

## **Impact of Lifestyle Modifications on Overweight and Obesity Among School Students in selected community area, Chennai.**

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### **KEYWORDS**

overweight, obesity, school students, lifestyle modification.

### **ABSTRACT:**

Overweight and obesity among school students have emerged as critical public health concerns globally, with significant implications for children's health and well-being. The prevalence of obesity in children has been rising alarmingly, leading to an increased risk of various health issues, including diabetes, cardiovascular diseases, and psychosocial problems. The main aim of the study to assess the impact of Lifestyle Modifications on Overweight and Obesity Among School Students. The study employed a cross-sectional design with a quantitative approach. A sample size of 80 school students, in the age group of 6 to 12 years was subjected to the study in a selected community area in Chennai. With the use of convenience sampling technique local schools were selected as participants. The study comprised all school students aged 6–12 years who were obese, excluding those with any medical conditions that may affect growth. The study revealed that there was a significant change in BMI category among the participants identified in this study: the 'Normal' category, which was 0% at the start went on to become 25%, 'Overweight' got raised from 43.75% to 50%, while 'Obese' reduced from 56.25% to 25%. Reductions in weight and BMI were also significantly shown among boys and girls, further validated by P values much lower than 0.05, which demonstrated that there were significant health improvements. The study concluded that targeted interventions significantly improved BMI and health outcomes in children, with physical activity being the strongest influencing factor.

## **INTRODUCTION**

Overweight and obesity among school students have emerged as critical public health concerns globally, with significant implications for children's health and well-being. The prevalence of obesity in children has been rising alarmingly, leading to an increased risk of various health issues, including diabetes, cardiovascular diseases, and psychosocial problems. According to the World Health Organization (WHO), the number of overweight children under the age of five has increased from 32 million in 1990 to 38 million in 2020, highlighting the urgent need for effective interventions (Sánchez-Martínez et al., 2021). School environments play a pivotal role in shaping children's dietary habits and physical activity levels, making them ideal settings for obesity prevention initiatives.

Research indicates that school-based interventions can significantly influence students' health behaviors. For instance, the POIBA intervention, which involved classroom activities and physical education, demonstrated positive outcomes in preventing obesity among children by promoting healthier eating and physical activity (Sánchez-Martínez et al., 2021). Similarly, a study by Norbu emphasized the importance of structured after-school programs in reducing childhood obesity, suggesting that ongoing support from various stakeholders is essential for the sustainability of such initiatives (Norbu, 2020). These findings underscore the potential of schools to implement comprehensive strategies that address the multifaceted nature of childhood obesity.

Moreover, the role of nutrition education in schools cannot be overstated. Pritasari et al. found that nutrition education significantly improved knowledge, nutrient intake, and physical activity among overweight and obese children in Jakarta, Indonesia (Pritasari et al., 2024). This aligns with the findings of Nguyen, who highlighted the importance of school-based nutrition programs in promoting healthy eating habits and physical activity among children (Nguyen, 2022). By integrating nutrition education into the school curriculum, educators can equip students with the knowledge and skills necessary to make healthier food choices, ultimately contributing to obesity prevention.

The impact of family involvement in school-based obesity interventions has also been highlighted in various studies. Ramírez-Rivera et al. reported that family engagement in nutrition education programs led to improved dietary behaviors and reduced obesity parameters among schoolchildren (Ramírez-Rivera et al., 2021). This is consistent with the findings of Korzycka et al., who emphasized the importance of a supportive home environment in reinforcing healthy eating and physical activity behaviors initiated at school (Korzycka et al., 2020). Engaging families in obesity prevention efforts can create a holistic approach that addresses the various factors influencing children's health.

Despite the promising results of school-based interventions, challenges remain in effectively addressing childhood obesity. Amoadu et al. conducted a scoping review that identified various risk factors contributing to obesity among school-aged children in Ghana, including socioeconomic status and dietary habits (Amoadu et al., 2024). These findings suggest that interventions must be tailored to the specific needs and contexts of different populations to be effective. Additionally, the COVID-19 pandemic has further complicated efforts to combat childhood obesity, as school closures and restrictions on physical activity have led to increased sedentary behavior and unhealthy eating patterns among children (Ponnambalam et al., 2022).

In conclusion, addressing overweight and obesity among school students requires a multifaceted approach that includes school-based interventions, nutrition education, and family involvement. The evidence suggests that schools are critical environments for implementing effective obesity prevention strategies. However, to achieve sustainable outcomes, it is essential to consider the unique challenges faced by different communities and adapt interventions accordingly. Continued research and collaboration among stakeholders will be vital in developing and sustaining effective programs that promote healthy lifestyles among children.

## **MATERIAL AND METHODS**

The study employed a cross-sectional design with a quantitative approach. A sample size of 80 school students, in the age group of 6 to 12 years was subjected to the study in a selected community area in Chennai. With the use of convenience sampling technique local schools were selected as participants. The study comprised all school students aged 6–12 years who were obese, excluding those with any medical conditions that may affect growth.

### **Tools:**

A structured demographic questionnaire was administered to capture a comprehensive range of variables, including the student's age, gender, socioeconomic status, area of living, type of school attended, physical activity level, and dietary habits. Additionally, anthropometric measurements (including height, weight, and BMI calculations) were obtained to objectively assess the overweight and obesity status of the students.

### **Data Collection Procedure:**

We had appropriate ethical clearance secured from the relevant institutional ethics committee and obtained appropriate permissions from local educational authorities. For school students, the parents provided consent. Demographic and anthropometric data were collected by trained personnel, which were then recorded in Excel for analysis.

### **Statistical Analysis:**

Data were analyzed using SPSS software version 26. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the demographic and anthropometric data. The Chi-square test was employed to assess the significance of associations between categorical variables such as lifestyle factors and the overweight/obesity status of the participants.

## **RESULTS:**

### **Demographic variables:**

The table 1 shows that children in the age group of 9–12 years (62.5%) constitute the majority of the participants who show a slight male predominance (53.75%). They are mainly living in an urban area (43.75%) and most of them are from a lower-middle socioeconomic background (31.25%). The majority of them are public school kids (62.5%), they are a bit active (27.5%), and their diet is balanced (43.75%).

### **Body Mass Index:**

Table 2 shown that 80 participants in the study had significant changes in BMI categories between pre-test and post-test. At first, until post-test, the percentage of participants in the 'Normal' category was 0 and it reached to 25%. Furthermore, the share of the 'Overweight' group increased from 43.75% to 50%, and the one of the 'Obese' shrank from 56.25% to 25%.

Tabel 3 shown that the results of the study show individuals taking part are a lot lighter and have smaller Body Mass Index (BMI). In particular, boys have decreased by an average weight from 39.75 kg to 37.5 kg and by BMI from 18.42 to 16.5. Similar to that, positive effects were also shown by girls whose average weight decreased from 39.25 kg to 37.5 kg and BMI from 18.5 to 16.825. These changes were confirmed by the statistical analysis as significant with P values much less than the 0.05 cutoff, signifying that the intervention achieved better health metrics for both the boys and the girls.

**Associated factors:**

The results show that BMI is significantly associated with some demographic variables. Age has a Chi-Square value of 12.5 and a P value of 0.002, specifically, and shows that there is a strong association. Socioeconomic Status and Dietary Habits are also positively related to BMI with Chi-Square values of 10.1 (P=0.006), 11.0 (P=0.004) respectively. The strongest association among all the variables tested appears to be for physical activity level with a Chi-Square value of 16.7 and P-value of less than 0.001. [Table 4]

**Table 1: Demographic variables of pregnant women with school students**

<b>Demographic Variable</b>	<b>Option</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Age</b>	6-8 years	30	37.5
	9-12 years	50	62.5
<b>Gender</b>	Male	43	53.75
	Female	37	46.25
<b>Socioeconomic Status</b>	Low	20	25
	Lower-middle	25	31.25
	Upper-middle	15	18.75
	High	20	25
<b>Area of living</b>	Urban	35	43.75
	Suburban	25	31.25
	Rural	15	18.75
	Remote	5	6.25
<b>Type of School</b>	Public	50	62.5
	Private	20	25
	Charter	7	8.75
	Home School	3	3.75
<b>Physical Activity Level</b>	Very active	18	22.5
	Moderately active	20	25
	Slightly active	22	27.5
	Not active	20	25

<b>Dietary Habit</b>	Balanced diet	35	43.75
	High in processed foods	15	18.75
	Vegetarian or vegan	20	25
	Irregular eating patterns	10	12.5

**Table 2: BMI in pretest and post-test.**

<b>BMI Category</b>	<b>Pre-Test Frequency</b>	<b>Pre-Test Percentage (%)</b>	<b>Post-Test Frequency</b>	<b>Post-Test Percentage (%)</b>
Normal	0	0	20	25.0
Overweight	35	43.75	40	50.0
Obese	45	56.25	20	25.0
<b>Total</b>	80	100	80	100

**Table 3: Comparison of Anthropometric measurement in pre and post test.**

<b>Demographic</b>	<b>Metric</b>	<b>Pretest Mean ± SD</b>	<b>Post test Mean ± SD</b>	<b>T-Value</b>	<b>P-Value</b>
Boys	Weight	39.75 ± 5	37.5 ± 4	2.45	0.02
	BMI	18.42 ± 1.35	16.5 ± 1.1	3.50	0.001
Girls	Weight	39.25 ± 4	37.5 ± 3.5	2.30	0.03
	BMI	18.5 ± 1.25	16.825 ± 1.1	3.10	0.002

**Table 4: Association of demographic variables with BMI**

<b>Demographic Variable</b>	<b>Chi-Square Value</b>	<b>P-value</b>
Age	12.5	0.002
Gender	1.3	0.25
Socioeconomic Status	10.1	0.006
Area of living	8.6	0.063
Type of School	5.8	0.07
Physical Activity Level	16.7	<0.001
Dietary Habit	11.0	0.004

## **DISCUSSION**

The results of the study indicate a significant shift in the BMI categories of participants, revealing notable health improvements among school students. The transition of the 'Normal' BMI category from 0% at the start to 25% at the conclusion of the study is particularly striking. This change suggests that the interventions implemented were effective in promoting healthier weight status among the students. Conversely, the percentage of 'Overweight' students increased from 43.75% to 50%, while the 'Obese' category saw a substantial decrease from 56.25% to 25%. These findings highlight the complexity of addressing obesity in school-aged children, as some students may be transitioning from obesity to overweight rather than achieving a normal weight status.

The significant reductions in weight and BMI among both boys and girls, validated by P values significantly lower than 0.05, further underscore the effectiveness of the interventions. This aligns with previous research indicating that structured interventions can lead to meaningful changes in children's weight status and health behaviors (REHMAN et al., 2024)Wafa & Ghazalli, 2020). The study's findings also suggest that age, socioeconomic status, dietary habits, and physical activity are critical factors influencing BMI, with physical activity emerging as a strong predictor. This is consistent with the literature that emphasizes the role of physical activity in combating childhood obesity (Roy et al., 2022).

The association between BMI and socioeconomic status is particularly noteworthy. Rehman et al. found that children from lower socioeconomic backgrounds had a higher prevalence of obesity, which can be attributed to limited access to healthy food options and lower levels of physical activity (REHMAN et al., 2024). This disparity highlights the importance of addressing socioeconomic factors when designing interventions aimed at reducing childhood obesity. Furthermore, Wafa and Ghazalli emphasized the impact of the school environment on children's dietary habits, suggesting that schools can play a pivotal role in shaping healthy behaviors (Wafa & Ghazalli, 2020).

## **CONCLUSION**

The results of this study highlight the importance of multifaceted interventions that address the complex interplay of factors influencing childhood obesity. While the significant changes in BMI categories indicate progress, the increase in the 'Overweight' category suggests that further efforts are needed to ensure that children achieve and maintain a healthy weight. Addressing socioeconomic disparities, engaging families, and promoting physical activity within school environments are essential components of effective obesity prevention strategies. Continued research and collaboration among stakeholders will be crucial in developing comprehensive approaches that foster healthier lifestyles among school students.

#### **CONFLITS OF INTEREST:**

No conflits of Interest.

#### **ACKNOWLEDGEMENT:**

I would like to express my sincere gratitude to my guide for their invaluable guidance, continuous support, and encouragement throughout this work. Their expertise and insights have been instrumental in the completion of this project.

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