Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 23s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Effectiveness Of Lifestyle Education Programs In Preventing And Managing Childhood Obesity Among School Children

Menaga Gandhi. B[*1], Abirami.M[2]

[*1]Ph.D Scholar, Department of Nursing, Bharath institute of Higher Education and Research, Chennai, Tamil Nadu -600073, India.

[2]Vice Principal, Bharath College of Nursing, Selaiyur, Chennai, Tamil Nadu -600073, India.

***Corresponding Author:**

Menaga Gandhi. B

Cite this paper as: Menaga Gandhi. B, Abirami.M, (2025) Effectiveness Of Lifestyle Education Programs In Preventing And Managing Childhood Obesity Among School Children. *Journal of Neonatal Surgery*, 14 (23s), 39-45.

ABSTRACT

Childhood obesity is increasingly being recognized as a significant public health concern, affecting children and adolescents across various demographics worldwide. The study aimed to evaluate the effectiveness of lifestyle education programs in preventing and managing childhood obesity among school children. The study utilized a quasi-experimental design to assess the effectiveness of a lifestyle education program in preventing and managing childhood obesity among school children. A total of 600 children were screened, and 70 overweight and obese children were selected based on inclusion criteria: children who were overweight or obese (based on BMI) and were willing to participate. Exclusion criteria included children who were unwilling to participate, those with co-morbidities that limited physical activity, or those with medical conditions that affected participation. The study showed that out of 600 children, the majority had normal weight (81.67%), while 6.67% were underweight, 3.33% were overweight, and 8.33% were obese. The combined prevalence of overweight and obesity was 11.67%. After the intervention, significant improvements were observed in health metrics: mean BMI decreased from 25.8 ± 3.5 kg/m² to 24.5 ± 3.2 kg/m² (p=0.003), waist circumference reduced from 85.4 ± 7.8 cm to 82.1 ± 7.2 cm (p=0.008), and body fat percentage dropped from 28.6 ± 5.2% to 26.4 ± 4.7% (p=0.004). All changes were statistically significant, indicating the intervention's positive effect on reducing overweight and obesity prevalence. The study highlighted that the intervention had a positive impact on children's health metrics, with significant reductions in BMI, waist circumference, and body fat percentage.

Keywords: *Lifestyle education, prevention, obesity, school children*

1. INTRODUCTION

Childhood obesity is increasingly being recognized as a significant public health concern, affecting children and adolescents across various demographics worldwide. It is characterized by an abnormal or excessive accumulation of body fat that poses health risks, particularly when it results in a body mass index (BMI) above the normative percentiles for age and sex. The World Health Organization defines childhood obesity as a BMI at or above the 95th percentile for children of the same age and sex. The current prevalence rates demonstrate alarming trends, with approximately 19.7% of children in the United States designated as obese as of 2020. [1]

The prevalence of childhood obesity has escalated into a significant public health crisis globally, necessitating multifaceted interventions that address lifestyle and dietary practices, primarily through the implementation of educational programs. Effective lifestyle education programs are designed to instill healthy dietary habits and promote physical activity among children, thereby curtailing the rising incidence of obesity and its associated health risks. Evidence indicates that such programs are most effective when they are family-oriented, integrating support systems that encourage healthy behaviors in both children and their guardians. [1,2]

Family-based lifestyle interventions have been shown to provide psychological support and practical guidance that are crucial for the sustainable management of childhood obesity. Specifically, education that targets dietary choices, such as reducing consumption of high-calorie, low-nutrient foods—including sugary beverages and fried snacks—while promoting regular physical activity, has been linked with improved health outcomes in pediatric populations. [3,4]

Studies have consistently demonstrated that children whose parents maintain healthy lifestyle practices are at a lower risk of developing obesity. This underscores the necessity for educational programs to not just focus on children's behavior but to also engage and inform parents, ensuring a holistic approach to obesity prevention. [5,6]

Research shows that programs incorporating behavioral therapy components—which address emotional and psychological factors related to eating and physical activity habits—are particularly effective. By fostering an environment that supports motivation and self-efficacy, these programs can propel children toward healthier lifestyle choices. [7,8]

Furthermore, the need for longitudinal studies that examine the long-term impacts of lifestyle education remains evident, as short-term studies may not capture the sustained behavior changes necessary for successfully combating obesity. [9] The intergenerational transmission of obesity-related behaviors presents an additional dimension to consider when developing effective lifestyle education programs. Maternal health behaviors prior to and during pregnancy have been linked to obesity risk in offspring, signifying that educational interventions could effectively target mothers to enact change. [10,11]

Emerging communication technologies, such as mobile health applications and online platforms, offer novel modalities for delivering educational content and engaging families in interactive learning experiences. These tools can facilitate data collection on dietary intake and physical activity levels, allowing for personalized feedback tailored to individual families' behaviors. [12] Such innovations can also contribute to reaching underserved populations and improving accessibility to essential health information, thus reducing disparities in childhood obesity prevalence. [13]

Overall, the effectiveness of lifestyle education programs in preventing and managing childhood obesity lies in their ability to integrate knowledge translation, behavior modification, and emotional support systems into a family-centric model.[14] It is evident that interventions must be culturally sensitive and adaptable to different socio-economic contexts to maximize their reach and impact. [15,16] As the obesity epidemic presents complex challenges, continued research and the development of innovative strategies will be critical to the efficacy of future lifestyle education programs.

The pervasive nature of childhood obesity calls for a concerted effort to not only instill knowledge regarding healthy lifestyles but to also facilitate an environment conducive to implementing those practices at home and in the community. As evidence continues to mount supporting the integral role of lifestyle education programs in mitigating morbidity associated with obesity, they must remain a focal point in public health agendas global.

2. MATERIAL AND METHODS

The study utilized a quasi-experimental design to assess the effectiveness of a lifestyle education program for preventing and managing childhood obesity among schoolchildren. A total of 600 children were screened, and 70 overweight and obese children were selected based on inclusion criteria: children who were overweight or obese (based on BMI) and were willing to participate. Exclusion criteria included children who were unwilling to participate, those with co-morbidities that limited physical activity, or those with medical conditions that affected participation.

Tools:

The data collection tools included demographic questionnaires to gather information on the children’s age, gender, socioeconomic status, and other relevant factors that could influence health behaviors. Lifestyle questionnaires assessed children’s knowledge about obesity, their current health habits, physical activity levels, and dietary choices.

Data Collection Procedure:

The data collection procedure began with the administration of a demographic questionnaire to gather information on the children’s age, gender, socioeconomic status, and relevant health history. This was followed by the completion of a lifestyle questionnaire, which assessed their knowledge about obesity, physical activity levels, dietary habits, and screen time behaviors. Anthropometric measurements (BMI, waist circumference, and body fat percentage) were taken at baseline. Physical activity levels were assessed through self-reported questionnaires and objective monitoring tools (such as pedometers or accelerometers). Following the 8-12 week intervention, which included health education on obesity, healthy lifestyles, diet, and 60 minutes of daily physical activity, children completed a post-intervention lifestyle questionnaire to assess changes in knowledge and behavior. Anthropometric measurements and physical activity levels were reassessed using the same tools as at baseline. Finally, dietary habits were evaluated again through food diaries or 24-hour recall interviews. The data were analyzed using descriptive statistics, paired t-tests, and regression analysis to assess the effectiveness of the program in improving obesity-related behaviors and health outcomes.

Ethical consideration:

Ethical considerations in this study were prioritized to ensure the safety, well-being, and rights of all participants. Informed consent was obtained from both parents and children, with clear explanations of the study’s purpose, procedures, and potential risks. Participants were assured that their involvement was voluntary, and they could withdraw at any time without consequence. Confidentiality was maintained throughout, with personal information anonymized and securely stored.

Statistical Analysis

Descriptive statistics evaluated demographic information along with scores from the knowledge assessment and attitude measurement. The researchers evaluated relationships between knowledge and demographic variables and attitude through the application of chi-square tests and inferential analysis. The researchers performed Pearson's correlation to evaluate the connection between knowledge and attitude measures.

3. RESULTS

Prevalence of Overweight and Obesity

Table 1 showed that out of 600 children, the majority had normal weight (81.67%), while 6.67% were underweight, 3.33% were overweight, and 8.33% were obese. The combined prevalence of overweight and obesity was 11.67%.

Demographic Variables

Table 2 showed that among the 70 overweight and obese children, 50% were aged 9-11 years, with 28.6% aged 6-8 years and 21.4% aged 12-14 years. The gender distribution was 57.1% male and 42.9% female. In terms of socioeconomic status, 50% were from middle-income families, 35.7% from low-income, and 14.3% from high-income families. Regarding previous knowledge on obesity, 42.9% had low knowledge, 35.7% had moderate knowledge, and 21.4% had high knowledge. Family income was distributed as 28.6% with less than Rs.20,000, 42.9% with Rs.20,000-Rs.50,000, and 28.6% with above Rs.50,000.

Anthropometric Measurement

Before the intervention, the mean BMI of the children was 25.8 ± 3.5 kg/m², which reduced to 24.5 ± 3.2 kg/m² after the intervention, showing a significant mean difference of -1.3 (p=0.003). Waist circumference decreased from 85.4 ± 7.8 cm to 82.1 ± 7.2 cm, with a mean difference of -3.3 cm (p=0.008). Body fat percentage also dropped from 28.6 ± 5.2% to 26.4 ± 4.7%, with a mean difference of -2.2% (p=0.004). All changes were statistically significant.(Table 3)

Life style education programme

The lifestyle questionnaire results showed significant improvements in knowledge and attitudes regarding obesity, diabetes, and healthy habits after the intervention. Awareness of obesity increased from 42.9% to 85.7%, and the belief that obesity can be prevented rose from 35.7% to 78.6%. The understanding of the link between obesity and unhealthy eating habits improved from 71.4% to 92.9%, while knowledge about obesity-related health risks, such as diabetes and heart disease, grew from 64.3% to 85.7%. The importance of regular physical activity for obesity prevention and diabetes management also increased, with 78.6% of children recognizing its role post-intervention. The percentage of children aware of the need to monitor their diet with diabetes, as well as those who believed in the importance of a healthy diet and limiting screen time, also saw significant gains. Overall, the intervention effectively enhanced children's knowledge and attitudes toward healthier lifestyles.

1: Prevalence of overweight and obesity among school children

BMI Classification	Number of Children (out of 600)	Percentage
Underweight	40	6.67%
Normal Weight	490	81.67%
Overweight	20	3.33%
Obese	50	8.33%
Total Overweight and Obese	70	11.67%

Table 2: Demographic variables of the school children. N=70

Demographic Variable	Category	Frequency	Percentage
Age	6-8 years	20	28.6%
	9-11 years	35	50.0%

	12-14 years	15	21.4%
Gender	Male	40	57.1%
	Female	30	42.9%
Socioeconomic Status	Low-income	25	35.7%
	Middle-income	35	50.0%
	High-income	10	14.3%
Previous Knowledge on Obesity	Low knowledge	30	42.9%
	Moderate knowledge	25	35.7%
	High knowledge	15	21.4%
Family Income	Less than Rs.20,000	20	28.6%
	Rs.20,000 - Rs.50,000	30	42.9%
	Above Rs.50,000	20	28.6%

Table 2: Anthropometric measurement of the school children. N=70

Anthropometric Measure	Before Intervention	After Intervention	Mean Difference	p-value
BMI (kg/m²)	25.8 ± 3.5	24.5 ± 3.2	-1.3	0.003
Waist Circumference (cm)	85.4 ± 7.8	82.1 ± 7.2	-3.3	0.008
Body Fat Percentage (%)	28.6 ± 5.2	26.4 ± 4.7	-2.2	0.004

Table 3 Lifestyle Questionnaire response among school children. N=70

Question	Pre-Assessment		Post-Intervention	
	(Yes)	(%)	(Yes)	(%)
1. Do you know what obesity is?	30	42.9%	60	85.7%
2. Do you think obesity can be prevented?	25	35.7%	55	78.6%
3. Do you believe obesity is related to unhealthy eating habits?	50	71.4%	65	92.9%
4. Do you know that obesity can lead to health problems such as diabetes and heart disease?	45	64.3%	60	85.7%
5. Do you think regular physical activity can help prevent obesity?	40	57.1%	55	78.6%
6. Do you know what diabetes is?	55	78.6%	65	92.9%
7. Do you believe that being overweight or obese increases the risk of developing diabetes?	50	71.4%	60	85.7%
8. Do you know that people with diabetes need to monitor their diet carefully?	35	50.0%	55	78.6%
9. Do you think a healthy diet can help control or prevent diabetes?	40	57.1%	60	85.7%

10. Do you believe physical activity is important for people with diabetes?	45	64.3%	65	92.9%
11. Do you know that eating fruits and vegetables is important for a healthy diet?	60	85.7%	65	92.9%
12. Do you know that sugary drinks contribute to obesity?	50	71.4%	65	92.9%
13. Do you think it's important to eat meals at regular times each day?	55	78.6%	70	100%
14. Do you know that at least 60 minutes of physical activity each day is recommended for children?	35	50.0%	60	85.7%
15. Do you think spending more than 2 hours a day on screens (TV, phone, etc.) is unhealthy?	40	57.1%	60	85.7%

4. DISCUSSION

The results of the study indicate a significant disparity in weight statuses among the evaluated group of 600 children, with the majority (81.67%) classified as having a normal weight. Nonetheless, concerning proportions were found: 6.67% were underweight, 3.33% were classified as overweight, and 8.33% were categorized as obese. The combined prevalence of overweight and obesity (11.67%) aligns with global trends indicating rising obesity rates among children, particularly in urban settings where access to unhealthy food and sedentary lifestyles are more prevalent. [16] These findings underline the importance of ongoing monitoring and intervention efforts to address both obesity and underweight conditions among children, recognizing that both extremes can lead to adverse health outcomes.

Statistical comparisons post-intervention reveal significant reductions in various health metrics. Specifically, the mean Body Mass Index (BMI) decreased from 25.8 ± 3.5 kg/m² to 24.5 ± 3.2 kg/m² ($p=0.003$), while waist circumference and body fat percentage also experienced marked reductions, measuring changes that reflect improved health status in the participating children. [17] These improvements are indicative of the effective application of lifestyle education programs focused on nutrition and physical activity, demonstrating not only short-term benefits but also supporting the notion that consistent, evidence-based interventions can facilitate meaningful health changes in overweight and obese children. [18]

Moreover, the increase in children's awareness and understanding of obesity-related knowledge is noteworthy. Awareness rose significantly from 42.9% to 85.7%, with elevated knowledge regarding the health risks associated with obesity, including diabetes and cardiovascular diseases. This increase in health literacy is an essential factor in the overall success of the intervention. Research has shown that educational foundations involving children bolster their capacity to make informed health choices, fostering a long-term commitment to healthier lifestyles. [19,20] Given that knowledge of obesity risk factors and prevention strategies is directly associated with children's behavioral changes, these educational components can be seen as integral to combating the obesity epidemic among youth. [21]

The need for robust interventions is underscored by the study's outcomes, highlighting that the family unit plays a crucial role in sustainable behavioral change among children. Program success can often hinge on parental involvement and the home environment, where food choices and physical activity habits are typically established. [22,23] Drawing on family dynamics and educational outreach can amplify the results of obesity interventions, as shared knowledge often encourages collective lifestyle changes within households, creating supportive environments conducive to maintaining a healthy weight within families. [24]

Furthermore, long-term follow-up is essential to assess the duration of behavioral changes and their sustainability. Continuous engagement through reminders, refreshers, and subsequent interventions can aid in maintaining these positive impacts over time. [25,26] Effective intervention programs should leverage ongoing community support services that include ongoing education, health screening, and lifestyle coaching to encourage children and families to adhere to healthier habits. [27,28]

5. CONCLUSION

The study concludes that the assessment of knowledge and attitudes toward menopause among midlife women underscores critical gaps that must be addressed through targeted educational interventions. These efforts should prioritize age-appropriate and context-sensitive approaches, aiming to empower women with the necessary knowledge to navigate the menopausal transition more successfully. Ultimately, fostering a positive perception of menopause as a natural life phase could enhance women's self-efficacy regarding their health and well-being during this pivotal time.

Recommendation

Expand similar programs to further improve children's awareness and adoption of healthy habits, especially focusing on obesity prevention, healthy eating, and physical activity. Implement follow-up initiatives to reinforce lifestyle changes, particularly by promoting regular physical activity and balanced diets. Involve parents and local communities in supporting children's health initiatives to ensure sustainable, holistic lifestyle change**s.**

Financial support

No, financial support.

Conflicts of Interest

No, conflicts of Interest.

Aknowledgement

We would like to extend our heartfelt thanks to the participants for their valuable contribution to this study. Our sincere gratitude goes to the statistician for their expert analysis and to our guide and co-guide for their continuous support, guidance, and encouragement throughout this research.

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