

Causes, Prevention Strategies and Treatment for Childhood Obesity for Growing Epidemic and its Health Risks

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ABSTRACT

Objective: To address this critical problem, we looked at the causes, preventative measures, and available therapeutic options for paediatric obesity.

Study Design: A cross-sectional study.

Place and Duration of Study: This study was conducted at the National Hospital and Medical Centre in Lahore from June 2022 to May 2023.

Materials and Methods: Using a representative sample of 246 kids between the ages of 5 and 12 who were patients at the National Hospital and Medical Centre in Lahore, a cross-sectional survey methodology was used. Data on obesity risk factors, food habits, levels of physical activity, and family history were gathered using anthropometric measures and structured questionnaires.

Results: The average age of the research participants was 7.23±3.09 years, and 154 (62.60%) men and 92 (37.39%) women made up the gender distribution (p 0.05). The results of the investigation showed that 45% of obese kids had a genetic tendency, 40% had diets high in fat or calories or poor in fibre, 40% were sedentary, and 35% had high socioeconomic level as a risk factor. Dietary changes among the therapy alternatives showed the best efficacy at 65% (p 0.05), followed by more exercise and physical activity at 60%. In 25% of instances, pharmacotherapy was used, and in 30%, cognitive behavioural therapy. The most effective treatments, with a 70% success rate, were combinations.

Conclusion: It is feasible to stop the growing trend of paediatric obesity and reduce the associated health risks by making significant investments in rigorous research, placing a high priority on health education, and putting into practise evidence-based policy. This research made a substantial contribution to the body of knowledge by offering insightful information for the creation of focused preventive and treatment plans to address juvenile obesity.

Key Words: BMI; Diet; Evidence based policies; Health risks; Obesity; Pediatric nutrition.

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INTRODUCTION

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Childhood obesity has emerged as a major public health concern, with a dramatic increase in prevalence worldwide¹⁻². Health professionals, policymakers, and parents are alarmed by the rapid growth of this epidemic. Both immediate and long-term health hazards are associated with childhood obesity³. As a result, there is an urgent need to investigate the causes, develop prevention strategies, and investigate treatment options in order to combat this escalating crisis and mitigate its negative effects on the health of children⁴. For effective therapies to be developed, it is crucial to understand the underlying causes of teenage obesity. Its development is influenced by a number of variables, such as genetic predisposition, environmental effects, and lifestyle decisions⁵⁻⁷. Although heredity and environment combine to influence an individual's vulnerability to obesity, genetic variables play a part in this process. It is becoming increasingly common for people to live in an atmosphere that is conducive to obesity, which is characterised by the easy access to high-calorie meals and sedentary habits.⁸⁻⁹

Prevention strategies are essential for combating the epidemic of childhood obesity. These efforts should concentrate on promoting healthy behaviors and establishing environments conducive to a healthy diet and regular physical activity¹⁰⁻¹¹. Various settings, including schools, communities, and families, can be targeted by interventions to address the multiple influences on children's weight status. Nutrition education, enhanced access to healthy foods, physical activity promotion, and policy changes to restrict the marketing of unhealthy foods to children are all examples of comprehensive approaches¹².

When preventative measures fail, it is crucial to have effective treatment options for children who are already obese¹³. Each child's treatment plan should be individualized and multidisciplinary, incorporating dietary modifications, increased physical activity, behavior therapy, and, in some instances, pharmacotherapy or bariatric surgery. Identification and intervention at an early age are crucial for preventing childhood obesity from persisting into maturity, where it is more difficult to treat¹⁴⁻¹⁷.

In this study, we examined the causes of adolescent obesity, as well as prevention and treatment options. By shedding light on these aspects, we hope to contribute to ongoing efforts to combat childhood obesity and enhance global child health. Through a comprehensive approach that included both prevention and treatment, we cultivated healthier environments for children and mitigated the long-term health effects of this escalating epidemic.

MATERIALS AND METHODS

Study design: This cross-sectional study examined the causes, prevention strategies, and treatment options for pediatric obesity in National Hospital and Medical Centre Lahore. The design permitted the accumulation of data at a particular point in time, providing a snapshot of the studied population.

The survey included a representative sample of 246 children aged 5 to 12 years attending the hospital during the period from June 2022 to May 2023. The parents or legal guardians of the participating minors gave informed consent.

Inclusion Exclusion Criteria: To select participants for the investigation, the study utilized specific inclusion and exclusion criteria. The inclusion criteria included children ages 5 to 12 years who attended the hospital, with parental or legal guardian permission. By including children within this age range, the study targeted a crucial developmental period for obesity prevention and treatment. In addition, parental consent ensured adherence to ethical guidelines and protected the welfare of the children who participated¹⁸.

In contrast, exclusion criteria were implemented to guarantee the integrity and validity of the study's findings. Children outside the specified age range were

excluded from the data collection procedure in order to maintain uniformity and focus on the target population. To uphold ethical considerations and to respect the rights of the individuals involved, children whose parents or legal guardians did not give assent were also excluded.

Data Collection: Anthropometric calculations: Each child's height and weight were determined using standardized methods. Using a stadiometer, height was measured to the nearest centimeter, and using a calibrated scale, weight was measured to the nearest 0.1 kilogram. The body mass index (BMI) was determined by dividing weight (in kilogram) by height (in meters squared). A structured questionnaire was created to capture data on potential risk factors, including dietary habits, physical activity levels, screen time, and family history of obesity.

Statistical Analysis: The prevalence of childhood obesity was determined using BMI percentiles and age and gender-specific cutoff factors. The associations between risk factors and adolescent obesity were evaluated using Chi-square tests and ANOVA tests.

Ethical Considerations: Institutional Review Board approval was obtained prior to the study's initiation. The confidentiality of participant information was maintained²⁰.

RESULTS

The sample size of 246 participants in the study represented the entire population under investigation. Participants' ages ranged from 1 year to 12 years, and gender distribution of participants revealed that 154 were male ($p < 0.05$). This variation in gender distribution had implications for comprehending the different risk factors, prevalence, and treatment outcomes associated with childhood obesity in males and females. The p -value for age was 0.626, indicating that there was no statistically significant difference in the distribution of ages among the participants (Table 1). Gender-specific breakdown of the number of obese children across various age categories were categorically studied. There were 26 males (16.88%) and 21 females (22.82%) in 1st age group with non-significant difference in distribution of obesity between males and females. 19.10% of children in this age range were considered obese. In the second row, there were 40 obese infants between the ages of 5 and 7 years old. 24 were men (15.58 percent) and 16 were women (17.39 percent). Overall, 16.26% of children in this age cohort were overweight (Table 2).

The presented data reflected the percentage of risk factors in obese children, whereby in 45% of participants genetic predisposition was considered the risk factor, indicating a significant recognition of the role genetics play in the development of obesity ($p < 0.05$). Forty percent of respondents perceive a low-fiber diet as a risk factor, underscoring the

understanding that dietary choices, particularly the lack of fiber, can contribute to obesity. The majority, consisting of 65 percent of participants, recognized a high-calorie diet as a risk factor for obesity. 40% of respondents identified a sedentary lifestyle as a risk factor. 35% of participants perceived high socioeconomic status as a risk factor and 30% of respondents recognized the obesogenic environment as a risk factor, emphasizing the impact of environmental factors such as the availability of high-calorie foods and sedentary behaviors. 20% of participants viewed parental influence as a risk factor, indicating an awareness of the impact of parental behaviors and routines on a child's risk of obesity. Emotional considerations were considered a danger factor by 10% of respondents. (Figure 1). The relationship between sedentary behavior and childhood obesity revealed that 15% of children were obese. Children who watched more than 4 hours of television per day, played video games for more than 4 hours per day, and used mobile and other electronic devices for more than 4 hours per day accounted for 45% of the obese children (Figure 2). Information regarding the efficacy of various treatments for pediatric obesity indicated that dietary modifications were effective in 65% of cases ($p < 0.05$). This indicated that dietary modifications, such as reducing calorie consumption and improving food selection, had positive impact on the management of childhood obesity. In 60% of instances, increased physical activity and exercise were deemed effective. In 25% of cases, pharmacotherapy, or the use of medications to treat obesity, was found to be effective. The comparatively low efficacy suggested that medication alone were insufficient to treat childhood obesity and that it should

be combined with other interventions. In 30% of cases, cognitive behavioral therapy, a psychological approach that targets behavior modification, was effective. At 70%, combination therapies, which entail a comprehensive approach combining multiple interventions, demonstrated the greatest efficacy (Table 3).

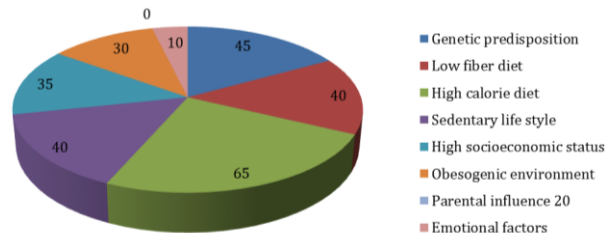


Figure No. 1: Significant risk factors for childhood obesity

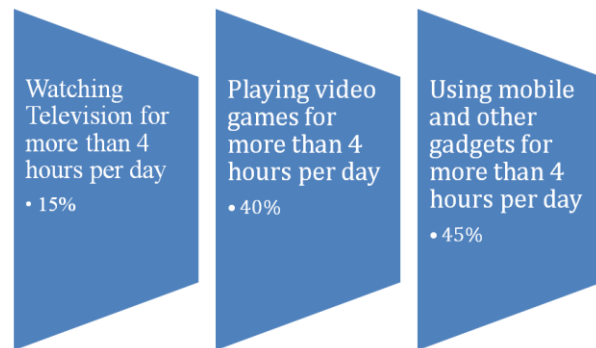


Figure No. 2: Relationship between Sedentary Behavior and Childhood Obesity

Table No. 1: Characteristics of the study population

S. No	Demographic characteristics	No. of participants (n)	Frequency (%)	p-value
1	Sample size	246	100	1.00
2	Age (Mean + SD) years	7.23+3.09	---	0.626
3	Gender			0.00001*
	Male	154	62.60	
	Female	92	37.39	

* $p < 0.05$, which signifies that the value is significant

Table No. 2: Prevalence of childhood obesity in participants

S. No	No. of obese children (n)	Age group (years)	Male n(%)	Female n(%)	χ^2	p-value	Total (%)	p-value
1	47	<4	26 (16.88)	21 (22.82)	0.2961	0.5863	19.10	0.00001*
2	40	5-7	24 (15.58)	16 (17.39)	1.107	0.2927	16.26	
3	91	8-10	58 (37.66)	33 (35.86)	5.269	0.0217*	36.99	
4	68	11-12	46 (29.87)	22 (23.91)	6.765	0.0092*	27.64	

*indicated that the value is significant at $p < 0.05$

Table No. 3: Therapeutic options and preventive strategies for childhood obesity and its outcomes

S. No	Treatment option	Effectiveness	p-value
1	Dietary modifications	65	

2	Increased physical activity and exercise	60	0.00054*
3	Pharmacotherapy	25	
4	Cognitive behavioral therapy	30	
5	Combination therapies	70	

* p0.05, which signifies that the value is significant

DISCUSSION

Identifying the risk factors for paediatric obesity, evaluate the effectiveness of preventative measures, and look into potential treatment approaches. The research included a number of characteristics associated with childhood obesity and their corresponding percentages. Genetic predisposition was shown to be a risk factor in 45% of instances, proving the importance of genetics in determining an individual's vulnerability to obesity. High-calorie diets (65%), sedentary lifestyles (40%) and an obesogenic environment (30%) are additional factors in teenage obesity. These results underline the necessity for interventions to prevent and cure obesity that take into account both hereditary and environmental variables. The effectiveness of different preventative techniques was also evaluated by the research. Dietary changes were shown to be successful in 65% of instances, underscoring the importance of encouraging improved eating habits and food preferences. The importance of encouraging regular physical activity to fight paediatric obesity is shown by the fact that increased physical activity and exercise were successful in 60% of instances. These results encourage the use of extensive interventions that encourage healthy habits and foster healthy settings. In the research, the effectiveness of treatment choices was assessed. Pharmacotherapy, which uses medicine, was shown to be successful in 25% of instances. This implies that drugs may be used to treat obesity, however their efficacy might be limited. The 30% success rate of cognitive behavioural therapy showed how crucial it is to focus on psychological and behavioural factors when treating paediatric obesity. Combination therapy showed the highest success at 70%, including an all-encompassing strategy that incorporates various interventions. This highlights the need of a comprehensive treatment strategy that includes dietary adjustments, increased physical activity, behavioural therapy, and maybe other therapies. Our results were in line with a research that showed a recent worldwide rise in the incidence of paediatric obesity. Significant risks to public health were presented by the prevalence of childhood obesity in both industrialised and underdeveloped countries. Children who were overweight had a higher risk of becoming obese as adults and having trouble

exercising. It was suggested that parents urge their kids to exercise every day. In order to provide a healthy atmosphere for their children, parents were essential. Global changes in lifestyle, such as a decline in physical activity and an increase in the intake of high-calorie meals, had an impact on this transformation.²

Our results were also in agreement with the study's findings that child and adolescent obesity rates have reached a plateau in the majority of high-income countries, whereas they are on the rise in many low-income and middle-income nations. The onset of obesity is influenced by genetic and epigenetic factors, behavioral risk patterns, and broader environmental and sociocultural influences. These factors influence two systems responsible for regulating body weight: energy homeostasis, which operates unconsciously and involves signals from leptin and the gastrointestinal tract, and cognitive-emotional control, which is controlled by higher brain centers and operates consciously. Obesity had negative effect on the health-related quality of life of those affected. Teenagers and those with extreme obesity are at a greater risk for comorbidities such as type 2 diabetes, fatty liver disease, and depression in their future life. Dietary choices, physical activity levels, sedentary behaviors, and sleep were addressed in the treatment of obesity, which employs a family-centered, stigma-free, and respectful approach incorporating multiple components. Beneficial adjunctive therapies for adolescents include intensive dietary interventions, pharmacotherapy, and bariatric surgery⁷.

Primary care providers and behavioral interventionists must collaborate and assist families in adopting healthy behaviors within various socio-environmental domains, including family, home, peer, and community settings, in order to effectively address overweight and obese adolescents¹⁵.

CONCLUSION

This study illuminated the complexity of pediatric obesity by identifying key risk factors including genetic predisposition, high-calorie diet, sedentary lifestyle, and obesogenic environment. The findings highlighted the significance of instituting prevention strategies that encouraged healthier dietary habits and increased physical activity. In addition, the study emphasized the potential efficacy of combination therapies in the treatment of pediatric obesity, while acknowledging the moderate efficacy of pharmacotherapy and cognitive behavioral therapy. It is possible to reverse the upward trend of pediatric obesity and mitigate the associated health risks by investing in rigorous research, prioritizing health education, and implementing evidence-based policies. Healthcare practitioners and parents can contribute to the reduction of childhood obesity rates and enhance the long-term health outcomes of affected children by utilizing evidence-

based strategies and creating supportive environments. For a more holistic understanding and management of childhood obesity, however, further research is required to surmount study limitations and explore additional therapeutic options.

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