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ANALYSIS OF OBESITY TRENDS AND ASSOCIATED HEALTH CONDITIONS IN YOUTHS AND ADOLESCENTS IN THE ANDIJAN REGION

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ABSTRACT

Obesity is a growing global health concern, with significant implications for various bodily systems, including cardiovascular, musculoskeletal, endocrine, and immune-related disorders. It is increasingly prevalent among children and adolescents, contributing to a range of chronic health conditions and affecting their quality of life. This study aims to analyze the prevalence and structure of obesity among children and adolescents in the Republic of Uzbekistan over a three-year period (2021–2023). The research focuses on the distribution of obesity cases across different regions, including Tashkent City, Tashkent Region, and Khorezm Region, which exhibit the highest obesity rates.

Data was collected from medical records (Form No. 025/u), medical histories (Form No. 030/u), health check-ups in educational institutions, and dispensary group records managed by endocrinologists. Special attention was given to the syndromic pathogenesis of obesity, considering factors such as living conditions, dietary habits, physical activity, and emotional health. Statistical analysis, including morbidity indicators and intensity measures, was performed to assess trends in obesity prevalence and associated health conditions.

Results indicate that from 2021 to 2023, 55,824 new adult obesity cases were recorded in Uzbekistan, with Tashkent City, Khorezm Region, and Tashkent Region having the highest rates. Among children and adolescents aged 11-15, 54,228 new cases were registered, with a steady increase observed in Tashkent City and surrounding regions. The upward trend is attributed to changes in dietary patterns, reduced physical activity, and increased awareness and intervention by pediatric specialists.

This study provides valuable insights into the regional variations in obesity rates and highlights the need for targeted health initiatives to address this pressing issue in Uzbekistan, particularly in vulnerable populations such as children and adolescents.

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

INTRODUCTION

Obesity has become a topic of considerable concern due to several critical factors [1-2]. First, it is linked to an annual rise in the number of individuals struggling with excessive body weight [3-4]. Second, obesity consistently contributes to the onset of various health issues affecting multiple bodily organs and systems, including cardiovascular disorders (e.g., atherosclerosis, arterial hypertension, ischemic heart disease (IHD), and metabolic syndrome), musculoskeletal conditions (e.g., osteochondrosis and degenerative osteoarthritis), endocrine dysfunctions (e.g., insulin-dependent diabetes mellitus and type 2 diabetes mellitus), immune-related diseases (e.g., colorectal, breast, and prostate cancers), reproductive issues, and others

[5-7]. A genetic predisposition to obesity has also been confirmed through epidemiological research [8].

Studies show that obesity prevalence is highest in the 25 member states of the European Union, where 25% of adolescents are overweight and 15% are obese [1,9]. As such, obesity has become one of the most pressing global public health concerns. Annually, obesity-related illnesses result in more than one million deaths across the region [10-11].

This study aims to analyze the prevalence and structure of obesity among children and adolescents in the Republic of Uzbekistan.

MATERIALS AND METHODS

The study involved collecting data from medical records (Form No. 025/u) and medical histories (Form No. 030/u), supplemented by detailed medical examinations of children and adolescents. It incorporated health check-up data from educational institutions and dispensary group records managed by endocrinologists for obesity cases. This study covered a three-year period from 2021 to 2023.

When analyzing questionnaire data, particular focus was placed on prior illnesses, chronic conditions, and sources of infection. Morbidity data were evaluated based on the international statistical classification of diseases.

The health of obese children and adolescents was assessed considering the syndrome's pathogenesis, its progression, and the body's functional capacity, influenced by living conditions, dietary habits, routines, rest, and emotional states. Standard sanitary statistical methods were used to calculate intensity indicators, mean morbidity (M), and standard error (m). Changes in obesity morbidity indicators over three years were also studied.

RESULTS

Between 2021 and 2023, the Republic documented 55,824 new cases of obesity in adults. Regions with the highest rates included the city of Tashkent, Khorezm Region, and Tashkent Region. The onset of obesity is primarily characterized by a mismatch between calorie intake and energy expenditure, alongside functional disturbances in the pancreas, liver, and intestines. Such levels were less pronounced in other regions.

In children and adolescents aged 11-15, obesity prevalence has shown a steady increase. From 2021 to 2023, 54,228 new cases were registered in this age group. Unlike adult obesity, high rates in children were most prevalent in Tashkent City, Tashkent Region, and Khorezm Region. The upward trend, peaking in 2023, was influenced by dietary patterns, physical activity, and the proactive efforts of pediatric endocrinologists, hygienists, and dietitians (see Table 1).

This section provides detailed obesity intensity indicators across Uzbekistan’s regions for the period 2021–2023, expressed per 100,000 population.

Table 1. Intensive obesity indicators by region over 3 years

Region	2021 (per 100,000 population)	2022 (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
Ferghana 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 presents the prevalence of obesity, measured as the number of cases per 100,000 population, across various regions of Uzbekistan over a three-year period (2021–2023). The data highlights regional differences and trends in obesity prevalence.

The City of Tashkent consistently recorded the highest obesity prevalence among all regions. The rate increased annually: 304.1 in 2021, 314.1 in 2022, and 327.1 in 2023, demonstrating a steady upward trend.

Obesity prevalence in Andijan showed a significant increase over three years, starting at 10.3 in 2021 and rising to 14.6 in 2023.

Bukhara experienced fluctuations, with a decrease from 25.1 in 2021 to 15.5 in 2022, followed by a rebound to 23.0 in 2023.

Obesity rates in Jizzakh were among the lowest but displayed a consistent rise, from 1.2 in 2021 to 6.1 in 2023.

Kashkadarya also had very low obesity prevalence, starting at 0.5 in both 2021 and 2022 but increasing to 3.9 in 2023.

Navoiy maintained relatively high rates, ranging from 44.2 in 2021 to 46.6 in 2023, with minor variations.

Namangan exhibited a sharp increase in obesity prevalence, starting at 25.4 in 2021 and reaching 42.3 in 2023.

The rate in Samarkand rose significantly between 2021 (18.8) and 2022 (38.1) but slightly declined to 37.8 in 2023.

Surkhandarya demonstrated a steady increase, from 10.7 in 2021 to 18.6 in 2023.

Obesity prevalence fluctuated in Syrdarya, with a decrease from 26.2 in 2021 to 17.4 in 2022, followed by an increase to 21.4 in 2023.

The Tashkent Region showed a pronounced upward trend, increasing from 122.4 in 2021 to 167.0 in 2023, consistently ranking among the highest in obesity rates.

Ferghana experienced a significant increase, starting at 28.0 in 2021 and reaching 46.5 in 2023.

Khorezm showed a sharp rise in obesity prevalence, from 63.1 in 2021 to 132.6 in 2023, marking one of the steepest increases among all regions.

Karakalpakstan's rates fluctuated, decreasing from 31.8 in 2021 to 23.2 in 2022, then increasing to 35.8 in 2023.

Across Uzbekistan, the national average for obesity prevalence showed a steady increase, from 45.9 in 2021 to 62.0 in 2023.

An examination of the morbidity rates among children and adolescents with obesity in the Andijan Region, conducted through thorough medical assessments, revealed a higher incidence of various conditions in this age group (11-15 years). These conditions encompassed endocrine disorders, metabolic irregularities, pathologies related to the blood and hematopoietic system, gastrointestinal issues, conditions necessitating surgical evaluation (such as scoliosis and flatfoot), chronic infectious sources (like chronic tonsillitis and adenoids), as well as neurological disorders including autonomic nervous system disorders, asthenoneurotic syndrome, vegetative-vascular dystonia, various neuroses, and cardiovascular system disorders.

An examination of the illness patterns among children and adolescents with obesity in the Andijan Region indicated that the most prominent health issues included endocrine disorders, eating problems, and metabolic irregularities, accounting for 29.6% of cases among obese children. Conditions related to the digestive system constituted 10.4% of cases, blood disorders and issues with hematopoietic organs were present in 13.0% of cases, neurological disorders were observed in 5.4% of cases, with mental health disorders and behavioral problems at 3.3%. Additionally, genitourinary system diseases accounted for 3.0% of cases, while injuries, poisonings, and other effects of external factors represented 3.4% of cases. Diseases affecting the skin and subcutaneous tissue, the circulatory system, and the musculoskeletal system were present in 4.1% and 2.5% of cases, respectively.

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

ICD-10 Class of Diseases	Percentage
I Infectious and parasitic diseases	3,0
III Blood and hematopoietic system diseases and certain disorders involving the immune mechanism	13,0
IV Endocrine disorders, metabolic disturbances	29,6
V Psychiatric disorders and behavioral disturbances	3,3
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	11,0
XI Diseases of the digestive system	10,4
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	1,8
XIX Injuries, poisonings, and other consequences of external causes	3,4
Total Disease Incidence	100

This table presents the distribution of diseases among children and adolescents diagnosed with obesity in the Andijan Region. The diseases are categorized by classes according to the International Classification of Diseases, 10th Revision (ICD-10), and their occurrence is expressed as a percentage of the total disease incidence in this population.

High-Prevalence Disease Classes

Class IV: Endocrine Disorders, Metabolic Disturbances (29.6%)

Endocrine and metabolic disorders constitute the most prevalent disease class, highlighting the significant association between obesity and conditions such as diabetes and other metabolic issues.

Class III: Blood and Hematopoietic System Diseases, and Certain Immune Disorders (13.0%)

Disorders of blood and the immune system represent the second-largest category, likely reflecting the systemic effects of obesity on immune function.

Class X: Diseases of the Respiratory System (11.0%)

Respiratory diseases are also highly prevalent, potentially due to obesity's impact on lung function and increased susceptibility to conditions like asthma.

Class XI: Diseases of the Digestive System (10.4%)

Digestive disorders are notably common, indicating the influence of obesity on gastrointestinal health.

Moderate-Prevalence Disease Classes

Class IX: Diseases of the Circulatory System (6.1%)

Cardiovascular diseases, a well-documented consequence of obesity, form a significant portion of the disease burden.

Class VI: Diseases of the Nervous System (5.4%)

Nervous system disorders may include conditions exacerbated by obesity, such as neuropathies or stress-related issues.

Class XII: Diseases of the Skin and Subcutaneous Tissue (4.1%)

Obesity-related dermatological conditions, such as acanthosis nigricans, are reflected in this percentage.

Low-Prevalence Disease Classes

Class V: Psychiatric Disorders and Behavioral Disturbances (3.3%)

Mental health conditions, while less prevalent, are still notable due to the psychological impact of obesity.

Class I: Infectious and Parasitic Diseases (3.0%)

The prevalence of infectious diseases may be linked to compromised immune responses in obese individuals.

Class XIV: Diseases of the Genitourinary System (3.0%)

These include obesity-related conditions such as urinary incontinence or hormonal disruptions affecting reproductive health.

Class VIII: Diseases of the Ear and Mastoid Process (3.4%)

Ear-related conditions may not be directly linked to obesity but represent part of the overall disease structure.

Class XIX: Injuries, Poisonings, and Other External Causes (3.4%)

Injuries may reflect the increased physical strain and reduced mobility associated with obesity.

Class XIII: Diseases of the Musculoskeletal System and Connective Tissue (2.5%)

The relatively low percentage highlights joint and skeletal issues, such as osteoarthritis, which are common in obese populations.

Class VII: Diseases of the Eye and Adnexa (2.8%)

This category may reflect conditions like obesity-related retinopathy or general ocular health issues.

Rare or Negligible Disease Classes

Class XVII: Congenital Malformations, Deformations, and Chromosomal Abnormalities (1.8%)

While rare, congenital conditions are part of the disease burden.

Class XV: Pregnancy, Childbirth, and the Puerperium (-)

This category is irrelevant for the study population of children and adolescents.

Total Disease Incidence

The total percentage sums to 100%, providing a complete distribution of diseases across all classes.

The increase in the aforementioned diseases can be attributed to a decline in the protective functions of children and adolescents' bodies, primarily caused by poor nutrition, failure to adhere to a balanced diet, irregular daily routines, and other contributing factors. Despite the high prevalence of obesity, no severe chronic conditions were observed among the children and adolescents when evaluating obesity rates.

Endocrinologists examined children diagnosed with obesity in their outpatient medical records, and 50% of these cases were referred by primary care pediatricians specifically for concerns about excessive body weight. Additionally, 5% of the children's parents independently sought an endocrinologist's consultation due to worries about their child's weight.

It was found that 56% of the children with obesity in the study had no formal "obesity" diagnosis in their outpatient records, had not been seen by an endocrinologist, and thus had not received any preventive or therapeutic advice. In 25% of the children examined, no regular anthropometric measurements were available. Children diagnosed with "obesity" by an endocrinologist during outpatient visits or by a hospital physician were also not subject to continuous monitoring, and their weight dynamics were not tracked.

It is important to note that outpatient pediatricians do not view childhood obesity as a significant health issue that requires continuous monitoring and attention. This may also reflect a lack of awareness among the parents of children with obesity.

CONCLUSION

The regional patterns of obesity incidence among children and adolescents identified in this study will support the development of targeted strategies to reduce obesity in Tashkent city and throughout Uzbekistan.

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