

Anthropometric Survey of 18-20 Years Old Adolescents from Varna

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Deviations from the normal weight are important for identifying metabolic risk. In practice, the categorization of body weight is mostly based on body mass index (BMI). The aim of this study is to obtain updated information on anthropometric status of young people aged 18-20 years from the town of Varna, to compare results with those collected 7 years ago and to match them with the standards for body weight. Deviations from normal BMI at 18-20 years old adolescents are decreased in recent years. This applies both to underweight and overweight. Obesity is a problem typical for a later age, which could be explained by the cumulative effect of years and of accumulated behavioral risk factors.

Key words: anthropometry, BMI.

Introduction

Anthropometry is one of the most accessible and informative methods for assessing growth, nutritional and health status of the individual. Modern health care systems of the past 200 years evaluate in a standardized way growth and nutrition of people with the help of anthropometric measurements [5, 6]. Deviations from the normal weight are important for identifying metabolic risk. Overweight and obesity in adolescence is associated with adverse consequences [4]. Identification of individuals with metabolic risk is done with the help of anthropometric indicators and categorization of weight as normal, overweight or obese [2]. Healthy weight determines the physical shape, greatest capacity, best health and likelihood of longest life [1, 7]. In practice, the categorization of body weight is mostly based on body mass index (BMI).

The aim of this study is to obtain updated information on anthropometric status of young people aged 18-20 years from the town of Varna, to compare results with those collected 7 years ago and to match them with the standards for body weight.

Materials and Methods

In 2013 the height and weight of 184 young people from the district of Varna were measured. Growth is measured with a precision of 1 mm using a portable stadiometer (Seca Ltd., Hamburg, Germany) in a standardized way according the procedure

of WHO. Weight was determined to the nearest 0.1 kg using a calibrated electronic scale (TANITA BC-420) in light clothing of the participants. BMI was calculated using the standard formula, introduced more than 100 years and continuously used to assess body mass and the degree of malnutrition and obesity: $BMI = \text{weight (kg)}/\text{height (m}^2\text{)}$. Underweight, overweight or obesity were determined by applying the WHO criteria for BMI in a population aged over 18 years:

- Normal weight: 18.5 to 24.99 kg/m²;
- Overweight: 25-29.9 kg/m²;
- Obesity: over 30 kg/m²;
- Risk of malnutrition: under 18.5 kg/m².

Surveyed adolescents represented 12% of the 12th grade pupils attending state schools in the region of Varna, according to the Regional Education Inspectorate, which makes the sample representative of the region. The study included only healthy subjects aged 18-19 years without chronic conditions limiting physical activity and capacity, and without physical abnormalities. The values were included in worksheets and analyzed.

Data was compared with results based on a similar survey conducted in 2006 among 179 young people from the same age group in Varna. The results were analyzed statistically.

Data was referred to the current WHO criteria for BMI in the population aged over 18 years, differentiated by age and sex based on international reference population [3].

Results

The analysis of the two cohorts found that one in ten young people are with underweight body weight (**Table 1**). Data from 2006 show that 12.29% of the young people have a BMI below 18.5 against 10.87% in 2013 (**Fig. 1**). The incidence of malnutrition in this age group decreased by nearly 20% over seven years.

Table 1. Representation of body weight results

Categories of body weight –WHO 1995	BMI	2013		2006	
	limit	number	%	number	%
Underweight	<18.5	20	10.87	22	12.29
Normal weight	18.5-24.99	123	66.85	110	61.45
Overweight	24.5-29.99	31	16.85%	34	18.99
Obesity I degree	30-34.99	9	4.89	7	3.91
Obesity II degree	35-39.99	1	0.54	3	1.68
Obesity III degree	40 +			3	1.68

With normal body weight were approximately 2/3 of males in both studies. This difference in the two cohorts was insignificant (61.45%-66.85%).

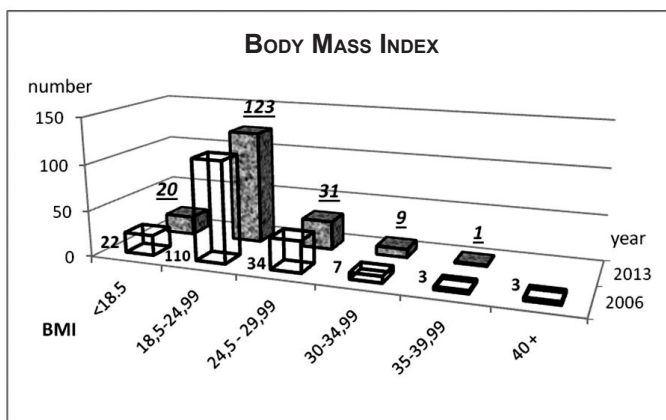


Fig. 1. Graphical representation of the body mass index results

The results for the categories overweight and obesity are intriguing. In 2006, 18.99% of the Varna adolescents were overweight compared to 16.85% of those measured in 2013 with a marked difference of 11.27% in a trend of reducing overweight. Similar is the data on obesity prevalence. The overall percentage of obese adolescents is similar in our two measurements (5.43% in 2013 against 6.27% in 2006). In the last (2013) measurement 9/10 of the adolescents with a BMI over 30 are with the lightest, first degree obesity. In the study from 2006 the distribution of light / medium / severe obesity is 2/1/1. Our results are similar to those found by the National survey of dietary intake and nutritional status of pupils in Bulgaria, conducted under the guidance of prof. Petrova and published in 2003: 19.2% of 18-19-year-olds have a BMI over 25, and 2.1% are with a BMI over 30 [3, 8].

Analysis and Conclusion

The reported results lead to the following conclusions:

1. Deviations from normal BMI at 18-20 years old adolescents are decreased in recent years. This applies both to underweight and overweight.
2. Subjects with severe obesity, referred to as “morbid obesity” are almost absent in the later study of 2013.

We can consider the conclusion that growth of individuals with overweight in recent decades should be carefully considered by the positioning of the various criteria. It should always be taken into account cultural influences and impact of public awareness of the topic “overweight”. The truth is that this topic is repeatedly attracting attention and discussed in public.

Although the data of many authors about the increase of the prevalence of overweight among young people, our study found a trend to reduction of overweight in the population in the study. Obesity is a problem typical for a later age, which could be explained by the cumulative effect of years and of accumulated behavioral risk factors.

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