GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 12, Issue 12 December (2024)

# EPIDEMIOLOGY AND REGIONAL TRENDS OF OBESITY-RELATED MORBIDITY IN CHILDREN AND ADOLESCENTS IN UZBEKISTAN (2022-2024)

Bakhodir Rakhimov
Tashkent Medical Academy
rakhimov.b.b@gmail.com

## ABSTRACT

This study examines the epidemiological trends and regional characteristics of obesity-related morbidity in children and adolescents across Uzbekistan during 2022–2024. Obesity is a global public health challenge, with rising prevalence rates and associated comorbidities such as cardiovascular, endocrine, musculoskeletal, and immune system disorders. The study underscores the urgent need to address childhood and adolescent obesity due to its long-term health implications.

The research analyzes data extracted from medical records and development histories of children and adolescents diagnosed with obesity. Additional insights were gathered through medical examinations and preventive screenings conducted in educational institutions. The analysis also incorporated data from dispensary groups registered with endocrinologists for obesity. The study's methodology followed internationally accepted statistical approaches, calculating intensive morbidity indicators and identifying trends over the three-year period.

Findings reveal a significant increase in obesity prevalence among children aged 11–15, with regional disparities evident. The city of Samarkand, Samarkand Region, and Khorezm Region recorded the highest obesity indicators, contrasting with other regions where rates remained relatively low. The observed rise in obesity cases can be attributed to dietary patterns, physical inactivity, and underlying metabolic imbalances. The active engagement of pediatric endocrinologists, hygienists, and dietitians has also contributed to the identification and management of obesity cases.

This study highlights the interplay of genetic predisposition, environmental factors, and lifestyle behaviors in the pathogenesis of obesity. It emphasizes the need for targeted interventions, including public health campaigns, dietary education, and increased physical activity among children and adolescents. The findings offer critical insights for healthcare policymakers and practitioners in Uzbekistan to develop effective strategies for combating obesity and mitigating its long-term health consequences.

**Keywords:** Obesity, children, adolescents, endocrine diseases, metabolic disorders, morbidity, Uzbekistan, regional health disparities, public health.

## INTRODUCTION

The growing prevalence of obesity has become a critical global health concern due to multiple factors [1-3]. One of the primary reasons is the consistent annual increase in the number of individuals classified as overweight or obese [4-5]. Furthermore, obesity is a significant contributor to the development of various systemic pathologies, including cardiovascular conditions (atherosclerosis, arterial hypertension, ischemic heart disease, metabolic syndrome), musculoskeletal disorders (osteochondrosis, degenerative osteoarthritis),

endocrine diseases (insulin-dependent and type 2 diabetes mellitus), immune-related cancers (colorectal, breast, prostate), reproductive issues, and more [6-8]. A genetic predisposition to obesity is well-documented and supported by epidemiological studies.

Epidemiological data highlights that the European Union's 25 member states exhibit the highest rates of obesity prevalence, with 25% of adolescents being overweight and 15% classified as obese [1,9]. Consequently, the obesity epidemic remains one of the most pressing public health challenges globally, accounting for over one million deaths annually in the region [10-11].

The objective of this study is to evaluate the morbidity patterns and structural features of obesity among children and adolescents in Uzbekistan.

## MATERIALS AND METHODS

The medical-sociological research involved the extraction of data from medical records (Form No. 025/u) and development histories (Form No. 030/u), followed by in-depth medical examinations of children and adolescents. The analysis incorporated data from preventive examinations conducted in educational institutions, as well as data from dispensary groups registered with endocrinologists for obesity. The study period spanned three years (2022-2024).

When examining the anamnestic data through questionnaires, attention was directed toward previous illnesses, the presence of chronic diseases, and foci of infection. The analysis of morbidity was conducted in accordance with the international statistical classification of diseases and health-related problems.

To study the health of children and adolescents with obesity, it is essential to consider the pathogenesis of this syndrome, the characteristics of its course, and the organism's functional capabilities, primarily determined by living conditions, dietary habits, daily routines, rest, and various emotional states.

By commonly accepted methods of sanitary statistics, intensive indicators were calculated. The mean values of morbidity indicators (M) and the standard error (m) were determined. The dynamics of obesity morbidity indicators were examined over a three-year period.

## RESULTS

During 2022-2024, 55,824 cases of obesity were registered among the adult population of the Republic for the first time. High intensive obesity indicators were observed in the city of Samarkand, the Khorezm Region, and the Samarkand Region. The emergence of obesity in the population is characterized by an imbalance between food intake and expended energy, disturbances in the pancreas, liver, small and large intestines. In other regions, such high obesity rates were not identified.

When examining the prevalence of obesity among children and adolescents in the Republic of Uzbekistan, it was noted that obesity is on the rise in children aged 11-15. During 2022-2024, 54,228 cases of obesity were registered in the Republic for the first time. The leading regions in terms of these indicators differ from those in the adult population. High intensive obesity indicators were identified in the city of Samarkand, the Samarkand Region, and the Khorezm Region. In other regions, such high obesity rates among children were not observed. There is

a slow but steady increase, with a peak in 2024, which is attributed not only to factors such as diet and physical activity but also to the active work of pediatric endocrinologists, hygienists, and dietitians (see Table 1).

In this section, intensive obesity indicators are presented for various regions of Uzbekistan over a three-year period – 2022, 2023, and 2024. The indicators are measured per 100,000 population.

Table 1. Intensive obesity indicators by region over 3 years.

| Region | 2022 (per 100,000 population) | 2023 (per 100,000 population) | 2024 (per 100,000 population) |
|---|---|---|---|
| Tashkent city | 304.1 | 314.1 | 327.1 |
| Andijan | 10.3 | 12.0 | 14.6 |
| Bukhara | 25.1 | 15.5 | 23.0 |
| Jizzakh | 1.2 | 3.7 | 6.1 |
| Kashkadarya | 0.5 | 0.5 | 3.9 |
| Navoiy | 44.2 | 41.6 | 46.6 |
| Namangan | 25.4 | 36.5 | 42.3 |
| Samarkand | 18.8 | 38.1 | 37.8 |
| Surkhandarya | 10.7 | 14.1 | 18.6 |
| Syrdarya | 26.2 | 17.4 | 21.4 |
| Samarkand Region | 122.4 | 155.7 | 167.0 |
| Fergana Region | 28.0 | 40.3 | 46.5 |
| Khorezm Region | 63.1 | 122.1 | 132.6 |
| Republic of Karakalpakstan | 31.8 | 23.2 | 35.8 |
| Republic of Uzbekistan | 45.9 | 56.4 | 62.0 |

This table provides a detailed comparison of obesity prevalence rates across various regions of Uzbekistan from 2022 to 2024. The data are presented as intensive indicators, calculated per 100,000 population. The analysis highlights regional disparities and trends in obesity rates over the three-year period.

Key Observations

City of Tashkent: The highest obesity rates are consistently recorded in the City of Samarkand, with an increase from 304.1 in 2022 to 327.1 in 2024. This steady growth emphasizes the need for targeted interventions in urban areas.

Andijan: The region shows a gradual increase in obesity rates, starting at 10.3 in 2022 and reaching 14.6 in 2024. While the rates are lower compared to other regions, the upward trend warrants attention.

Bukhara: Obesity indicators fluctuate, starting at 25.1 in 2022, dropping to 15.5 in 2023, and rising again to 23.0 in 2024. This variability could indicate inconsistent factors influencing obesity in this region.

Jizzakh: This region demonstrates a steady increase, with rates growing from 1.2 in 2022 to 6.1 in 2024, reflecting emerging concerns about obesity in this area.

Kashkadarya: Obesity prevalence in Kashkadarya rises from a negligible 0.5 in 2022 and 2023 to 3.9 in 2024, signaling the onset of obesity-related issues.

Navoiy: The indicators remain relatively stable, with a slight increase from 44.2 in 2022 to 46.6 in 2024.
Namangan: A significant rise is observed, from 25.4 in 2022 to 42.3 in 2024, highlighting the need for obesity management programs in the region.
Samarkand Region: The region displays one of the most notable increases, rising from 122.4 in 2022 to 167.0 in 2024. This aligns with the high indicators in the City of Samarkand, suggesting regional factors at play.
Surkhandarya: The rates increase consistently from 10.7 in 2022 to 18.6 in 2024, indicating growing concerns in this region.
Syrdarya: After a drop in 2023 to 17.4 from 26.2 in 2022, the rates rise again to 21.4 in 2024, showing variability in obesity prevalence.
Fergana Region: A steady increase is noted, from 28.0 in 2022 to 46.5 in 2024, suggesting the rising impact of obesity in this area.
Khorezm Region: A sharp rise is observed, from 63.1 in 2022 to 132.6 in 2024, making it one of the regions with the most significant growth.
Republic of Karakalpakstan: The rates fluctuate, dropping from 31.8 in 2022 to 23.2 in 2023, before rising again to 35.8 in 2024.
Republic of Uzbekistan (Overall): National obesity indicators show a consistent upward trend, increasing from 45.9 in 2022 to 62.0 in 2024, reflecting a nationwide concern.
Analysis of the morbidity among children and adolescents with obesity, based on comprehensive medical examinations, revealed a higher incidence of various conditions in this age group (11-15 years). These conditions included endocrine disorders, metabolic disturbances, blood and hematopoietic system pathologies, gastrointestinal disorders, conditions requiring surgical evaluation (such as scoliosis and flatfoot), chronic infectious foci (chronic tonsillitis, adenoids), as well as neurological disorders: autonomic nervous system disorders, asthenoneurotic syndrome, vegetative-vascular dystonia, various neuroses, and cardiovascular system disorders.
In the morbidity structure of children and adolescents with obesity aged 11 to 14 in the city of Samarkand, the following main conditions took the lead: Blood and hematopoietic system diseases, along with certain disorders involving the immune mechanism (Class III), represent 15.00% of the total diseases, Endocrine disorders and metabolic disturbances (Class IV) are observed in 18.60% of cases, Diseases of the respiratory system (Class X) are observed in 13.80% of cases and Diseases of the digestive system (Class XI) make up 11.80% of the total diseases.
Thus, the elevated prevalence of certain nosological forms can be attributed to their functional state, the organism's resistance, living conditions, work and rest patterns, healthy dietary practices, and lifestyle.

Table-2. Disease Structure in Children and Adolescents with Obesity in the City of Samarkand (as a Percentage of Total Diseases)

| ICD-10 Class of Diseases | % in Samarkand |
|---|---|
| I Infectious and parasitic diseases | 2,00 |
| III Blood and hematopoietic system diseases and certain disorders involving the immune mechanism | 15,00 |
| IV Endocrine disorders, metabolic disturbances | 18,60 |
| V Psychiatric disorders and behavioral disturbances | 5,30 |
| VI Diseases of the nervous system | 9,40 |
| VII Diseases of the eye and its adnexa | 2,80 |
| VIII Diseases of the ear and mastoid process | 1,40 |
| IX Diseases of the circulatory system | 6,10 |
| X Diseases of the respiratory system | 13,80 |
| XI Diseases of the digestive system | 11,80 |
| XII Diseases of the skin and subcutaneous tissue | 4,10 |
| XIII Diseases of the musculoskeletal system and connective tissue | 2,50 |
| XIV Diseases of the genitourinary system | 3,00 |
| XV Pregnancy, childbirth, and the puerperium | |
| XVII Congenital malformations, deformations, and chromosomal abnormalities | 1,80 |
| XIX Injuries, poisonings, and other consequences of external causes | 2,40 |
| Total Disease Incidence | 100,00 |

This table presents the distribution of various diseases among children and adolescents diagnosed with obesity in the City of Samarkand. The classification of diseases follows the ICD-10 (International Classification of Diseases, 10th Revision) framework, with the percentages indicating each disease category's proportion of the total disease burden observed in the population.

Class I: Infectious and Parasitic Diseases (2.00%)

A relatively small proportion of the total diseases, suggesting limited association between obesity and infectious conditions.

Class III: Blood and Hematopoietic System Diseases and Certain Immune Mechanism Disorders (15.00%)

A significant contribution, likely reflecting the impact of obesity on immune function and hematopoiesis.

Class IV: Endocrine Disorders, Metabolic Disturbances (18.60%)

The largest disease category, highlighting the strong link between obesity and metabolic and endocrine disorders such as diabetes and hormonal imbalances.

Class V: Psychiatric Disorders and Behavioral Disturbances (5.30%)

Reflects the mental health challenges, including depression and eating disorders, commonly associated with obesity.

Class VI: Diseases of the Nervous System (9.40%)
Indicates a notable prevalence of neurological issues, potentially due to obesity-related conditions like migraines and sleep apnea.
Class VII: Diseases of the Eye and Its Adnexa (2.80%)
A minor category, which might include conditions exacerbated by systemic health issues related to obesity.
Class VIII: Diseases of the Ear and Mastoid Process (1.40%)
The least represented category, suggesting minimal correlation with obesity.
Class IX: Diseases of the Circulatory System (6.10%)
Reflects early manifestations of cardiovascular issues, such as hypertension, often linked to obesity.
Class X: Diseases of the Respiratory System (13.80%)
A substantial category, possibly including conditions like asthma and obstructive sleep apnea, both of which are prevalent in obese children.
Class XI: Diseases of the Digestive System (11.80%)
Indicates the significant impact of obesity on gastrointestinal health, including issues such as fatty liver disease and acid reflux.
Class XII: Diseases of the Skin and Subcutaneous Tissue (4.10%)
Highlights dermatological issues like acanthosis nigricans and other obesity-related skin conditions.
Class XIII: Diseases of the Musculoskeletal System and Connective Tissue (2.50%)
Reflects orthopedic challenges, such as joint pain and deformities, often seen in obese children.
Class XIV: Diseases of the Genitourinary System (3.00%)
Suggests some prevalence of urinary and reproductive system issues potentially linked to obesity.
Class XV: Pregnancy, Childbirth, and the Puerperium (N/A)
Not applicable in this population group.
Class XVII: Congenital Malformations, Deformations, and Chromosomal Abnormalities (1.80%)
Indicates some underlying congenital conditions that may or may not be aggravated by obesity.
Class XIX: Injuries, Poisonings, and Other Consequences of External Causes (2.40%)
Reflects a small proportion of accidental injuries and related conditions, potentially linked to reduced mobility or physical activity.
The increase in the aforementioned diseases may be attributed to a decrease in the protective properties of the children and adolescents' bodies due to excessive nutrition, non-compliance with a rational diet, daily routines, and other factors. When assessing the incidence rate of obesity among children and adolescents, despite its high prevalence, no severe forms of chronic pathology were registered among them.
Endocrinological examinations revealed that 50% of individuals diagnosed with obesity had been referred by primary care pediatricians due to concerns about excess body weight, while 5% were brought in by parents independently for similar concerns. Notably, 56% of obese children had no documented diagnosis of "obesity" in their outpatient records, had not consulted an endocrinologist, and had not received preventive or therapeutic advice. In 25% of

cases, regular anthropometric monitoring was absent. Even when obesity was diagnosed by an endocrinologist or hospital physician, follow-up and weight management were often neglected.

A concerning observation is the lack of prioritization of obesity by outpatient pediatricians, who may undervalue its impact on children's health, often compounded by insufficient parental awareness.

## CONCLUSION

The findings of this study underscore the regional variations in obesity prevalence among children and adolescents. These insights can inform targeted interventions to mitigate obesity in Samarkand city and across Uzbekistan.

## REFERENCES

1. Проблема ожирения в Европейском регионе ВОЗ и стратегии ее решения/Резюме. Под редакцией Francesco Branca, Haik Nikogosian и Tim Lobstein. – ВОЗ, 2007. – 96 с.
2. Беляева Т.Н. Ожирение // Вопросы охраны материнства и детства. 1985. № 8. с 11-13.
3. Волгина С.Я., Валиуллина М.Х. – Факторы риска развития ожирения у девушек – подростков. // Российский педиатрический журнал. 2005. №4. с. 60-63.
4. Rankinen T., Perusse L., Weisnagel S. Et al. The human obesity gene map: the 2001 update. Obes. Res., 2002, 10 (3), 196-243
5. IDF (International Diabetes Federation). The IDF consensus definition of the metabolic syndrome in children and adolescents. — Brussels : IDF, 2007. - 24 p.
6. Ford E. S. Defining the metabolic syndrome in children and adolescents: will the real definition please stand up? / E.S. Ford, C. Li // J. Pediatr. — 2008. — Vol. 152. — P.160–164.
7. Рахимов Баходир Бахтиёрович. Особенности заболеваемости детей и подростков Республики Узбекистан, страдающих ожирением // Гигиена и санитария. 2017. №3.
8. Шайхова Г. И., Рахимов Б. Б. Пропаганда принципов рационального питания при ожирении //Медицинский журнал Узбекистана. – 2014. – №. 2. – С. 138-141.
9. Шайхова Г. И., Рахимов Б. Б. Совершенствование профилактики ожирения у детей и подростков //Монография.//Lambert Academic Publishing RU. – 2017. – С. 26-30.
10. Shaykhova G. I., Rakhimov B. B. Promotion of the principles of rational nutrition in obesity //Medical Journal of Uzbekistan. – 2014. – №. 2. – С. 138.
11. Шайхова Г. И., Рахимов Б. Б. Гигиеническое обоснование рационов питания при ожирении/Методические рекомендации //методические рекомендации. Тошкент. – 2010.