hypertension among adolescents, emphasizing the urgent need for intervention strategies. Disparities in gender distribution, school type, and economic status underscore the multifaceted nature of these health issues.

Keywords: Adolescents, Obesity, Hypertension, Prevalence, Intervention

Introduction

The prevalence of obesity and hypertension (HTN) among adolescents aged 11 to 15 years has become a pressing public health concern worldwide. [1] With sedentary lifestyles, poor dietary habits, and increasing screen time, adolescents are increasingly vulnerable to these conditions, which were once considered primarily adult health issues.

Obesity, defined as excessive fat accumulation leading to adverse health outcomes, has seen a dramatic rise in recent decades. Adolescents grappling with obesity face not only physical health risks but also psychological and social challenges, including stigma and discrimination. [2, 3] Concurrently, HTN, characterized by high blood pressure, is emerging as a significant health threat among adolescents. Once thought to be rare in this age group, HTN now affects a considerable proportion of adolescents, predisposing them to cardiovascular diseases later in life.

Understanding the prevalence and correlates of obesity and HTN in adolescent populations is crucial for developing effective prevention and intervention strategies. [2, 4] By identifying risk factors early and promoting healthy lifestyles, we can mitigate the long-term health consequences associated with these conditions, ultimately fostering healthier futures for our youth. This study aims to assess the prevalence of obesity and HTN among adolescents aged 11 to 15 years, exploring potential correlations between these conditions. By understanding their prevalence and associated factors, we seek to inform targeted interventions to promote healthier lifestyles

and mitigate long-term health risks in this vulnerable population.

Methods

It was a cross section study, conducted in the department of Pediatrics, district government general hospital, Vijayanagaram. Study protocol was approved by the Ethical Committee of the hospital. Written informed consent was taken from the parents. Study was conducted for a period of 1 year, December 2017 to November 2018.

Children of both gender between 11 – 15 years, studying in Vijayanagaram town were included in the research. Children with chronic diseases were not considered. Necessary approvals were obtained from the concern school authorities to conduct the research.

Study was explained to the selected students. After clarifying the doubts, structured questionnaire consisting of the details of children like name, age, gender and so on was given and asked to fill. After this, the weight, height, blood pressure (BP) was measured from the study children. As part of study protocol, if there is any discrepancy, BP was measured 2 more times with a gap of 1 hr and considered to be hypertensive if the values are more.

Sample size was calculated using the formula $4pq/l^2$; here prevalence (P) was taken at 36.7 as per Eshwar TKM et al. [5] report and 1.768 was the precision (d). By including these values, the sample size was calculated to be 2854.

Statistical Analysis: Statistical analysis was conducted by SPSS version 19. Chi-square test and logistic regression were used for the statistical analysis; $P<0.05$ was considered to be statistically significant.

Results

Government schools had more males (18.4%) while private schools had more females (22.6%); gender distribution between the schools was significant (Table 1). Total 1357 (47.5%) children were in above poverty line (APL) and 55.9% (1595) were uneducated. The mean BMI was 17.76 ± 3.013; statistically there was significant difference ($P<0.0001$); 1.9% (55) were categorised to be obese. Among this, 15 (1.1%) were from government schools. Statistically there was significant difference between obesity and economic status.

Table 1: Gender wise distribution in schools; n (%)

Gender	Government	Private	Total
Male	525 (18.4)	818 (28.6)	1343 (47)
Female	877 (30.7)	644 (22.6)	1511 (52.9)
Total	1392 (48.7)	1462 (51.2)	2854 (100)
Statistical analysis	$\Psi^2 = 113.21$; $P < 0.001$		
	Statistically significant		

Discussion:

Childhood obesity and HTN are increasingly prevalent health concerns globally. [6] Childhood obesity, characterized by excessive body fat accumulation, predisposes children to various health risks, including HTN. HTN, or high BP, in children can lead to cardiovascular complications and other serious health issues. Both conditions often stem from sedentary lifestyles, poor dietary habits, and genetic factors. Early detection and intervention are vital to mitigate long-term health consequences and promote healthier outcomes for children. [7]

In this research most (51.2%; 1462) of the study children from private school. In another Indian study also most of study children were reported from private schools. [8] The exact reasons for this were not reported. Currently in this state there were few welfare schemes by the state government in which the money was directly getting deposited in the parents account. So parents are taking admissions in the private schools. Hence more number of children admitted in private schools.

Obesity and overweight prevalence was 5.6% in this study. Whereas it was reported to be 14.97% in Siddiqui et al. [9] report. Thomas UM et al. [10] uncovered that 3.86% of children were classified as obese, while 12.27% fell into the overweight category. The prevalence of overweight among the subjects in the present study exceeded earlier reports, indicating the impact of urbanization on dietary patterns and weight status, particularly among children in major cities.

Total 1511 (52.9%) were girl children and 47% (1343) were male (Table 1); the male female ratio was 0.9. in another Indian study, more girl children were reported. [11= The gender parity index (GPI), representing the ratio of girls' to boys' enrollment, surged from 0.41 and 0.22 in 1950–51 to 1.01 and 0.99 in 2011–12 for children aged 6–10 years and 11–13 years, respectively. [12]

The prevalence of HTN and pre HTN in this study were 1.5% and 1.2%. Whereas the HTN prevalence was reported to be 11.7% by Chadha et al. [13] In another Indian report [14], among the children aged 10

to 12 years, the prevalence of high BP was 35.1% (95% CI: 31.5%-38.9%), while in those 13 years or older, it was 25.1% (95% CI, 22.5%-28.0%). In a meta-analysis of 25 published studies from India, encompassing a total sample size of 27,682 participants, the pooled estimate of high blood pressure prevalence was 7.6% (95% CI, 6.1%-9.1%). [15]

In this study statistically there was no statistical significant difference between obesity and financial status. More obesity was reported in high income category by Anuradha RK et al. [16] In developed nations, children from economically disadvantaged families are assumed to have higher exposure to high-calorie and simple carbohydrate foods due to lower income and limited nutritional knowledge. Conversely, in developing countries undergoing modernization and urbanization, easy access to calorie-dense foods may lead to obesity and related health issues, indicative of economic transition.

The study's limitations include its cross-sectional design, potential selection bias, and reliance on self-reported data, which may limit generalizability. Additionally, the study did not explore potential confounding factors such as dietary habits or physical activity levels.

The study highlights the concerning prevalence of obesity and HTN among adolescents, emphasizing the urgent need for intervention strategies. Disparities in gender distribution, school type, and economic status underscore the multifaceted nature of these health issues.

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