

ASSESSMENT AND ANALYSIS OF ANTHROPOMETRIC INDICATORS IN UNIVERSITY STUDENTS OF KARSHI CITY

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Abstract. This study investigated anthropometric indicators among 123 university students in Karshi city. The measurements included body height, body weight, chest circumference, waist and hip circumferences, while body mass index (BMI), waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR) were calculated. Statistical analysis revealed the presence of overweight, central obesity risk, underweight, and other health-related anthropometric thresholds among the students. The findings provide an important basis for the early detection of changes in youth, the promotion of a healthy lifestyle, and the development of preventive measures.

Keywords: anthropometry, body mass index (BMI), body height, body weight, chest circumference, waist circumference, hip circumference, waist-to-hip ratio (WHR), waist-to-height ratio (WHtR), physical development, health, students.

Introduction. The high prevalence of overweight, central obesity, and underweight among students highlights the importance of anthropometric indicators as essential criteria for assessing their health and physical development. Measurements such as body height, body weight, body mass index (BMI), waist circumference, waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR) provide valuable insights into students' physical development levels [1,6].

In recent years, factors such as reduced physical activity, unhealthy dietary habits, and increased stress have contributed to a rise in overweight and obesity rates among young people [1,2,5]. According to the World Health Organization (WHO), a BMI below 18.5 kg/m² indicates underweight, a BMI above 25 kg/m² is classified as overweight, and values equal to or exceeding 30 kg/m² correspond to varying degrees of obesity [3,4]. Therefore, examining the anthropometric indicators of students in Karshi city is of particular importance for evaluating their health status. The aim of this study is to analyze students' anthropometric indicators, assess their significance in determining health conditions, and evaluate their compliance with normative standards.

Methodology. The study was conducted during the winter of 2025 among 123 students aged 16–23 years (23 males and 100 females) enrolled at Karshi State University and the University of Economics and Pedagogy. The mean age of participants was 18.5 ± 1.03 years.

Standard anthropometric methods were used to measure body height, body weight, chest circumference, waist circumference, and hip circumference. Based on these measurements, the waist-to-height ratio (WHtR) was calculated from waist circumference and body height, the waist-to-hip ratio (WHR) was derived from waist and hip circumferences, and the body mass index (BMI) was determined using body weight and height. Data were processed and analyzed using Microsoft Excel.

Results and Discussion

- The average height of the students was 167 cm, with an average body weight of 69 kg and a mean BMI of 24.93. (table 1)

- According to BMI classification, 13.7% of students were underweight, 16.94% were overweight, and 1.61% were identified with first-degree obesity. (table 2)
 - Based on waist-to-hip ratio (WHR), 31% of female students and 21.74% of male students were at risk of central obesity.
 - According to waist-to-height ratio (WHtR) ≥ 0.5 , 22% of females and 47.83% of males were found to be at increased risk.
 - Significant differences were observed between the indicators of physical development.
- [1]

Table 1. Descriptive characteristics of the study participants

Anthropometric parameters	Min	Max	Mean	St.Dev
Age	16	23	18,5	1,030974
Height (cm)	145	186	166,5	8,24
Weight (kg)	42	93	69	10,04514
Body Mass Index (BMI)	15,2	30,8	24,93	3,21
Chest circumference	63	110	91	10,69652
Waist circumference	60	118	77,5	10,25787
Hip circumference	71	120	90	8,306888
Waist-to-hip ratio (WHR)	0,677	0,983	0,861	0,087698
Waist-to-height ratio (WHtR)	0,358	0,654	0,465	0,05724

Table 2. Classification of students based on Body Mass Index (BMI)

Category	Body Mass Index (BMI)	Number (N) of respondents (%)
Underweight	Below 18.5	17 (13,7%)
Normal weight	18.5-24.9	84 (67,75%)
Overweight	25.0-29.9	21 (16,94%)
Obesity class 1	30.0-34.9	2 (1,61%)

Conclusion. The results of the conducted study made it possible to assess the health status of university students in Karshi city through the analysis of selected anthropometric indicators.

Based on the obtained values of body mass index (BMI), waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR), tendencies toward overweight and abdominal obesity were observed among the students.

Although the majority of respondents (67.75%) fell within the normal weight category according to BMI, 16.94% were classified as overweight, and 13.7% were found to be underweight. Furthermore, WHR and WHtR analyses revealed the presence of central obesity (31%) and cardiometabolic risk (22%) among female students, while among male students, these figures were 21.74% and 47.83%, respectively.

These findings highlight the relevance of abdominal obesity as a risk factor for health issues among university students. In particular, students with a WHtR ≥ 0.5 require special preventive attention and programs aimed at promoting a healthy lifestyle.

In conclusion, WHR and WHtR can be considered simple, effective, reliable, and modern tools for assessing the health of university-aged populations.

The results of this study emphasize the need for regular monitoring of students' physical development in higher education institutions, promoting healthy eating habits, and developing preventive strategies to increase physical activity.

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