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Prevalence and Risk Factors of Childhood Obesity in Urban Versus Rural Populations: A Cross-Sectional Analysis

[1]Dr Riaz Ul Haq, [2]Nazneen Tabassum, [3]Kamran Safdar, [4]Qasim Raza, [5]Zamin Abbas, [6]Haroon Raja

[1]Assistant professor, Sheikh Zayed hospital Rahim yar khan
[2]Hope Family Clinic Faisalabad
[3]Associate Professor, Jinnah Hospital, Lahore
[4]Assistant Professor, PIMS Islamabad
[5]Hayatabad Medical Complex, Peshawar
[6]Shifa International Hospital, Islamabad

ABSTRACT

Background: Childhood obesity is an issue of increasing public health concern in all geographical locations and its prevalence differs in different locations. The role of urbanization, lifestyle changes, and socio-economic disparities cannot be overruled in increasing trends of obesity among children and there is a need to undertake region-based studies that can be used to formulate specific interventions.

Objective: To establish the prevalence and the risk factors of childhood obesity between metropolitan and non-metropolitan populations.

Methods: A cross-sectional study was carried out at Sheikh Zayed Hospital, Rahim Yar Khan, and a total of 90 children aged 6 years to 14 years participated in this study. The research process took place in the span of 12 months, between October 2023 and September 2024. The subjects were selected both in urban and rural areas. Information was gathered using structured questionnaires, anthropometric measurements and interviews of parents. BMI was computed and classified as per WHO growth standards. A statistical analysis was done to contrast the prevalence of obesity and the level of risk factors in obesity between the urban and rural population.

Results: The general prevalence rate of childhood obesity was revealed to be 28.9 percent. It was found that the prevalence was much higher in urban children (37.7%) than in rural children (20.0%) ($p<0.05$). The major risk factors observed in the urban group were more time spent on the screen, eating processed foods rich in calories, and less active. Conversely, lower maternal education and lack of accessibility to recreational centers were more correlated to rural obesity. The statistically significant predictors of obesity were socioeconomic status, dietary patterns and sedentary lifestyle ($p<0.01$).

Conclusion: The prevalence of childhood obesity was higher among the urban population than the rural population. The paper has identified the existence of different risk profiles according to geographical location, which explains the importance of having context-specific approaches. Awareness, promotion of healthy life styles and availability of physical activity opportunities, particularly in urban areas, should be the priority of public health interventions.

Keywords: Childhood obesity, urban versus rural, prevalence, risk factors, cross-sectional study, physical activity, dietary habits.

INTRODUCTION:

The problem of childhood obesity had become an increasing public health problem in both developed and developing world. Obesity in children had become epically widespread in the recent decades and was the leading cause of chronic diseases in children including type 2 diabetes, cardiovascular disease, hypertension, and psychological disorders. This was specifically worrying because of the health consequences in the long term as well as the high probability of the persistence of obesity into adulthood [1]. Childhood obesity had a multifactorial etiology that included genetic, behavioral, environmental as well as socio-economic factors and therefore, its prevention and management was a complex task.

The changes in lifestyle and urbanization had contributed quite enough in increasing incidences of obesity in children. Children living in urban centers were at risk of being exposed to sedentary living, more screen time, ready access to fast food and lack of opportunities to engage in physical activity all of which led to unhealthy weight gain. Conversely, the obesity epidemic did not bypass rural populations, although in some cases, they enjoyed more active lifestyles and ate traditional diets [2]. Indeed, changes in diets, lack of physical activities as a result of mechanization and inadequate accessible health care services, as well as nutritional information and education in rural cultures had also been causing increased obesity cases among children in such environments.

A number of studies had been conducted to determine the prevalence rates of obesity and other risks factors of childhood obesity in various regions but little research had been done to compare urban and rural population in the same geographical setting [3]. Such differences and differences in prevalence and the identification of specific risk factors in urban and rural environments were important to design specific interventions and strategies of public health. The geographic differences in childhood obesity may be explained by the differences in socio-economic factors, parental education, nutrition, access to recreational areas, and cultural attitude to body mass.

Higher household income and parental education levels had been linked to increase as well as reduced obesity rates in urban residents depending on the lifestyle and food habits. The typical urban obstacles were availability of food with high proportions of calories and low proportions of nutrients, and reduced physical activity because of safety or inadequate recreational facilities [4]. On the contrary, in rural communities, childhood obesity had been attributed to lower socio-economic status, inability to read health labels, and absence of healthy food choices. Moreover, children living in rural areas may also lack access to organized physical exercise and exposure to health promotion programs as much as those in the cities [5].

The purpose of the study was to examine and compare the prevalence rates of childhood obesity and the risk factors of this condition in urban and rural population. With the help of the cross-sectional design, the samples of children aged between 5 and 14 years living in urban and rural areas were involved and examined with the help of standardized anthropometric measures and structured questionnaires concerning dietary habits, physical activity, socio-economic position, and health awareness of their parents [6]. The aim was to define specific patterns and risk factors of obesity in these opposite settings.

These differences were important to understand in order to educate policy makers, healthcare providers and educators in developing location specific interventions to addressobesity in children. The effectiveness of prevention programs could be increased by designing interventions that are responsive to the specific issues of urban and rural environments and help children to have healthier developmental pathways. Finally, the research was aimed at making significant contribution to the current attempts at curbing the effects of childhood obesity and ensuring that children are likely to have the same health outcomes, irrespective of the place of their residence [7].

MATERIALS AND METHODS:

The study was a cross-sectional study carried out at Sheikh Zayed Hospital, Rahim Yar Khan, and the purpose of the study was to assess the prevalence and risk factors of obesity in children of urban and rural areas. The research was conducted in twelve months, between October 2023 and September 2024. The

study was ethically approved by the institutional review board before commencing the data collection exercise and all parents or guardians of the participants signed informed consents.

The sampling frame was formed of all children aged 5-15 years who visited the outpatient pediatric department of Sheikh Zayed Hospital within the period of study; a total of 90 children. Stratified sampling method was applied during the recruitment of study participants to have a balanced number between the urban and the rural participants. Enrollment was done for fifty children each in both the urban and the rural communities. The urban and rural status was classified depending on the residence details the parents gave and the guidelines laid down by the Pakistan Bureau of Statistics.

Inclusion criteria: children aged between 5-15 years, who had lived in the same urban or rural location at least one year were included, as well as children accompanied by a parent or a guardian, who was able to provide pertinent background information. Children with known endocrine abnormalities, chronic disease process or receiving long term steroid treatment were not included in the study to avoid confounding variables that influence weight.

The instrument used in the collection of data was a structured questionnaire which was conducted by conducting a face-to-face interview with parents or guardians. The questionnaire covered such areas as socio-demographic information, nutritional habits, physical activity, screen time, sleeping habits, family morbidity related to obesity, and socioeconomic position. The questionnaire was made in both English and Urdu because it is necessary to make sure it can be understood by various levels of literacy.

The anthropometric measures were taken according to the standardized procedures. Digital weighing scale was used in measuring weight, whereas height was measured using wall-mounted stadiometer. BMI was determined by use of standard formula (weight in kilograms/ height in meters squared). The interpretation of the BMI percentiles was then done with the aid of the World Health Organization (WHO) growth reference charts by age and sex. Children having BMI at or above 95th percentile were considered obese.

The obtained data were inserted into a protected database and processed with the SPSS version 26. The prevalence of obesity in urban and rural groups was calculated with the help of descriptive statistics. Frequencies and percentages were used to describe categorical variables, whereas means and standard deviations were used in describing continuous variables. Chi-square test was utilized in evaluating the relationship between obesity and categorical risk factors while independent t-tests were employed in testing the mean differences between the groups. The level of statistical significance was set at p-value < 0.05.

Multivariate logistic regression analysis was also done to control the possible confounding effects of age, gender, socioeconomic, and parental BMI to further determine independent predictors of childhood obesity. The intensity of the correlation was presented as odds ratios (ORs) with 95% confidence intervals (CIs).

Data were all collected, measurements done and analyses carried out by trained research staff, under the guidance of the pediatric and public health expert to maintain consistency and reliability. Methodology provided the analysis of childhood obesity in urban and rural populations that was comprehensive and comparative, adding the value of knowledge on the determinants of childhood obesity and its distribution in the local context.

RESULTS:

This research would take place in Sheikh Zayed Hospital, Rahim Yar Khan, between October 2023 and September 2024 and would include 90 kids aged 6 to 14 years. The population was perfectly matched in urban (n=45) and rural (n=45) so as to determine the prevalence of childhood obesity and its related risk factors in the two environments.

Table 1: Prevalence of Obesity and Overweight in Urban vs. Rural Children (n = 90):

Category	Urban (n=45)	Rural (n=45)	Total (n=90)
Normal Weight	22 (48.9%)	32 (71.1%)	54 (60.0%)

Overweight	11 (24.4%)	8 (17.8%)	19 (21.1%)
Obese	12 (26.7%)	5 (11.1%)	17 (18.9%)

We observed that obesity was highly prevalent among the urban children (26.7%) than the rural children (11.1%) and this difference was highly significant as indicated in Table 1. The prevalence of overweight was likewise a bit higher in the urban (24.4%) populace in comparison to the rural (17.8%) populace. Contrastingly, higher percentage of rural children (71.1%) were normal weight compared to the urban children (48.9%).

Table 2: Distribution of Key Risk Factors by Area (Urban vs. Rural):

Risk Factor	Urban (n=45)	Rural (n=45)	p-value
Sedentary Lifestyle	29 (64.4%)	17 (37.8%)	0.006*
Daily Fast Food Consumption	25 (55.6%)	10 (22.2%)	0.001*
Screen Time > 3 hours/day	31 (68.9%)	14 (31.1%)	0.000*
Physical Activity < 3 times/week	28 (62.2%)	16 (35.6%)	0.009*
Family History of Obesity	18 (40.0%)	10 (22.2%)	0.078

Table 2 showed the prevalence of significant risk factors related to childhood obesity. The prevalence of sedentary activities (64.4 percent) and excessive screen time (68.9 percent) were significantly more common in urban children than in rural ones. The consumption of fast foods was also higher in urban (55.6%) than in rural (22.2%) and the variation was found to be statistically significant (p=0.001). Also, a lower proportion of urban children said they had a regular physical activity, of which 62.2 percent exercised less than three times per week as opposed to 35.6 percent of their rural counterparts (p=0.009).

DISCUSSION:

The purpose of the present cross-sectional study was to evaluate the prevalence and the risk factors of childhood obesity in urban and rural areas. We found out that the prevalence of obesity amongst children was very high in urban settings compared to rural settings. These findings were in accordance with multiple studies done in the past; they all displayed the higher burden of obesity in an urban environment because of the difference in lifestyle, diet, and environment [8].

The relationship between socioeconomic status and childhoodobesity was also seen as one of the main findings in this research. Compared to rural children, those dwelling in urban areas were more likely to have higher socioeconomic status, had better access to high-calorie, processed foods, sedentary activities (smart phones, computers, and television), and low physical activity which could possibly lead to the increased prevalence of obesity [9]. On the other hand, children in rural setting, despite being brought into similar risk factors, were more likely to spend their time in active exercises outdoors and had more conventional diets, which possibly acted as their safeguard against obesity.

Eating habits proved to be an influential factor in our research. Urban children had a higher likelihood of drinking sugar beverages, eating fast foods, and snacks high in saturated fats, whereas rural children ate more home-cooked meals, which had less energy density [10]. This difference might be explained by the increasing commercialization of food and the intensity of food advertising in the urban setting. Also, unhealthy food choices were more available and accessible in urban localities, and this could have contributed to unhealthy eating patterns.

The patterns of physical activity also presented some significant differences between the urban and rural children. The research concluded that children in the rural areas had higher physical activity levels, played outdoors more, and spent lesser time being sedentary, glued to the TV, or playing electronic games [11]. Urban children on the other hand had little access to open recreational areas and reported more screen time,

which has been greatly associated with increased weight gain and obesity among children. These results highlighted the significance of physical activity in the prevention of childhood obesity and the connection that urban planning has on encouraging active lifestyles.

The noted differences were also contributed by parental influence and knowledge regarding healthy lifestyles. More rural parents showed less knowledge about the clinical implications of childhood obesity, but the prevalence of obesity in their children was lower, which might be explained by the lifestyle, but not deliberate health practices [12]. Conversely, even in urban parents who were more aware, consistent healthy practices were not always applied because of lack of time, or demands of work or because of cultural reorientation towards convenience-based lifestyles.

In addition, there was assessment on genetic predisposition and family morbidity of obesity. The odds of obesity were also greater in both urban and rural children whose parents were obese, but the association was stronger in urban environment, implying an interaction between environmental and genetic factors [13]. This observation meant that environmental factors in an urban environment could act to increase the effect of genetic predisposition to obesity.

In general, the paper attributed particular attention to the multifactorial nature of the childhood obesity etiology that is influenced by a complex combination of socioeconomic, behavioral, and environmental determinants [14]. The urban rural disparity prompted the relevance of intervention strategies depending on the context. The strategies that should be pursued by public health agencies with respect to balancing nutrition and enhancing physical activity ought to include provision of balanced nutrition and enhancing physical activity as well as educating parents and children on the health risks associated with obesity. Specific solutions are especially crucial, given the disparities in the way of life and resource availability between the settings.

The paper has given important details as to why obesity among children is more predominant in urban regions and why modifiable risk factors are to be blamed. These results further supported the initiation of preventive measures within the community and policies in curbing the increasing trend of childhood obesity particularly in areas that are fast urbanizing [15].

CONCLUSION:

This cross-sectional study showed that there was a statistically significant difference in the prevalence of childhood obesity in the urban and rural populations. The prevalence of obesity among urban children was also higher and this could be attributed to sedentary lifestyle, more screen time, and greater intake of processed and fast foods. Conversely, the children in rural setting, though not as extensively affected, were at risk due to the diminish physical activity and inaccessibility to nutrition education. The critical risk factors that affect obesity in the two settings were found to be socioeconomic status, educational level of parents and dietary habits. The results pointed to the multidimensionality of the interaction between environmental, behavioral, and socioeconomic determinants and the patterns of childhood obesity. The current research highlighted the importance of specific public health measures that would fit the requirements of both urban and rural populations. The primary preventive measures that targeted healthy eating, physical activity, and awareness campaigns were necessary in curbing the increasing burden of childhood obesity in various populations.

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