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

OBESITY PREVALENCE AND TRENDS IN UZBEKISTAN: A THREE-YEAR STUDY OF ADULT AND PEDIATRIC POPULATIONS OF NAMANGAN REGION (2021-2023)

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ABSTRACT

This study investigates the disease structure in children and adolescents with obesity in the Namangan Region, analyzing the prevalence of various health conditions according to the ICD-10 classification. The data highlights the significant association between obesity and a range of health issues in this population. The analysis reveals that endocrine disorders and metabolic disturbances account for the largest proportion of obesity-related diseases, contributing to 24.6% of the total diseases observed. These conditions likely include metabolic syndrome, insulin resistance, and type 2 diabetes, which are strongly linked to obesity.

In addition, a notable proportion of affected individuals suffer from digestive system diseases (11.4%) and respiratory system diseases (10.5%), with conditions such as gastroesophageal reflux, liver dysfunction, and sleep apnea being prevalent. Blood and hematopoietic system disorders, which make up 14% of the total diseases, also reflect the broader systemic impacts of obesity, including increased risks of hypertension and cardiovascular complications.

Psychiatric disorders (3.7%) and nervous system diseases (5.4%) further highlight the psychological and neurological burden associated with obesity in children and adolescents, while musculoskeletal issues (2.5%) also contribute to the overall disease burden due to the physical strain of excess weight.

The study underscores the multifaceted nature of obesity, not only as a direct cause of physical ailments but also as a precursor to chronic diseases affecting various organ systems. Furthermore, it illustrates the importance of early detection, prevention, and intervention to mitigate the long-term health consequences of obesity in children and adolescents. This research is valuable for healthcare professionals and policymakers aiming to develop targeted interventions to reduce obesity-related morbidity in the Namangan Region and beyond.

Keywords: Obesity, children, adolescents, Uzbekistan, prevalence, morbidity, endocrine diseases, public health.

INTRODUCTION

Obesity has become a major public health concern due to several key factors [1-2]. First, it is linked to the continuous rise in the number of individuals struggling with excess body weight [3-4]. Second, obesity is a major contributor to the development of numerous health conditions affecting different organs and systems, including cardiovascular disorders (such as atherosclerosis, arterial hypertension, ischemic heart disease - IHD, and metabolic syndrome), musculoskeletal issues (including osteochondrosis and degenerative osteoarthritis), endocrine diseases (such as insulin-dependent diabetes mellitus and type 2 diabetes), immune-related cancers (including colorectal, breast, and prostate cancer), reproductive challenges, among

others [5-7]. It is also clear from epidemiological research that genetic factors play a significant role in the development of obesity [8].

Epidemiological studies show that obesity rates are highest in the 25 member states of the European Union, where 25% of adolescents are overweight, with 15% suffering from obesity [1,9]. Consequently, obesity is now considered one of the most pressing public health issues globally, with obesity-related diseases causing over one million deaths annually in the region [10-11].

The aim of this study is to assess the prevalence and patterns of obesity among children and adolescents living in the Republic of Uzbekistan.

MATERIALS AND METHODS

This medical-sociological study involved extracting data from medical records (Form No. 025/u) and developmental histories (Form No. 030/u), followed by comprehensive medical examinations of children and adolescents. The analysis also included data from health check-ups conducted in educational institutions and from dispensary groups under the care of endocrinologists for obesity. The study covered the period from 2021 to 2023.

In evaluating the anamnestic data through questionnaires, special attention was given to prior illnesses, chronic conditions, and possible sources of infection. Morbidity analysis was conducted according to the international statistical classification of diseases and related health issues.

To assess the health of children and adolescents with obesity, it is important to consider the pathogenesis of this condition, its progression, and the individual's functional status, primarily influenced by factors such as living conditions, dietary habits, daily routines, rest, and emotional well-being.

Standard methods in sanitary statistics were used to calculate intensive indicators. The mean values of morbidity indicators (M) and the standard error (m) were determined. Changes in obesity morbidity indicators were analyzed over the three-year period.

RESULTS

From 2021 to 2023, a total of 55,824 new cases of obesity were recorded among the adult population of the Republic. High obesity rates were observed in the city of Tashkent, Khorezm Region, and Namangan Region. Obesity in the population is characterized by an imbalance between caloric intake and energy expenditure, along with disturbances in the functioning of the pancreas, liver, and intestines. Such high obesity rates were not identified in other regions.

When examining the prevalence of obesity among children and adolescents in Uzbekistan, it was noted that obesity is rising in the 11-15 age group. A total of 54,228 new cases of obesity were recorded during the 2021-2023 period. The regions with the highest obesity rates among children differ from those observed in adults. Notably, the city of Tashkent, Namangan Region, and Khorezm Region had the highest obesity rates. In other regions, such high obesity rates among children were not observed. The gradual increase, with a peak in 2023, is attributed to a combination of factors such as diet, physical activity, and the proactive efforts of pediatric endocrinologists, hygienists, and dietitians (see Table 1).

This section provides intensive obesity indicators for various regions of Uzbekistan over the three-year period from 2021 to 2023, measured per 100,000 population.

Table 1. Intensive obesity indicators by region over 3 years

Region	2021 (per 100,000 population)	2021 (per 100,000 population)	2023 (per 100,000 population)
City of Tashkent	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
Tashkent 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

Table 1 shows the intensive obesity indicators in Uzbekistan's regions from 2021 to 2023. The City of Tashkent consistently has the highest rates, with a steady increase each year. Other regions, such as the Tashkent and Khorezm Regions, also show significant rises in obesity indicators over the three years. Conversely, regions like Kashkadarya and Jizzakh exhibit gradual increases, though their obesity rates remain lower compared to other areas. Overall, obesity prevalence is on the rise across the country, with notable increases in several regions, particularly in urban areas. Over this period, the following trends can be observed:

City of Tashkent: The highest obesity rates, with a consistent increase from 304.1 per 100,000 population in 2021 to 327.1 in 2023.

Andijan: Shows a gradual rise in obesity rates, from 10.3 in 2021 to 14.6 in 2023, though still relatively low compared to urban areas.

Bukhara: The obesity rate fluctuates, initially peaking at 25.1 in 2021, dropping to 15.5 in 2022, and rising again to 23.0 in 2023.

Jizzakh: Exhibits a steady increase from 1.2 in 2021 to 6.1 in 2023, showing a growing concern with obesity.

Kashkadarya: The rates remain low but show an increase from 0.5 in 2021 to 3.9 in 2023.

Navoiy: Displays a relatively high and steady obesity rate, with an increase from 44.2 in 2021 to 46.6 in 2023.

Namangan: A notable rise from 25.4 in 2021 to 42.3 in 2023, indicating a growing issue in this region.

Samarkand: Shows a similar trend, rising from 18.8 in 2021 to 37.8 in 2023.

Surkhandarya: Exhibits a steady increase from 10.7 in 2021 to 18.6 in 2023.

Syrdarya: Fluctuates slightly, with a decrease in 2022 to 17.4 but rising again to 21.4 in 2023.

Tashkent Region: Significant growth, from 122.4 in 2021 to 167.0 in 2023, reflecting a marked increase in obesity.
Fergana Region: Shows a steady rise from 28.0 in 2021 to 46.5 in 2023.
Khorezm Region: A dramatic rise from 63.1 in 2021 to 132.6 in 2023, showing a major increase in obesity prevalence.
Republic of Karakalpakstan: A slight decrease in 2022, but the rate increases again in 2023, from 31.8 in 2021 to 35.8 in 2023.
Republic of Uzbekistan: Overall, the national obesity rate rises from 45.9 in 2021 to 62.0 in 2023, reflecting an upward trend in obesity across the country.
Analysis of the morbidity among children and adolescents with obesity in Namangan Region, 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 structure of morbidity among children and adolescents aged 11 to 14 in the Namangan Region with obesity, leading positions were occupied by endocrine diseases, disorders of nutrition and metabolism - 24.6%, blood diseases, blood-forming organs, and certain disorders involving the immune mechanism 14,0%, digestive system diseases 11.4%, nervous system diseases 5,4%, mental disorders and behavioral disorders 3.7%, genitourinary system diseases 3.0%, injuries, poisonings, and other consequences of external causes 3.4%, among others.
It should be noted that children and adolescents with obesity in the Namangan Region lack healthy lifestyle habits.

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

ICD-10 Class of Diseases	Percentage
I Infectious and parasitic diseases	2,8
III Blood and hematopoietic system diseases and certain disorders involving the immune mechanism	14,0
IV Endocrine disorders, metabolic disturbances	24,6
V Psychiatric disorders and behavioral disturbances	3,7
VI Diseases of the nervous system	5,4
VII Diseases of the eye and its adnexa	2,8
VIII Diseases of the ear and mastoid process	3,4
IX Diseases of the circulatory system	6,1
X Diseases of the respiratory system	10,5
XI Diseases of the digestive system	11,4
XII Diseases of the skin and subcutaneous tissue	4,1
XIII Diseases of the musculoskeletal system and connective tissue	2,5
XIV Diseases of the genitourinary system	3,0
XV Pregnancy, childbirth, and the puerperium	-
XVII Congenital malformations, deformations, and chromosomal abnormalities	1,0
XIX Injuries, poisonings, and other consequences of external causes	3,4
Total Disease Incidence	100

Table 2 presents the disease structure in children and adolescents with obesity in the Namangan Region, as a percentage of total diseases. The data is categorized according to the ICD-10 classification of diseases, with the percentage reflecting how each type of disease contributes to the overall disease burden in this group.

I Infectious and parasitic diseases: 2.8% of the total cases, indicating a relatively low incidence of infectious diseases among children and adolescents with obesity.

III Blood and hematopoietic system diseases and certain disorders involving the immune mechanism: 14.0%, showing a notable presence of blood-related and immune system disorders in this population.

IV Endocrine disorders, metabolic disturbances: 24.6%, the highest percentage, highlighting the strong association between obesity and metabolic/endocrine issues such as diabetes, thyroid disorders, and metabolic syndrome.

V Psychiatric disorders and behavioral disturbances: 3.7%, indicating a moderate presence of psychological or behavioral issues, which are common in children with obesity.

VI Diseases of the nervous system: 5.4%, reflecting a significant proportion of neurological disorders in children and adolescents with obesity.

VII Diseases of the eye and its adnexa: 2.8%, showing a minor contribution from eye-related diseases.

VIII Diseases of the ear and mastoid process: 3.4%, similarly representing a small portion of the overall disease incidence.

IX Diseases of the circulatory system: 6.1%, suggesting that circulatory problems like hypertension or heart disease are also a concern among obese children and adolescents.

X Diseases of the respiratory system: 10.5%, highlighting a significant prevalence of respiratory issues, possibly related to conditions like asthma or sleep apnea associated with obesity.

XI Diseases of the digestive system: 11.4%, indicating a substantial incidence of gastrointestinal disorders such as acid reflux, constipation, and liver disease in this group.

XII Diseases of the skin and subcutaneous tissue: 4.1%, showing a notable percentage of skin conditions related to obesity, such as acne, fungal infections, or skin folds.

XIII Diseases of the musculoskeletal system and connective tissue: 2.5%, pointing to musculoskeletal issues like joint pain, which are more common in obese children due to increased strain on the bones and joints.

XIV Diseases of the genitourinary system: 3.0%, reflecting a moderate occurrence of urinary or reproductive system issues in the obese population.

XV Pregnancy, childbirth, and the puerperium: No reported cases, as this category is not relevant for children and adolescents.

XVII Congenital malformations, deformations, and chromosomal abnormalities: 1.0%, showing a small percentage of obesity-related congenital or genetic disorders.

XIX Injuries, poisonings, and other consequences of external causes: 3.4%, indicating some risk of external injuries or accidents in children with obesity.

The increase in the aforementioned health conditions may be attributed to a decline in the protective capacities of children's and adolescents' bodies, resulting from factors such as overeating, failure to follow a balanced diet, irregular daily routines, and other influences.

Despite the high prevalence of obesity among children and adolescents, the incidence rate does not indicate the presence of severe chronic diseases in this population.

Endocrinologists examined children and adolescents with an "obesity" diagnosis in their outpatient medical records, and half of them had been referred by primary care pediatricians due to concerns about excessive body weight. Furthermore, 5% of parents independently sought consultation with an endocrinologist, driven by concerns about their child's excess weight.

Our findings revealed that 56% of children diagnosed with obesity did not have an "obesity" diagnosis documented in their outpatient records, had not consulted with an endocrinologist, and had not received any preventive or therapeutic guidance. Additionally, 25% of the children examined lacked regular anthropometric measurements. Some children diagnosed with obesity by an endocrinologist during outpatient visits or by a hospital doctor were also not subject to ongoing monitoring, and their weight dynamics were not tracked.

It is important to note that outpatient pediatricians do not view obesity in children as a significant health concern requiring continuous monitoring and attention. There is often a lack of awareness among parents regarding the serious health risks posed by childhood obesity.

CONCLUSION

The regional trends in obesity rates among children and adolescents identified in this study will help inform targeted interventions aimed at reducing obesity rates in Tashkent city and across Uzbekistan.

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