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**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

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STATUS OF CHILDREN'S OBESITY IN AZERBAIJAN BASED ON THE RESULTS OF THE COSI PROJECT

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✓ Resume

The article presents the results of the status studying assessment of obesity among children in Baku and in the regions of Republic. The purpose of the study is to monitor the prevalence of obesity among children in Baku and to identify risk factors. The study was conducted on the basis of a semi-vertical design. The epidemiological control system included school children aged 6.0-6.9, 7.0-7.9, 8.0-8.9 and 9.0-9.9. The selection was made in accordance with the COSI protocol of the WHO European regional office. A two-stage stratified cluster sampling method was used as primary sampling elements were schools, and secondary sampling elements were third classes.

2827 8-year-old children were examined in 128 elementary schools, including 1527 boys (54%) and 1300 girls (46%). In total, 128 schools from 12 regions, including 56 urban and 72 rural schools, were included in the national sample.

The number of children participating in the research in Baku city was 965 (500 of them were boys and 465 were girls).

According to the results of the COSI study in Azerbaijan, the prevalence of thinness among 8-year-old children in Baku was 4.1%, overweight (including obesity) was 34.8%, and obesity alone was 14.6% (proposed by WHO in 2007 according to the criteria of physical development).

Key words: obesity; children; childhood obesity; surveillance initiative; epidemiological surveillance

СОСТОЯНИЕ ДЕТСКОГО ОЖИРЕНИЯ В АЗЕРБАЙДЖАНЕ ПО РЕЗУЛЬТАТАМ ПРОЕКТА COSI

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✓ Резюме

В статье представлены результаты оценки состояния ожирения среди детей в г. Баку и регионах республики. Целью исследования является мониторинг распространенности ожирения среди детей в г. Баку и выявление факторов риска. Исследование проводилось на основе полуввертикального дизайна. В систему эпидемиологического контроля были

включены школьники в возрасте 6,0-6,9, 7,0-7,9, 8,0-8,9 и 9,0-9,9 лет. Отбор производился в соответствии с протоколом COSI Европейского регионального бюро ВОЗ. Использовался метод двухступенчатой стратифицированной кластерной выборки, в качестве первичных элементов выборки выступали школы, а вторичных элементов выборки - третьи классы.

Обследовано 2827 детей в возрасте 8 лет в 128 начальных школах, в том числе 1527 мальчиков (54%) и 1300 девочек (46%). Всего в национальную выборку было включено 128 школ из 12 регионов, в том числе 56 городских и 72 сельских школ.

Число детей, принявших участие в исследовании в городе Баку, составило 965 человек (из них 500 мальчиков и 465 девочек).

По результатам исследования COSI в Азербайджане распространенность худобы среди 8-летних детей в Баку составила 4,1%, избыточного веса (включая ожирение) — 34,8%, а только ожирения — 14,6% (предложено ВОЗ в 2007 году по критериям физического развития).

Ключевые слова: ожирение; дети; детское ожирение; инициатива по надзору; эпидемиологический надзор

COSI LOYIHASI NATIJALARI BO'YICHA AZARBAYJONDA BOLALARDAGI SEMIZLIK HOLATI

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✓ Rezyume

Maqolada Boku va respublika viloyatlarida bolalar o'rtasida semirish holatini baholash natijalari keltirilgan. Tadqiqotning maqsadi Boku shahridagi bolalar orasida semirishning tarqalishini kuzatish va xavf omillarini aniqlashdir. Tadqiqot yarim vertikal loyiha asosida olib borildi. Epidemiologik nazorat tizimiga 6,0-6,9, 7,0-7,9, 8,0-8,9 va 9,0-9,9 yoshdagi maktab o'quvchilari kiritilgan. Tanlov JSST Yevropa mintaqaviy byurosining COSI protokoliga muvofiq amalga oshirildi. Ikki bosqichli tabaqalashtirilgan klaster tanlama usuli qo'llanildi, maktablar birlamchi tanlama birliklari va uchinchi sinflar ikkinchi darajali tanlama birliklari sifatida. 128 ta boshlang'ich maktabda jami 2827 nafar 8 yoshli bolalar, jumladan, 1527 nafar o'g'il (54 foiz) va 1300 nafar qiz (46 foiz) o'rganildi. Respublika tanloviga 12 ta hududdan jami 128 ta maktab, jumladan, 56 ta shahar va 72 ta qishloq maktablari kiritilgan.

128 ta boshlang'ich maktabda jami 2827 nafar 8 yoshli bolalar ko'rikdan o'tkazildi, ulardan 1527 nafari o'g'il bolalar (54%) va 1300 nafari qizlar (46%). Respublika tanloviga 12 ta hududdan jami 128 ta maktab, jumladan, 56 ta shahar va 72 ta qishloq maktablari kiritilgan.

Bokudagi o'qishda qatnashgan bolalar soni 965 nafarni tashkil etdi (shundan 500 nafari o'g'il va 465 nafari qiz).

Ozarbayjondagi COSI tadqiqoti natijalariga ko'ra, Bokuda 8 yoshli bolalar o'rtasida ozg'inlikning tarqalishi 4,1% ni, ortiqcha vazn (shu jumladan semizlik) - 34,8% va faqat semizlik - 14,6% (Jismoniy rivojlanish mezonlari bo'yicha JSST tomonidan 2007 yilda taklif qilingan).

Kalit so'zlar: semizlik; bolalar; bolalik semizligi; kuzatuv tashabbusi; epidemiologik nazorat

Relevance

Non-communicable diseases (NCDs) have become the most important public health problem in the new millennium, and the global "Strategy Note on the Control of Non-communicable Diseases in the Republic of Azerbaijan for 2015-2020" approved by the Decree of the President of the Republic of Azerbaijan dated December 23, 2015 - very important for the control of infectious diseases. The World

Health Organization (WHO) conducted a STEPS survey in the European region, including Azerbaijan, to control and combat non-communicable diseases (2011). In addition, since 2005, the Children Obesity Surveillance Initiative (COSI) has been investigating overweight and underweight trends among school-age children. In 2007-2008, 268 thousand children were surveyed with the participation of 12 countries. The VI round of the project, which will be conducted in 2021-2023, involves about 40 countries, and the analysis of survey data conducted among children aged 6-9 years in each country is being carried out.

The current research work is an epidemiological analysis of the survey results conducted within the framework of the COSI project.

The purpose of the research work was to determine the prevalence of overweight and obesity among children aged 6.0-9.9 years in Baku city and some regions.

Materials and methods of the study:

The current research work was carried out in a complex with the Center for Public Health and Reforms of the Ministry of Health of the Republic of Azerbaijan.

The studies were designed on the basis of a semi-vertical design. The epidemiological surveillance system covered schoolchildren aged 6.0-6.9; 7.0-7.9; 8.0-8.9 and 9.0-9.9, that is, cohorts that are more sensitive to environmental influences and show the highest frequency of increase in obesity or overweight.

The choice of these 4 age groups was due to the following reasons: it is before puberty and eliminates the various differences in the adolescent period between countries. In addition, obesity detected at this age also manifests itself as a prognostic factor in older ages. Finally, a re-increase in adipose tissue is observed by the age of 6.

The selection was carried out in accordance with the COSI protocol of the WHO Regional Office for Europe. The primary sampling elements were schools, and the secondary sampling elements were the third grades of schools, using a two-stage stratified cluster sampling method.

The measurements were conducted among school students. At this time, both the children and the environment in which they constantly live (home) and work (school, clubs) were evaluated. In the process, the main (mandatory) and optional (voluntary) items were answered.

	Core (mandatory)	Optional (voluntary)
Assessment of children	Individual number, age, gender, degree of urbanization, information on nutrition, date and time of measurements, consent to measuring the child's weight and height, anthropometric assessment	Name, surname, patronymic, age (in months), address, population of the region where the child lives, if the child is against the measurement, the reason must be indicated. Average height, waist and hip circumference. Co-occurring diseases, assessment of the diet. Assessment of physical activity. Socio-economic characteristics of the family
School assessment	School code number, child's functions at school. Availability of indoor and outdoor gyms, sports lessons. Food availability, school cafeteria	More detailed listing of physical activity, preparation of sports events. Availability of school bus. Student's walking, cycling, skating to class.

Body mass index (BMI) was calculated using the following formula:

$$\text{BMI} = \text{weight} / \text{height}^2$$

0-18 – underweight

18.5 – 24.9 – Normal

25.0 – 29.9 – Overweight (body weight “above normal” for height)
 30.0 and above – Obesity (body weight “above normal” for height).

Results and Discussion

The 3rd graders in the schools were randomly selected, where the height and body weight of all students, regardless of their age (the main age range of students was 7-9 years), were measured. Measurements were taken of children who did not attend classes, as well as of children whose parents did not agree to participate in the study or who refused to participate themselves (Table 1).

Table 1.
 Age distribution of 3rd graders participating in the study

Age	7	8	9	10	11	Total
Number (N)	1	2827	1907	78	7	4820
%	0,0	58,7	39,6	1,6	0,1	100

Thus, the target group was 8-year-old primary school students.

According to the international protocol, the minimum final effective sample size should be 2800 children (1400 girls and 1400 boys) in the target age group.

Thus, the number of students on the list for the country sample was 4820, of which 2827 were 8-year-olds: 1512 boys (53.5%) and 1315 girls (46.5%) (Figure 1).

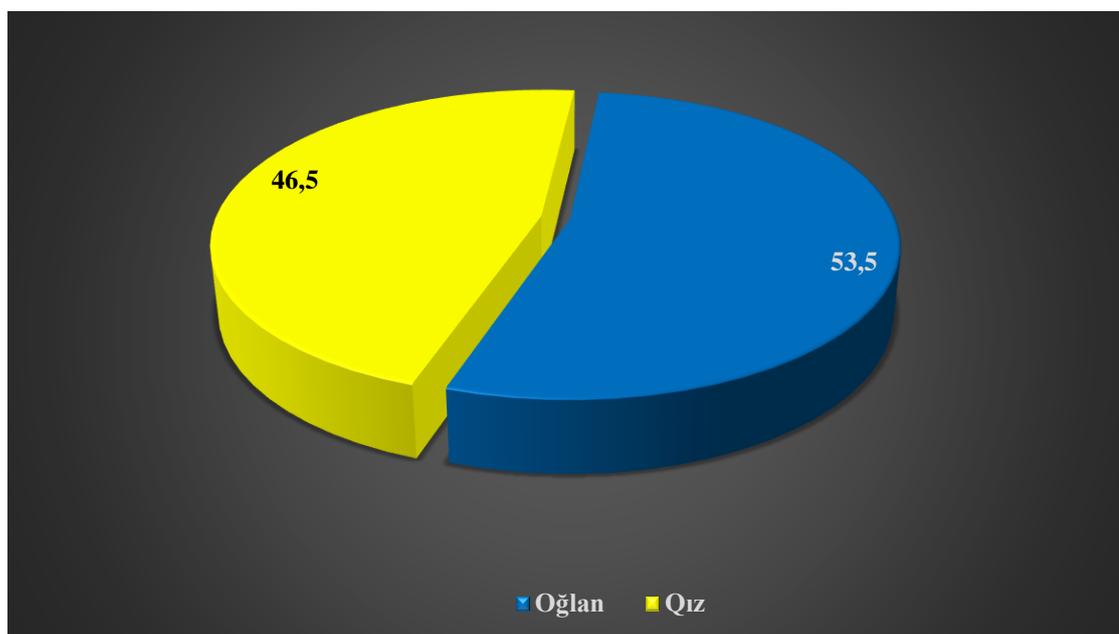


Image 1.

Distribution of children involved in the study by gender (%)

In the selected 8-year-old cohort, anthropometric indicators, nutrition and physical activity data were analyzed by gender, city/rural and region.

Table 2 shows the results of anthropometric measurements (body weight (kg), height (cm) and BMI kg/m²) of the selected cohort in Baku city. The average indicators were slightly higher in boys (500 people) than in girls (465 people) (body weight - 30.6 kg and 29.8 kg, respectively; height - 131.8 cm and 131.2 cm). During the study, the tallest children with a height of 135.5 cm (average indicator 130.9



cm) and the highest body weight with an indicator of 30.2 kg (average indicator 28.3 kg) live in Baku city. The average BMI is also the highest in Baku city - 17.3 kg/m².

Table 2 Distribution of average body weight, height and BMI in children in Baku city

Region		Boys			Girls			Total		
		Body weight kg	Height cm	BMI kg/m ²	Body weight kg	Height cm	BMI kg/m ²	Body weight kg	Height cm	BMI kg/m ²
Baku	n	500	500	500	465	465	465	965	965	965
	middle	30,6	131,8	17,4	29,8	131,2	17,2	30,2	131,5	17,3

The study found that 3.4% of children in Baku have low body mass for their age, 1.2% have short stature for their age, and 1.5% have low body weight for their age (Figure 2).

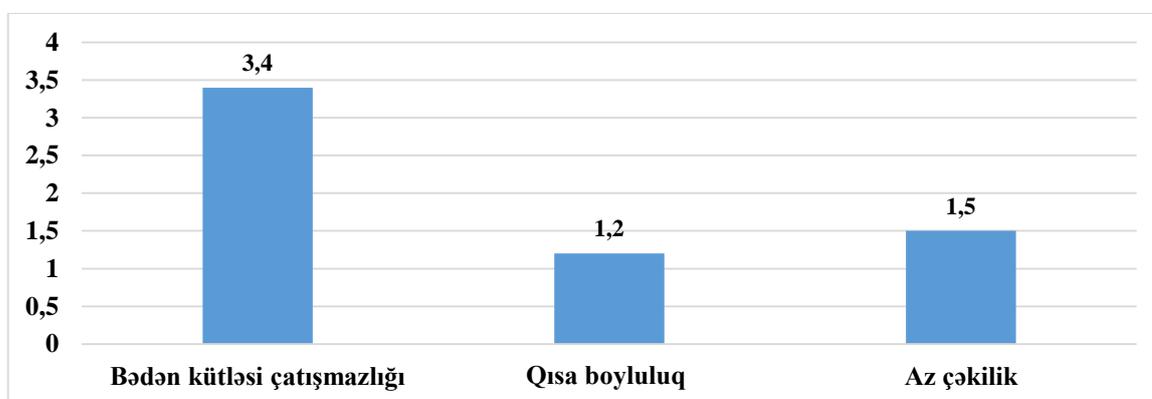


Figure 2. Prevalence of underweight, stunting and underweight in Baku city (%)

In contrast, data on nutritional status show that overweight (including obesity) is 34.8% in Baku city, while the burden of obesity alone is 14.6% (Figure 3).

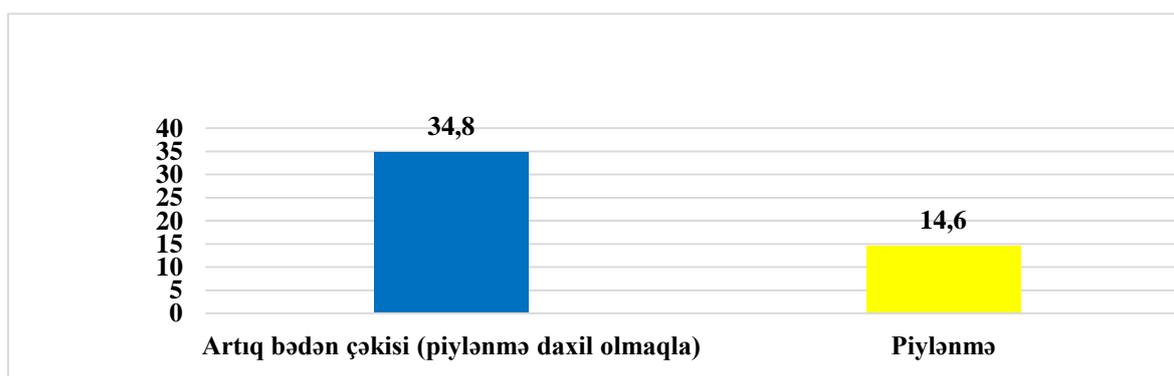


Figure 3. Overweight (including obesity) and obesity burden (%) in Baku city

* Appendix

Within the framework of the COSI project, a survey was conducted among children aged 6-9 in cities and districts belonging to 11 other regions of the republic (Absheron-Khizi, Guba-Khachmaz, Mil-Mugan, Karabakh, Sheki-Zagatala, Daglyg Shirvan, Lankaran-Astara, Shirvan-Salyan, Gazakh-Tovuz,

Ganja-Dashkan and Central Aran) in addition to Baku, and the degree of urbanization (urban/rural) was analyzed as a stratification variable (table).

Table 3 Comparison of children participating in the COSI project study

Degree of urbanization	Number of children participating in the study (weekly)	Number of 8-year-old children participating in the study (weekly)
Republic	4820	2827
Baku city	2001	965
City	2880	1491
Village	1940	1336

In total, 128 schools from 12 regions, including Baku, were included in the sample, including 56 urban and 72 rural schools. (Table 4).

Table 4. National sample for the COSI project

Samples participating in the selection	Number of samples (weeks)
Schools	128
Students	2827
Parents	2398

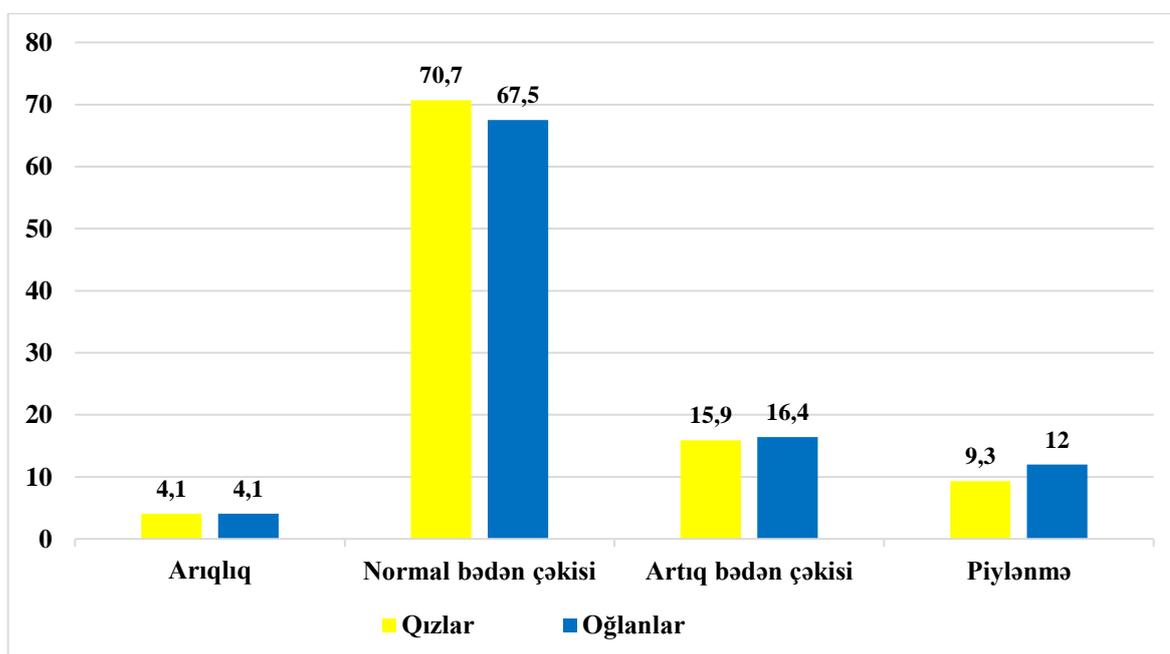


Figure 4. Prevalence of BMI by gender (%)

In accordance with the recommendations of the WHO Regional Office for Europe, a two-level stratified sampling was conducted and 4 categories were defined as strata:

- Baku city;
- Districts with an urban-rural population ratio of less than 40%;
- Districts with an urban-rural population ratio of 50-70%;
- Districts with an urban-rural population ratio of at least 70%.

In the first stage, schools were selected, and in the second stage, classes. On average, two classes were selected from each school.

According to the conducted studies, there was a difference between girls and boys in BMI except for one person (underweight 4.1%). For example, there were more girls with normal body weight than boys (70.7% and 67.5%, respectively). Overweight and obesity were most often noted in boys (16.4% and 12%, and 15.9% and 9.3%, respectively) (Figure 4).

Results:

1. According to the results of the “National Survey on Risk Factors of Non-Communicable Diseases”, 62.7% of adults have at least 1-2 risk factors for the development of NCDs, and 32.4% have three or more risk factors.

2. The number of children participating in the study in Baku was 965 (500 of whom were boys and 465 were girls).

3. According to the results of the COSI study in Azerbaijan, the prevalence of underweight among 8-year-old children in Baku was 4.1%, overweight (including obesity) – 34.8%, and obesity alone was 14.6% (according to the physical development criteria proposed by WHO in 2007).

4. The prevalence of overweight was higher among boys than among girls (28.4% and 25.2%, respectively).

5. 128 schools from 12 regions of the republic, including Baku, were included in the national sample, including 56 urban and 72 rural schools.

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