JEIMP
THE SCIENCE
Journal of
European Internal Medicine Professionals
J Eur Int Med Prof
2023, Volume 1(4)

10.5281/zenodo.10019768
Original Article

Investigation of Obesity Prevalence in Adolescent Children in Şanlıurfa Province and Its Relationship with Parental Obesity

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Received: 04.10.2023 **Accepted**: 18.10.2023 **Published**: 20.10.2023

ABSTRACT

Background: Adolescent children obesity is a global public health concern, with increasing prevalence worldwide. This study aims to investigate the prevalence of adolescent children obesity in Şanlıurfa, Turkey, a region characterized by high fertility rates and relatively low socio-economic status, and to explore the demographic and lifestyle factors associated with childhood obesity.

Methods: 176 adolescent children aged 10-17 were evaluated. Data on demographics, family income, residential location, parental professions, the presence of siblings with obesity, fast food consumption, and social media usage were collected. Body Mass Index (BMI) was calculated, and children were categorized into groups based on weight status. Various statistical methods, including chi-square tests, t-tests, analysis of variance, logistic regression, and correlation analysis, were employed to analyze the data.

Results: The study found a combined prevalence of obesity and overweight in adolescent children of 22.7%. Obesity prevalence among children aged 10-17 years was found 8.5%. Children with obesity or overweight were older, had more siblings, had a greater incidence of obesity among siblings, and had a higher frequency of fast food consumption compared to their counterparts ($p<0.05$). Maternal BMI was significantly associated with adolescent children's obesity ($p<0.05$). Low family income was a notable factor in adolescent children with obesity or overweight ($p=0.019$). However, there was no statistically significant difference in obesity rates between rural and urban areas ($p=0.068$).

Conclusion: This study highlights the prevalence of adolescent obesity among children in Şanlıurfa, Turkey. Although it is relatively lower than in some other low-income regions, it aligns with global trends.

Keywords: Adolescent, obesity, Şanlıurfa, prevalence

INTRODUCTION

Obesity among adolescent children, particularly in low-income regions, has become a growing concern in public health. The World Health Organization (WHO) defines overweight and obesity as conditions characterized by abnormal or excessive fat accumulation that pose a significant risk to health (1). For older children and adolescents, different growth references are utilized. The WHO 2007 Growth Reference, for instance, is recommended for those aged 5–19 years. In this reference, overweight is defined as a BMI greater than or equal to 1 standard deviation (SD) above the median for age and sex, while obesity is defined as a BMI greater than or equal to 2 SD above the median for age and sex. The WHO 2006 Growth Standard is recommended in many countries for children aged 0–5 years, and in the United States for children aged 0–2 years (2).

Between 1975 and 2016, there was a substantial increase in the global age-standardized prevalence of obesity among children and adolescents aged 5–19 years. Specifically, for girls, this prevalence rose from 0.7% to 5.6%, while for boys, it increased from 0.9% to 7.8%. The reflections of this rapid obesity rate change in the world have also been seen in this age group in Turkey. Salman et. al reported a higher prevalence of obesity among Turkish children during the COVID-19 pandemic. In their report, the prevalence raised up to

13.6 among children over 11 years old by 2022 (3).

Previous studies from Turkey revealed a broad variation range according to cities in Turkey (4). This variation rises on variations of the socioeconomic status of the regions.

Şanlıurfa is one of the most crowded cities in Turkey and has the highest fertility rate (3.59%) (5). The child population constitutes a very significant part of the total population (~40%) (6). However, the obesity rate among Children in Şanlıurfa is unclear.

This study aims to estimate obesity among adolescent children in Şanlıurfa aged 10-17 years.

METHODS

The data of children aged 10-17 years who applied as outpatients to Şanlıurfa Training and Research Hospital Pediatric Polyclinic were examined. Children with recent illnesses that caused weight change (diarrhea, long-term infection, those who underwent surgery, children with trauma, etc.) were excluded. Data were collected from the hospital software.

The demographic characteristics of the children and their parents were noted. BMIs were calculated according to CDC reference percentile ranges and children were classified as underweight (BMI ≤5), normal weight (BMI between 5-85), overweight (BMI between 85-95), and obese (BMI ≥95) (6).

For epidemiological and clinical purposes, simple anthropometric measures are commonly employed as screening tools to assess overweight and obesity in this age group. One of the primary metrics used is Body Mass Index (BMI), calculated as weight divided by height squared (kg/m^2). BMI serves as an indirect measure of body fatness and is compared to population growth references adjusted for sex and age (7,8). Children's eating habits also were analyzed.

Statistical Analysis

Data analysis was performed using a statistical package program (SPSS for Windows version 17.0, IBM Corp., Armonk, NY, USA). The distribution of continuous variables was tested using the Kolmogorov-Smirnov test. Descriptive parameters were presented as mean ± standard deviation for parametric variables. Categorical variables were compared using the Chi-Square test. Paired-samples t-test was used to compare variables between the two groups. Parametric Pearson's correlation analysis was performed to demonstrate the correlation between variables. Two-tailed p-values <0.05 were considered statistically significant with a 95% confidence interval.

RESULTS

A total of 176 adolescent children between the ages of 10 and 17 were evaluated. The study found that 51.7% of the participants were girls, while 48.3% were boys. Among these children, 15 were classified as obese, which accounts for 8.5% of the total participants, and 25 were categorized as overweight, representing 14.2% of the sample. The combined prevalence of obese and overweight adolescent children was 22.7%, a statistically significant result (p <0.001). Furthermore, it was observed that 9 of the obese adolescent children were girls, while 6 were boys. On average, each family had a mean child count of 4.09±1.88.

The study examined the demographic characteristics of children's families based on the presence of obesity and overweight (Table 1). To facilitate the analysis, obese and overweight adolescent children were grouped together as Group 1, while the remaining participants were categorized as Group 2 (Table 2). Group 1 was found to have several distinguishing features, including older age (14.25±2.68 years in Group 1 vs. 11.06±2.02 years in Group 2), a higher number of siblings (4.89±1.46 vs. 3.92±1.76), a greater incidence of obesity among siblings (p = 0.015), and a higher frequency of fast food consumption more than once a week (29 in Group 1 vs. 42 in Group 2, p = 0.027). Additionally, the study explored the BMI of children and their parents. Children in Group 1 had a significantly higher BMI compared to those in Group 2 (p <0.001). Mothers of children in Group 1 also had higher BMIs (p= 0.042), while fathers' BMIs did not significantly differ between the two groups (p= 0.215).

Table 1. Demographic features

Gender, boys/girls, n, %	85(41.3%)/ 91(51.7%)
Age, years	12.59±1.90
Weight status, n, %	
• **Underweight**	12 (6.8%)
• **Normal weight**	124 (70.4%)
• **Overweight**	25 (14.2%)
• **Obese**	15 (8.5%)
***Family income;**	
• **Low**	73 (41.5%)
• **Moderate**	101 (57.4%)
• **High**	2 (1.1)

*: Total income was calculated for each family according to children count and total salary.

Income levels were another factor considered in the analysis. Children in Group 1 were likelier to come from families with low incomes (p = 0.019), while children in Group 2 had moderate to high family incomes.

The study also examined residential locations and found a trend towards higher obesity rates in rural areas, although this difference was not statistically significant

Table 2. Comparison of the two groups

	Group 1 (Obese + Overweight), n=40	Group 2 (Except Group 1), n=136	P value
Age, years	14.25±2.68	11.06±2.02	**0.025**
Gender, male/female, n	17/23	68/68	0.210
BMI, kg/m^2 • Child • Mother • Father	 26.87±3.89 28.68±5.37 26.34±4.53	 19.25±4.87 26.45±3.75 25.56±3.46	 **<0.001** **<0.042** 0.215
Children count, n	4.89±1.46	3.92±1.76	**0.030**
Income, yes • Low • Moderate + High	 13 27	 60 76	 **0.019**
Residential, n • Rural • Urban	 13 27	 68 68	 0.068
Profession, yes/no, n Mother Father	 10/30 38/2	 6/130 131/5	 **0.002** 0.925
Siblings with obesity, yes/no, n	8/32	5/131	**0.015**
fast food eating habit more than once a week, yes/no, n	 29/11	 42/94	 **0.027**
*Social media use habits, n • ≥ 2 hours/day • < 2 hours/day	 25 15	 22 124	 **0.035**

(p= 0.068). The profession of parents (mothers: p= 0.002, fathers: p= 0.925), the presence of siblings with obesity, and social media usage habits (more than 2 hours per day: p= 0.035) were all associated with Group 1 (obese and overweight children).

Table 2 provides an overview of the demographic characteristics of children's families categorized by the presence of obesity and overweight. Given the relatively low number of obese children, we opted to combine both obese and overweight children into a single group, referred to as Group 1, while the remaining participants were grouped under Group 2. Group 1 was older, had more siblings, and more obese siblings.

DISCUSSION

Previous research from Turkey has demonstrated a wide variation in obesity prevalence across different cities, strongly linked to socioeconomic disparities. Şanlıurfa, with its high fertility rate and a significant proportion of children in the population, presents a unique setting to study childhood obesity, yet data on obesity rates in this region remain scarce. Due to the small sample size and the localized nature of the study, it would not be appropriate to generalize these results to the entire Şanlıurfa province. However, it can be noted that this represents the prevalence only among adolescents who presented to the hospital. This study demonstrated that childhood obesity has a prevalence of 8.5% in adolescent children living in Şanlıurfa and demonstrates a lower prevalence compared to children living in other regions of Turkey.

The prevalence of childhood overweight and obesity is on the rise in numerous countries, affecting children across all age groups, from preschoolers under the age of 5 to school-aged children and adolescents between 10 and 19 years. Beyond the immediate health concerns it poses for children, childhood obesity also elevates the risk of obesity and noncommunicable diseases persisting into adulthood. This underlines the far-reaching consequences and challenges posed by this public health problem (9). Overweight and obesity in childhood is an increasing problem for the low and middleincome countries of the World (10).

The prevalence of child obesity in Turkey is increasing in line with the trends in Europe and the World (3,11). Şanlıurfa attracts attention as the most fertile city in Turkey with an average of 3.89 children per family, and according to statistics, this city is seen as a low-income and low sociocultural region. For this reason, the child population is quite dense and data on child obesity becomes important for public health planning. In our specific region of Şanlıurfa, Salman et al. reported an alarming increase in obesity prevalence among Turkish children during the COVID-19 pandemic, reaching 13.6% among children over 11 years by 2022 (12). These findings underline the urgency of addressing childhood

obesity as a pressing public health issue, particularly in low-income regions.

Our findings revealed a combined prevalence of obese and overweight adolescent children at 22.7%, a statistically significant result ($p < 0.001$). This prevalence aligns with the global trend of increasing childhood obesity rates and highlights the need for targeted interventions in Şanlıurfa to address this issue. However, obesity prevalence was relatively found low compared to other low income regions in Turkey and in the World (11,13). This is an interesting part of the study. Children in the obese or overweight group (Group 1) were older, had a higher number of siblings, a greater incidence of obesity among siblings, and a higher frequency of fast food consumption more than once a week compared to their counterparts in Group 2. These findings are consistent with existing literature on the multifaceted nature of childhood obesity and its associations with dietary habits and familial factors (12,14)

Our study also explored the BMI of children and their parents. Mothers of children in Group 1 also had higher BMIs similar to previous studies, underscoring the potential influence of familial genetics and lifestyle on childhood obesity. These results emphasize the importance of involving families in obesity prevention and management efforts (12-15). Childhood obesity is substantially associated with maternal obesity rather than father obesity, as well as in our cohort (15).

Income levels emerged as a significant factor in our analysis, with children in Group 1 more likely to come from low-income families. These findings align with previous research that highlights the impact of socioeconomic status on childhood obesity (10-14).

In summary, this clinical research study highlighted significant differences in demographics and lifestyle factors between children with obesity or overweight (Group 1) and those without (Group 2). These findings provide valuable insights into the potential risk factors and characteristics associated with childhood obesity in the studied population.

In conclusion, our study provides valuable insights into the prevalence and factors associated with childhood obesity in Şanlıurfa, shedding light on a region with limited existing data on this issue. The findings underscore the urgent need for tailored public health interventions that address the multifaceted nature of childhood obesity, including dietary habits, familial influences, and socioeconomic disparities. Further research is warranted to understand the long-term consequences of childhood obesity in this specific context and to evaluate the effectiveness of targeted intervention strategies.

Limitations of The Study

The study sample consisted of 176 adolescent children in a specific region of Turkey. While the findings provide localized insights, the relatively small sample size and the focus on a single region may limit the generalizability of the results to the broader population.The study employed a cross-sectional design, which captures data at a single point in time. This design limits the ability to establish causation or track changes in obesity prevalence over time. Longitudinal studies would provide a more comprehensive understanding of childhood obesity trends. The data relied on parental reports, particularly concerning lifestyle factors such as dietary habits and social media usage. This introduces the potential for recall bias, as responses may not accurately reflect actual behavior. Additionally, self-reported income levels may not always align with the actual financial situation. The study's exclusive focus on Şanlıurfa, a region known for specific cultural and demographic characteristics, may not fully capture the diversity of the Turkish population. Variations in dietary habits, lifestyle, and socioeconomic factors may not be represented. The study did not explore the potential impact of external factors, such as government policies, healthcare infrastructure, or regional initiatives aimed at childhood obesity prevention. These factors could significantly influence the prevalence and characteristics of childhood obesity in the region. While the study observed associations between maternal BMI and childhood obesity, paternal BMI did not show significant differences between the groups. This discrepancy requires further investigation to better understand the role of parental obesity in childhood obesity within this context. The study did not account for temporal factors, such as seasonal variations or changes in lifestyle and dietary habits over time, which can influence childhood obesity prevalence. The study relied on self-reporting for certain variables, such as social media usage and dietary habits. This approach may be susceptible to social desirability bias, where participants provide responses they believe are socially acceptable. The study did not collect data on the physical activity levels of adolescent children, which is a crucial component in understanding and addressing childhood obesity.

ETHICAL DECLARATIONS

Conflict of Interest Statement: The author declares no conflicts of interest related to this research.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval: The study protocol was approved by the Harran University Clinical Research Ethics Board (Project Number: HRU/23.18.20), and written informed consent was obtained from all participants before they participated in the study. This study was conducted in agreement with the Declaration of Helsinki-Ethical principle for medical research involving human subjects.

Informed Consent: The mothers were first informed about the study and then signed written consent forms.

Author Contributions: The authors declared that they all participated in the design, execution, and analysis of the study and that they approved the final version of the paper.

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