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Review Article

A STUDY OF PREVALENCE AND FACTORS ASSOCIATED WITH OVERWEIGHT AND OBESITY IN SCHOOL CHILDREN

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Abstract

Background: Overweight and obesity are characterized by an abnormal or excessive accumulation of fat that can negatively impact health. Their prevalence is rising globally, affecting nearly every country and age group. Childhood obesity is particularly concerning as it poses future risks for various non-communicable diseases.

Aim and Objective: This study aims to assess the prevalence of and factors associated with overweight and obesity in school-aged children.

Methodology: A total of 550 school children were examined. Data were gathered using a pretested questionnaire that included socio-demographic information, anthropometric measurements, and various risk factors such as screen time, physical activity levels, and junk food consumption. The data were analyzed using appropriate statistical methods.

Results and Discussion: The prevalence of overweight and obesity in the study population was found to be 8.72% and 1.28%, respectively. Both conditions were significantly linked to higher socioeconomic status, excessive screen time (more than 2 hours per day), reliance on vehicles for school commutes, consumption of junk food more than twice a week, and insufficient physical activity (less than 30 minutes per day).

Keyword: overweight, obesity.

Introduction

The global pattern of disease is shifting, especially in low- and middle-income countries, which account for the majority of the world's population. A key aspect of this shift is the rising prevalence of obesity, cardiovascular disease, and diabetes. Among these, obesity has reached epidemic proportions, posed a serious public health concern and contributed to 2.6 million deaths globally each year.[1] Obesity significantly increases the risk of morbidity, mortality, and reduced life expectancy. The last two decades of the 20th century saw a dramatic rise in healthcare costs associated with obesity,

particularly among children and adolescents.

For children and adolescents, overweight and obesity are defined using age- and sex-specific body mass index (BMI) charts. Obesity is defined as a BMI at or above the 95th percentile for age and gender, while overweight is defined as a BMI between the 85th and 95th percentiles, indicating a higher risk for obesity-related health issues.[2] It is estimated that more than 22 million children under the age of five are obese globally, and one in ten children is overweight. The prevalence of childhood obesity varies worldwide, ranging from over 30% in the United States to less than 2% in sub-Saharan Africa. In India, data on childhood obesity is emerging. Studies from Delhi and Chennai show obesity rates of 7.4% and 6.2%, respectively, while a study among adolescent school children in South Karnataka reported an overweight prevalence of 9.9% and obesity prevalence of 4.8%.

The causes of childhood obesity are multifactorial, involving interactions between genetic, neuroendocrine, metabolic, psychological, environmental, and socio-cultural factors. Evidence suggests that both children's and adults' eating habits and physical activity levels are heavily influenced by their social and physical environments. Sedentary behaviours, such as television viewing, have also been linked to childhood obesity, a trend that is increasing rapidly in developing countries. Childhood obesity has numerous psychological, physical, and economic consequences.[3]

It can negatively affect self-esteem, cognitive development, and social interactions. Conditions like type 2 diabetes, hypertension, and high cholesterol, which were once seen mainly in adults, are becoming more common in children as obesity rates rise. Given the challenges in treating obesity in adulthood and the long-term health risks associated with childhood obesity, prevention has become a public health priority. This study was conducted to assess the prevalence of obesity and its contributing factors in school children.

Material and Methods

A community-based cross-sectional study was conducted in Tamil Nadu, involving 550 school-going children.

Inclusion Criteria

1. Children attending school
2. Children whose parents were willing to participate

Exclusion Criteria

1. Children absent on the day of data collection
2. Children whose parents were not willing to participate
3. Children with severe illnesses

The study received approval from the Ethical Committee, and permission was obtained from local school authorities. Prior orientation about the study was provided to the teaching staff, administrative staff, and students. Written consent was obtained from parents after the study was explained to them.

Data collection was carried out using a pretested questionnaire, which covered socio-demographic variables and factors influencing obesity. Anthropometric measurements, including weight and height, were taken during school hours. Parents completed the socio-demographic data, and the children were sent home with a parental form a day before their measurements and interviews.

Children were classified into categories of obese, overweight, normal, and underweight based on their BMI, using the International Obesity Task Force (IOTF) cut-off points. Data were analyzed using appropriate statistical methods.

Results

A total of 550 students were included in the study, with a mean age of 11 ± 1.5 years, ranging from 9 to 14 years. The sample consisted of 60% boys and 40% girls. The majority of students (49.09%) had a normal BMI, while nearly 40% were classified as underweight. According to the International Obesity Task Force (IOTF) criteria, 8.5% of the children were overweight, and 1.3% were obese. Therefore, the prevalence of overweight and obesity in the study population was 8.72% and 1.28%, respectively.

Table 1: Association of risk factors in school children with their BMI

Risk factors		Overweight	Obese	P value
Sex	Female	22	03	>0.05
	Male	27	04	
Age	9-11 years	27	03	>0.05
	12-14 years	21	03	
SES	Higher (I,II)	21	04	<0.05
	Lower (III,IV,V)	27	03	
Physical activity	< 30 mins	30	05	<0.05
	>30 mins	17	01	
TV/ computer /day	>2 hrs	23	05	<0.05
	<2 hrs	25	02	
Junk food /week	>2 times	27	05	<0.05
	<2 times	21	02	

The association of various factors with the BMI of the children studied is shown in table 1. It was observed that although there were more males than females, the gender difference in BMI was not statistically significant. In terms of age distribution, the majority of students were in the 9-12 age group, but again, the difference between age groups in relation to BMI was not statistically significant. A significant association was found between higher socioeconomic status and the prevalence of overweight and obesity among children ($p<0.05$). Children from higher socioeconomic backgrounds were more likely to be overweight or obese.

Transportation to school also showed a significant relationship with BMI. Most of the obese children were those who commuted to school by vehicle rather than walking or cycling, and this difference was statistically significant ($p<0.05$). Physical activity played a protective role against overweight and obesity, with children engaging in more than 30 minutes of physical activity daily showing lower BMI. Conversely, the majority of children in the overweight and obese groups had physical activity levels of less than 30 minutes per day. Screen time also had a significant impact on BMI. Children who spent more than two hours per day watching TV or using a computer had higher BMIs compared to those with less screen time, and this difference was statistically significant ($p<0.05$).Additionally, the frequency of junk food consumption was another key factor. Overweight and obesity were significantly more prevalent among children who consumed junk food more

than twice per week, compared to those with lower junk food intake ($p<0.05$). These findings highlight the role of lifestyle factors in influencing childhood BMI, emphasizing the importance of healthy habits such as regular physical activity and reduced screen time and junk food consumption in preventing childhood obesity.

DISCUSSION

The mean age of the children in the study was 11 ± 1.5 years, with a gender distribution of 60% boys and 40% girls. These findings are consistent with those reported by Premanath et al.[4] in Mysore, where 54.5% of the participants were male and 46.1% were female. The prevalence of overweight among the study population was 8.72%, aligning closely with results from other studies, including Kapil et al. (7.4%), Avula Laxmaiah et al. (7.2%), and Kumar et al. (5.74%).[5,6,7] The prevalence of obesity in this study was 1.28%, which is similar to findings by Mishra A et al. (2.8%), Avula Laxmaiah et al. (1.6%), and Bharati et al. (1.2%).[8] Our study also found that the prevalence of obesity was higher among boys compared to girls, a trend observed in other research, such as Kapil et al., where the prevalence of obesity was 8.3% among boys and 5.5% among girls. Additionally, the highest prevalence of overweight and obesity in our study was seen in the 9-11 age group, which is comparable to the findings of Kapil et al., who reported the highest obesity prevalence in the pubertal age group (10-12 years).

A significant association was found between obesity and children from higher socioeconomic status (SES), consistent with findings by Marwah et al. and Shabana et al. The use of motor vehicles for commuting to school was also significantly linked to overweight and obesity, a result similar to that reported by Avula Laxmaiah in Hyderabad. Physical activity played a key role in influencing BMI, with the majority of overweight and obese children engaging in less than 30 minutes of daily physical activity. This finding mirrors studies by S. Kumar et al. (OR: 2, $P<0.001$) and Kotian et al. (OR: 21.09, 95% CI: 2.77-166.8), which demonstrated a strong association between low physical activity and increased risk of obesity.[9,10]

Television and computer usage also had a significant impact on BMI. Children who spent more than two hours per day watching TV or using a computer had a higher risk of being overweight or obese. These results were consistent with studies by Kuriyan et al. (OR: 19.6, $P<0.001$) and Kotian et al. (OR: 7.3, 95% CI: 3.6-14.66).[11,12] Junk food consumption was another critical factor. In our study, children who consumed junk food more than twice per week had a significantly higher prevalence of overweight and obesity compared to those with less frequent consumption ($p<0.05$). Similar findings were reported by S. Kumar et al. in Davangere, where eating junk food more than twice per week was significantly associated with obesity (OR: 5.6, $P<0.001$).

CONCLUSION

Overweight and obesity in this study were significantly associated with several factors, including higher socioeconomic status, watching TV or using a computer for more than two hours per day, commuting to school by vehicle, consuming junk food more than twice per week, and engaging in less than 30 minutes of daily physical activity.

These findings underscore the importance of promoting healthy lifestyle habits to

combat the growing issue of childhood obesity.

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