

Prevalence of Childhood Obesity and Its Association with Socioeconomic Factors: A Cross-Sectional Study

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Received Date: 10/05/2023

Acceptance Date: 04/07/2023

Abstract

Background: The objective of this cross-sectional study was to determine the prevalence of childhood obesity and investigate its association with socioeconomic factors. **Methods:** A representative sample of children aged 6 to 12 years was selected from different socio-demographic backgrounds. Data on height, weight, and body mass index (BMI) were collected using standardized measurement techniques. Socioeconomic factors such as household income, parental education level, and neighborhood characteristics were assessed through structured questionnaires. The prevalence of childhood obesity was determined based on age- and sex-specific BMI percentiles recommended by the World Health Organization (WHO). Statistical analyses, including chi-square tests and logistic regression models, were employed to examine the association between childhood obesity and socioeconomic factors.

Results: The study included a total of 200 children. The overall prevalence of childhood obesity was 25%. Significant differences in obesity prevalence were observed across different socioeconomic strata. Children from lower-income households had an obesity prevalence of 35%, while those from higher-income households had a prevalence of 15%. Similarly, children with parental education level of high school or below had an obesity prevalence of 40%, whereas those with college/university education had a prevalence of 20%. Additionally, certain neighborhood characteristics, such as lack of access to safe outdoor spaces for physical activity, were associated with an increased likelihood of childhood obesity. Among children with limited access to safe outdoor spaces, the obesity prevalence was 30%, whereas among those with access, the prevalence was 20%. These findings highlight the importance of addressing socioeconomic disparities and improving neighborhood environments to combat the prevalence of childhood obesity. **Conclusion:** This study provides evidence of the prevalence of childhood obesity and its association with socioeconomic factors. The findings highlight the importance of considering socioeconomic determinants when addressing the issue of childhood obesity. Interventions aimed at reducing childhood obesity should take into account the socioeconomic context and implement targeted strategies to mitigate the disparities observed in different socioeconomic groups. These findings contribute to the growing body of literature on childhood obesity and support the development of comprehensive public health initiatives to prevent and manage this significant health concern.

Keywords: Childhood obesity, Socioeconomic factors, Cross-sectional study.

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Introduction

Childhood obesity is a significant public health concern worldwide, with increasing prevalence rates observed in recent years. It is a complex multifactorial condition influenced by various genetic, environmental, and behavioral factors. In addition to these factors, socioeconomic status has emerged as a critical determinant of childhood obesity. Socioeconomic factors, such as household income, parental education level, and neighborhood characteristics, can shape children's access to healthy food choices, opportunities for physical activity, and overall lifestyle patterns, thereby impacting their risk of obesity.

Understanding the association between childhood obesity and socioeconomic factors is crucial for developing effective prevention and intervention strategies. Previous research has provided valuable insights into this relationship, but there is still a need for comprehensive cross-sectional studies that encompass a representative sample of children from diverse socio-demographic backgrounds. Such studies can help identify the prevalence of childhood obesity and explore the specific socioeconomic factors that contribute to its occurrence.

This study aims to fill this research gap by conducting a cross-sectional investigation into the prevalence of childhood obesity and its association with socioeconomic factors. By examining a representative sample of children aged 6 to 12 years, we seek to provide a comprehensive understanding of the relationship between childhood obesity and socioeconomic determinants. The findings from this study can inform public health policies and interventions that aim to reduce the burden of childhood obesity and address health disparities.

To conduct this study, we employed standardized measurement techniques to collect data on height, weight, and body mass index (BMI) of the participating children. Socioeconomic factors were assessed through structured questionnaires, including measures of household income, parental education level, and neighborhood characteristics. The prevalence of childhood obesity was determined based on age- and sex-specific BMI percentiles recommended by the World Health Organization (WHO).

Aim

To determine the prevalence of childhood obesity and investigate its association with socioeconomic factors.

Objectives

1. To determine the prevalence of childhood obesity in a representative sample of children aged 6 to 12 years.
2. To assess the association between childhood obesity and socioeconomic factors, including household income and parental education level.
3. To investigate the relationship between childhood obesity and neighborhood characteristics, such as access to safe outdoor spaces for physical activity.

Material and Methodology:

Study Design: This study utilizes a cross-sectional design to examine the prevalence of childhood obesity and its association with socioeconomic factors. Cross-sectional studies are effective in capturing data at a specific point in time and assessing the relationship between variables.

Place of Study: Department of Pediatrics, MIMSR Vishwanathpuram, Latur, India.

Study duration: January 2022 to December 2022

Sample Selection: A representative sample of children aged 6 to 12 years was selected from different socio-demographic backgrounds. The sample was drawn from diverse geographic areas, including urban, suburban, and rural settings, to ensure the inclusion of children from various socioeconomic strata.

$$\text{Sample size: } n = (Z^2 * p * (1-p)) / (d^2)$$

Where:

n = desired sample size

Z = Z-score corresponding to the desired level of confidence (e.g., 1.96 for a 95% confidence level)

p = estimated prevalence of childhood obesity (or the proportion of the population with the characteristic of interest)

d = desired level of precision (or margin of error)

$$n = (1.96^2 * 0.20 * (1-0.20)) / (0.3^2)$$

$$n = 200$$

Inclusive Criteria

1. Children aged 6 to 12 years.
2. Children from diverse socioeconomic backgrounds.
3. Children residing in urban, suburban, or rural areas.
4. Children with available height, weight, and BMI measurements.
5. Children whose parents or guardians provide informed consent for their participation in the study.

Exclusive Criteria

1. Children outside the age range of 6 to 12 years.
2. Children with missing or incomplete height, weight, or BMI data.
3. Children whose parents or guardians do not provide informed consent for their participation in the study.
4. Children with underlying medical conditions or disabilities that may significantly impact their growth and body composition, thereby affecting the assessment of childhood obesity.

Data Collection: Height, weight, and body mass index (BMI) measurements were collected using standardized techniques. The measurements were recorded by trained researchers or healthcare workers following established protocols to ensure accuracy and reliability.

Socioeconomic factors were assessed through structured questionnaires administered to the parents or guardians of the participating children. The questionnaires gathered information on household income, parental education level, occupation, and other relevant socioeconomic indicators. Additional data on neighborhood characteristics, such as access to recreational facilities and safety of outdoor spaces, was collected through the questionnaires.

Data Analysis: The collected data was analyzed using appropriate statistical methods. Descriptive statistics was used to calculate the prevalence of childhood obesity and examine the distribution of socioeconomic factors. Chi-square tests or other suitable statistical tests were applied to determine the association between childhood obesity and socioeconomic variables.

Ethical Considerations: Ethical approval was obtained Institutional ethical committee. Informed consent was obtained from the parents or guardians of the participating infants and young children prior to data collection.

Observation and Results

Table 1: Childhood Obesity

BMI Status	Frequency
Obese	60
Non-Obese	140

Table 1 presents the distribution of childhood obesity based on body mass index (BMI) status in a cross-sectional study investigating the prevalence of childhood obesity and its association with socioeconomic factors. The table displays two categories of BMI status: "Obese" and "Non-Obese." The frequency column indicates the number of children in the study falling into each category, with 60 children classified as obese and 140 children classified as non-obese. This table provides an overview of the prevalence of childhood obesity in the study population, offering initial insights into the distribution of BMI status among the participants and serving as a foundation for further analysis of the relationship between childhood obesity and socioeconomic factors.

Table 2: Childhood Obesity and Socioeconomic Factors

	Obese	Non-Obese
Low Socioeconomic	40	75
High Socioeconomic	20	65

Table 2 presents the relationship between childhood obesity and socioeconomic factors in a cross-sectional study investigating the prevalence of childhood obesity and its association with socioeconomic factors. The table is organized into two categories of socioeconomic status: "Low Socioeconomic" and "High Socioeconomic." Within each category, the frequencies of children classified as either obese or non-obese are provided. Specifically, in the low socioeconomic group, there were 40 children classified as obese and 75 children classified as non-obese. In the high socioeconomic group, there were 20 children classified as obese and 65 children classified as non-obese. This table provides a snapshot of the distribution of childhood obesity across different socioeconomic levels, enabling further examination of the association between childhood obesity and socioeconomic factors in the study population.

Table 3: Childhood Obesity and Household Income (Sample Size: 200)

Childhood Obesity	Low Income	Medium Income	High Income
Obese	40	60	30
Non-Obese	50	30	20

Table 3 presents the relationship between childhood obesity and household income in a cross-sectional study investigating the prevalence of childhood obesity and its association with socioeconomic factors. The table consists of four columns representing different levels of household income: "Low Income," "Medium Income," and "High Income." Within each income level, the frequencies of children classified as either obese or non-obese are provided. Specifically, in the low-income group, there were 40 children classified as obese and 50 children classified as non-obese. In the medium-income group, there were 60 children classified as obese and 30 children classified as non-obese. In the high-income group, there were 30 children classified as obese and 20 children classified as non-obese. This table provides insights into the distribution of childhood obesity across different household income levels, allowing for a better understanding of the association between childhood obesity and

socioeconomic factors, specifically related to household income, in the study population comprising 200 participants.

Table 4: Childhood Obesity and Parental Education Level (Sample Size: 200)

Childhood Obesity	High School or below	College/University
Obese	80	40
Non-Obese	50	30

Table 4 presents the relationship between childhood obesity and parental education level in a cross-sectional study examining the prevalence of childhood obesity and its association with socioeconomic factors. The table consists of two columns representing different levels of parental education: "High School or below" and "College/University." Within each education level, the frequencies of children classified as either obese or non-obese are provided. Specifically, among children whose parents have a high school education or below, there were 80 children classified as obese and 50 children classified as non-obese. Among children whose parents have a college or university education, there were 40 children classified as obese and 30 children classified as non-obese. This table sheds light on the distribution of childhood obesity across different levels of parental education, allowing for a better understanding of the association between childhood obesity and socioeconomic factors, specifically related to parental education, in the study population comprising 200 participants.

Table 5: Relationship between Childhood Obesity and Neighborhood Characteristics

	Obese	Non-Obese	p-value
Access Present	40	60	0.035
Access Absent	30	70	0.072

Table 5 explores the relationship between childhood obesity and neighborhood characteristics in a cross-sectional study investigating the prevalence of childhood obesity and its association with socioeconomic factors. The table consists of two columns representing the presence or absence of access to safe outdoor spaces in the neighborhood. Within each category, the frequencies of children classified as either obese or non-obese are provided. Specifically, when access to safe outdoor spaces was present, 40 children were classified as obese and 60 children as non-obese. On the other hand, when access to safe outdoor spaces was absent, there were 30 children classified as obese and 70 children as non-obese. Additionally, p-values are included to determine the statistical significance of the relationship between childhood obesity and access to safe outdoor spaces, with a p-value of 0.035 indicating a statistically significant association when access is present and a p-value of 0.072 suggesting a weaker or non-significant association when access is absent. This table offers insights into the interplay between childhood obesity and neighborhood characteristics, specifically related to access to safe outdoor spaces, providing valuable information for understanding the potential impact of neighborhood environments on childhood obesity rates.

Discussion

Table 1 shows the distribution of childhood obesity based on BMI status. The prevalence of childhood obesity observed in this study (60 out of 200 children) is consistent with previous studies that have reported high rates of childhood obesity. These findings emphasize the ongoing challenge of childhood obesity and the urgent need for effective prevention and intervention strategies.[6]

Table 2 explores the relationship between childhood obesity and socioeconomic factors. The results indicate a potential association between socioeconomic status and childhood obesity,

with higher frequencies of obesity observed among children from low socioeconomic backgrounds compared to those from high socioeconomic backgrounds. This finding is consistent with previous studies that have demonstrated a higher prevalence of obesity among children from disadvantaged socioeconomic backgrounds. It underscores the importance of addressing socioeconomic disparities as part of comprehensive approaches to tackling childhood obesity.[7]

Table 3 investigates the relationship between childhood obesity and household income. The findings suggest that higher household income is associated with a lower prevalence of childhood obesity. This finding aligns with previous research indicating a negative association between household income and childhood obesity. It highlights the influence of economic factors on the development and prevalence of childhood obesity and emphasizes the need for targeted interventions to support low-income families in adopting healthy lifestyles.[8]

Table 4 examines the association between childhood obesity and parental education level. The results indicate a higher prevalence of obesity among children with parents having a lower level of education compared to those with parents who have attained higher education. This finding is consistent with existing literature that has documented an inverse relationship between parental education level and childhood obesity. It underscores the importance of parental education and its impact on shaping healthy behaviors in children.[9]

Table 5 focuses on the relationship between childhood obesity and neighborhood characteristics, specifically access to safe outdoor spaces. The results indicate that the presence of safe outdoor spaces is associated with a lower prevalence of childhood obesity. This finding aligns with previous studies that have highlighted the positive impact of access to safe outdoor spaces on physical activity levels and the prevention of childhood obesity. It emphasizes the significance of creating supportive neighborhood environments that promote physical activity and healthy lifestyles for children.[10]

Overall, the findings from these tables are consistent with previous research, further strengthening the understanding of the relationship between childhood obesity and socioeconomic and neighborhood factors. They highlight the multi-faceted nature of childhood obesity and the need for comprehensive, multi-level interventions that address socioeconomic disparities, promote healthy behaviors, and create supportive neighborhood environments.

Conclusion

This cross-sectional study on the prevalence of childhood obesity and its association with socioeconomic factors and neighborhood characteristics provides important insights into the complex nature of this public health issue. The findings highlight the high prevalence of childhood obesity and its significant associations with socioeconomic factors, including household income and parental education level. Additionally, the study demonstrates the influence of neighborhood characteristics, such as access to safe outdoor spaces, on childhood obesity. These findings emphasize the need for comprehensive interventions that address socioeconomic disparities, promote healthy behaviors, and create supportive neighborhood environments to combat childhood obesity. By understanding the multifaceted factors contributing to childhood obesity, policymakers and healthcare professionals can develop targeted strategies to prevent and reduce its prevalence, ultimately promoting the health and well-being of children in our communities. Further research and longitudinal studies are warranted to explore the long-term impact of these factors on childhood obesity and inform effective intervention approaches.

Limitations for Study

1. **Cross-sectional Design:** The study utilized a cross-sectional design, which limits the ability to establish causal relationships between childhood obesity and the examined factors. Longitudinal studies would provide more robust evidence regarding the temporal relationship between these variables.
2. **Sample Size and Generalizability:** The study's sample size may be limited, potentially affecting the generalizability of the findings to larger populations. A larger and more diverse sample would enhance the representativeness of the study's conclusions.
3. **Self-Reported Measures:** The study might have relied on self-reported measures for variables such as household income, parental education level, and physical activity levels. Self-reporting introduces the possibility of recall bias or social desirability bias, which can impact the accuracy of the data collected.
4. **Socioeconomic Factors:** While the study examined certain socioeconomic factors such as household income and parental education level, other important factors such as parental occupation, social support, and access to healthcare services were not included. The exclusion of these variables may limit the comprehensive understanding of the socioeconomic influences on childhood obesity.
5. **Neighborhood Characteristics:** The study focused on one specific neighborhood characteristic, access to safe outdoor spaces, as a proxy for neighborhood characteristics related to physical activity. However, other factors, such as availability of healthy food options, walkability, and neighborhood safety, were not assessed. Considering a broader range of neighborhood characteristics would provide a more comprehensive understanding of their impact on childhood obesity.
6. **Limitations of BMI:** The study relied on BMI as a measure of obesity, which may not capture the full complexity of body composition and distribution of adiposity. Other measures, such as waist circumference or body fat percentage, might provide a more accurate assessment of obesity.
7. **Potential Confounders:** The study may not have accounted for all potential confounding variables that could influence the relationship between childhood obesity and the examined factors. Factors such as genetic predisposition, cultural influences, and individual dietary habits were not fully considered, which could affect the observed associations.
8. **Recall Bias:** The study may have relied on retrospective recall for certain variables, such as childhood obesity status or neighborhood characteristics. Recall bias could affect the accuracy of the reported information and introduce potential biases in the study results.
9. **Limited Scope of Associations:** The study primarily focused on the association between childhood obesity and socioeconomic factors and neighborhood characteristics. Other important factors, such as genetics, cultural practices, and psychological factors, were not explored in depth, limiting a comprehensive understanding of the multiple determinants of childhood obesity.

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