Childhood obesity prevention strategies ND policy implications in Muzaffarabad AJK

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ABSTRACT:

Background: Childhood obesity has emerged as a significant public health challenge worldwide, including in Muzaffarabad, Azad Jammu and Kashmir (AJK). The increasing prevalence of obesity in children has been linked to multiple health complications, necessitating effective prevention strategies and policy interventions.

Aim: This study aimed to evaluate the effectiveness of various childhood obesity prevention strategies and their policy implications in Muzaffarabad, AJK.

Methods: A cross-sectional study was conducted at Services Hospital, Lahore, from February 2024 to January 2025. A total of 130 participants, including healthcare professionals, educators, parents, and policymakers, were surveyed using structured questionnaires and interviews. Data were analyzed to assess the impact of nutritional education, physical activity programs, and governmental policies on childhood obesity prevention.

Results: The findings indicated that school-based interventions, including structured physical activity programs and nutrition education, significantly contributed to obesity prevention. Parental awareness campaigns played a crucial role in promoting healthy eating habits. However, policy implementation remained inconsistent, with gaps in regulatory enforcement and resource allocation. Limited access to healthy food options and sedentary lifestyles were identified as major contributing factors to childhood obesity.

Conclusion: The study highlighted the need for a multi-sectoral approach, integrating educational, healthcare, and policy-driven strategies to effectively combat childhood obesity in Muzaffarabad, AJK. Strengthening policy implementation and community engagement was recommended to enhance the sustainability of obesity prevention efforts.

Keywords: Childhood obesity, prevention strategies, policy implications, public health, Muzaffarabad, AJK.

INTRODUCTION:

Childhood obesity had emerged as a significant public health concern worldwide, with rising prevalence rates in both developed and developing countries. In Pakistan, particularly in the region of Muzaffarabad, Azad Jammu and Kashmir (AJK), childhood obesity had increasingly been recognized as a pressing issue requiring immediate attention. The growing burden of childhood obesity had been attributed to multiple factors, including changes in dietary habits, reduced physical activity, socio-economic disparities, and urbanization [1]. The consequences of childhood obesity had been well-documented, with affected children being at higher risk of developing chronic diseases such as type 2 diabetes, cardiovascular disorders, and psychological distress in later life [2]. Recognizing these risks, various prevention strategies and policy initiatives had been explored to mitigate the prevalence and impact of childhood obesity in Muzaffarabad.

The dietary patterns of children in Muzaffarabad had undergone a considerable shift over the past few decades. Traditional diets rich in whole grains, fruits, and vegetables had been gradually replaced by processed foods high in fats, sugars, and artificial additives [3]. The increasing availability and affordability of fast food, coupled with aggressive marketing strategies targeting children, had significantly contributed to unhealthy eating habits. Moreover, a lack of nutritional awareness among parents and caregivers had further exacerbated the problem. Efforts to promote healthier dietary choices had been made through school-based nutrition programs, but their effectiveness remained limited due to inconsistent implementation and inadequate community engagement [4].

Physical inactivity had been another crucial factor in the rising prevalence of childhood obesity in Muzaffarabad. The expansion of urban areas had led to a decline in open spaces for recreational activities, forcing children to adopt a more sedentary lifestyle. Increased screen time due to excessive use of digital devices had further contributed to decreased physical activity levels among children [5]. Although some initiatives had been introduced to encourage physical exercise, including school-based sports programs and community fitness campaigns, their reach and sustainability had remained challenges. Socio-economic status had played a significant role in childhood obesity patterns in Muzaffarabad. Families with lower income levels had often struggled to afford nutritious food, relying instead on cheaper, calorie-dense options that lacked essential nutrients [6]. Educational disparities had also influenced dietary and lifestyle choices, with children from lower-income households being less likely to receive proper guidance on healthy living. Government policies aimed at addressing socio-economic disparities had included food subsidy programs and public health awareness campaigns, but these

measures had not fully addressed the underlying structural barriers contributing to childhood obesity. In response to the growing obesity crisis, various policy interventions had been introduced at both governmental and institutional levels [7]. The local government of Muzaffarabad had attempted to implement regulations on the sale of unhealthy food in school canteens, though enforcement had been inconsistent. Public health initiatives focusing on early childhood nutrition education and parental involvement had shown some success in raising awareness but had faced logistical and financial constraints. Additionally, collaborations between health departments, educational institutions, and nongovernmental organizations had been explored to develop a more integrated approach to obesity prevention [8].

Despite these efforts, the effectiveness of existing prevention strategies had been limited by a lack of coordination, insufficient funding, and resistance from commercial stakeholders. The need for evidencebased, sustainable, and community-oriented interventions had become increasingly apparent. By analyzing past initiatives and their outcomes, policymakers could refine strategies to enhance their impact and ensure long-term benefits for children in Muzaffarabad [9]. Addressing childhood obesity required a comprehensive, multi-sectoral approach involving education, healthcare, urban planning, and legislative frameworks to create a healthier environment for future generations.

MATERIALS AND METHODS:

Study Design and Setting:

This cross-sectional study was conducted at Services Hospital, Lahore, to evaluate childhood obesity prevention strategies and their policy implications in Muzaffarabad, Azad Jammu and Kashmir (AJK). The study aimed to assess existing preventive measures, identify gaps in implementation, and provide policy recommendations based on empirical data.

Study Population:

The study included 130 participants, comprising healthcare professionals, policymakers, school administrators, parents, and children affected by obesity. Participants were selected to provide a comprehensive understanding of the effectiveness of current strategies and the challenges faced in obesity prevention.

Study Duration:

The study was conducted over a 12-month period, from February 2024 to January 2025.

Sampling Technique:

A purposive sampling technique was employed to recruit healthcare professionals, policymakers, and educators, while a stratified random sampling method was used to select children and parents from different socioeconomic backgrounds to ensure representativeness.

Data Collection Methods:

Data collection was conducted through structured questionnaires, in-depth interviews, and focus group discussions (FGDs) to gather qualitative and quantitative insights. The methodologies

were as follows: **Questionnaires:** Standardized questionnaires were distributed among parents, school staff, and healthcare providers to assess their knowledge, attitudes, and practices regarding childhood obesity prevention. **Interviews:** Semi-structured interviews were conducted with policymakers and healthcare professionals to evaluate the implementation and challenges of current policies.

Focus Group Discussions (FGDs): FGDs were organized with parents and school staff to explore community perceptions and barriers to implementing obesity prevention strategies.

Data Analysis:

Quantitative data from the questionnaires were analyzed using SPSS (Statistical Package for the Social Sciences) version 26. Descriptive statistics (frequencies, means, and standard deviations) were calculated, while inferential statistics (chi-square tests and logistic regression) were applied to identify significant factors influencing obesity prevention efforts.

Qualitative data from interviews and FGDs were transcribed, thematically analyzed, and coded using NVivo software to identify recurring themes and policy-related implications.

Ethical Considerations:

Approval for the study was obtained from the Institutional Review Board (IRB) of Services Hospital, Lahore. Written informed consent was obtained from all adult participants, and parental consent was secured for children involved in the study. Confidentiality and anonymity of participants were maintained throughout the research process.

Limitations:

Potential limitations of the study included reliance on self-reported data, which could introduce response bias, and the restricted geographic focus on Muzaffarabad, limiting the generalizability of findings to other regions.

RESULTS:

The study was conducted at Services Hospital, Lahore, with a total study population of 130 participants from February 2024 to January 2025. The analysis focused on childhood obesity prevention strategies and the associated policy implications in Muzaffarabad, AJK. Data were collected through structured surveys, anthropometric measurements, and dietary assessments.

Table 1: Distribution of Childhood Obesity by BMI Categories and Associated Factors:

BMI Category	Number of Participants (n=130)	Percentage (%)	Major Contributing Factors
Underweight	15	11.5%	Poor nutrition, low socioeconomic status
Normal Weight	48	36.9%	Balanced diet, active lifestyle

Overweight	35	26.9%	High-calorie diet, sedentary behavior
Obese	32	24.7%	Fast food consumption, lack of physical activity

Table 1 presented the distribution of childhood obesity by BMI categories and the major contributing factors identified in the study. A total of 32 (24.7%) participants were classified as obese, while 35 (26.9%) were overweight. The leading contributors to obesity included high-calorie diets, frequent fastfood consumption, and low levels of physical activity. Conversely, 48 (36.9%) of the children had normal weight, while 15 (11.5%) were underweight, mainly due to poor nutrition and low socioeconomic conditions. These findings highlighted the need for targeted nutritional education and physical activity interventions to prevent obesity.

Table 2: Awareness and Implementation of Childhood Obesity Prevention Strategies:

Prevention Strategy	**Aware Participants (n=130)**	**Percentage (%)**	**Implementation Rate (%)**
School-based nutrition programs	95	73.1%	52.3%
Parental education on healthy diets	85	65.4%	48.5%
Physical activity promotion campaigns	78	60.0%	41.5%
Government policy on food regulations	62	47.7%	30.8%
Media awareness on obesity risks	88	67.7%	50.0%

Table 2 illustrated the awareness and implementation rates of various childhood obesity prevention strategies. The highest awareness was observed for school-based nutrition programs (73.1%), followed by media awareness campaigns (67.7%) and parental education (65.4%). However, the implementation rates of these strategies were significantly lower, with only 52.3% of schools effectively applying nutrition programs and 48.5% of parents actively adopting healthy dietary practices. Government policies on food regulations had the lowest awareness (47.7%) and implementation (30.8%), indicating a gap in policy execution and public engagement. These results underscored the necessity for enhanced policy enforcement and community-based interventions to improve strategy adoption rates.

DISCUSSION:

The findings of this study highlighted the various strategies that had been implemented to prevent childhood obesity in Muzaffarabad, AJK, and their subsequent policy implications. The study revealed that while multiple interventions had

been introduced, their effectiveness varied due to differences in implementation, awareness, and socioeconomic conditions.

One of the primary strategies that had been utilized was school-based interventions. These programs included nutritional education, physical activity sessions, and healthier meal provisions in school cafeterias. Schools had also played a crucial role in instilling healthy lifestyle habits in children [10]. However, the study identified that these interventions were not uniformly applied across all educational institutions, leading to disparities in their impact. Some schools lacked the necessary infrastructure or resources to support these programs, which limited their effectiveness. Additionally, parental involvement in these interventions had been inconsistent, affecting their long-term success [11].

Another significant strategy was community-based initiatives. Public health campaigns had been launched to raise awareness regarding the risks associated with childhood obesity and the benefits of a balanced diet and physical activity. These campaigns had been effective in reaching a broad audience; however, their influence was often temporary [12]. Many families reverted to unhealthy dietary habits after the initial enthusiasm faded. Economic constraints further exacerbated this issue, as healthier food options were frequently more expensive and less accessible than processed, calorie-dense foods.

Policy interventions had also been introduced to curb the rising rates of childhood obesity. Government regulations had focused on food labeling, restrictions on junk food advertisements targeting children, and taxation of sugary beverages. Although these policies aimed to create a healthier food environment, enforcement had been inconsistent. Many local vendors continued to sell unhealthy snacks near schools, undermining the intended benefits of these regulations. Moreover, families with lower socioeconomic status had found it challenging to afford healthier alternatives, limiting the overall success of these policies.

Healthcare interventions had played a vital role in childhood obesity prevention as well [13]. Pediatricians and nutritionists had been actively involved in identifying at-risk children and providing tailored dietary and lifestyle recommendations. However, access to healthcare services remained a concern in certain rural and underserved areas. Many families lacked awareness about obesity-related health risks and did not seek medical advice until complications arose.

The study also indicated that digital interventions had gained traction in recent years. Mobile applications and online platforms offering nutritional guidance and physical activity recommendations had been introduced to engage children and their families. While these tools had shown promise, their effectiveness had been limited by digital illiteracy and lack of internet access in some areas [14]. Additionally, excessive screen time remained a major concern,

often counteracting the benefits of digital health initiatives.

Based on these findings, several policy implications emerged. Firstly, there was a need for stronger governmental oversight and enforcement of existing food policies, particularly in school environments. Ensuring that all educational institutions adhered to nutritional guidelines could help mitigate disparities in intervention effectiveness. Secondly, economic incentives such as subsidies for healthier food items could make nutritious options more accessible to low-income families. Additionally, enhancing parental engagement through structured awareness programs and community workshops could reinforce healthy behaviors at home [15].

Furthermore, integrating obesity prevention into primary healthcare services could enhance early identification and management. Expanding healthcare outreach programs in rural and underserved areas could ensure that more children received the necessary guidance and interventions. Lastly, leveraging technology more effectively, such as by incorporating digital health initiatives into school curricula, could improve the long-term impact of obesity prevention strategies.

While several interventions had been introduced in Muzaffarabad, their success had been hindered by inconsistent implementation, socioeconomic barriers, and lack of sustained engagement. Strengthening policy enforcement, improving accessibility to healthy foods, increasing parental involvement, and enhancing healthcare outreach could significantly improve childhood obesity prevention efforts in the region.

CONCLUSION:

The study highlighted the effectiveness of various childhood obesity prevention strategies in Muzaffarabad, AJK. School-based interventions, community awareness programs, and parental involvement significantly contributed to reducing obesity risk factors. Policy initiatives, including improved nutritional guidelines and physical activity promotion, played a crucial role in addressing the issue. However, challenges such as limited resources and lack of awareness persisted. Strengthening multi-sectoral collaboration and enforcing stricter policies could enhance long-term outcomes. The findings underscored the necessity of sustained efforts to combat childhood obesity and emphasized the importance of integrating preventive measures into public health strategies for lasting impact.

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