

## STUDY OF BODY MASS INDEX WITH TEENAGERS FROM MARAMURES COUNTRY

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### Abstract

*The objective of this study was to assess the prevalence of overweight, obesity and underweight among school children of Maramures Educational District. A total of 180 teenagers aged 13 and 14 were screened from rural and urban schools. 90 boy subjects and 90 girl subjects have been studied. Clinical height and weight were used to calculate body mass index. Body mass index (BMI) is important for estimating the nutrition conditions of the teenagers population studied. The results indicated that in rural area the underweight rate in subjects, age 13, were higher compared to overweight and obesity respectively. There is descending trend in the prevalence of underweight in subject age 14. At the 13 years more girls than boys are overweight. The prevalence of overweight among subject study, age 14, decreased. The percentage of children who suffer from obesity and are overweight is different between the studied groups and also between sexes.*

Keywords: teenagers, body mass index, urban area, rural area

### 1. INTRODUCTION

Pre-puberty begins with both genders around the age of 10 – 11 and lasts, with girls, about 2 years, up to 12 – 13, and in case of boys it lasts four years, up to 14 – 15 years. In the puberty period, the somatic development is influenced by internal and external factors which bring about quantitative and qualitative changes.

Studying the main anthropometric variables on an homogenous batch of teenagers allows the observation of the growth and the development of the organism as well as the appreciation concerning the nutrition condition of the teenager population studied [4].

Body mass index (BMI) is important for estimating the nutrition conditions of the teenagers population studied. BMI can be considered an alternative for direct measures of body fat.

In addition, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems. In conclusion, BMI is used to screen for overweight and obesity the children [1, 2].

### 2. MATERIALS AND METHODS

The study has been carried out on a batch of 180 teenagers, aged 13 – 14 divided into rural

and urban areas, having each 90 subjects. Subjects from urban area were made up of teenagers living in towns Baia Mare and Baia Sprie, and subject from rural area are from Lăpuș zone. 90 male subjects and 90 female subjects have been studied.

The recommended procedures for the anthropometric measurements are the subjects in orthostatic posture wearing light clothes. The measurements have been carried out on healthy subjects. The variables studied were: height (Iv-sol) with the stadiometer and the weight, with a calibrated balance.

BMI is calculated by dividing weight (in kilograms) to squared height (in meters). The BMI-weight status variable defines BMI values of less than 18.5 kg/m<sup>2</sup> as underweight, 18.6-24.99 kg/m<sup>2</sup> as normal, 25 kg/m<sup>2</sup> or above as 29.9 kg/m<sup>2</sup> overweight and up to 30 kg/m<sup>2</sup> obese [5].

### 3. RESULTS

Figure 1 shows the body mass index values for the subjects, age 13.

The average body mass index among girls, years 13, was 20.59 kg/m<sup>2</sup> and boys 19.29 kg/m<sup>2</sup> from urban area and teenagers from rural area was 18.2 kg/m<sup>2</sup> (girls) and 18.22 kg/m<sup>2</sup> (boys). The BMI average is higher for subjects

from the urban area because the anthropometric indexes are also higher.

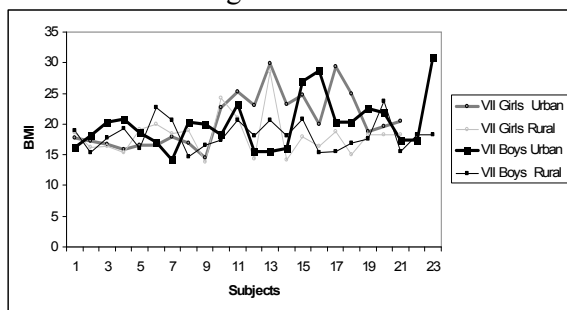


Figure 1. Body mass index values for the subjects, age 13.

In Table 1 the body mass indexes are grouped into 4 categories: underweight, normal, overweight and obesity.

Table 1. Frequency distribution of BMI values of 13 years teenagers

BMI	Under-weight	Normal	Over-weight	Obe-sity
Girls				
Urban area	45.57%	35%	20%	-
Rural area	55.57%	38.88%	5.55%	-
Boys				
Urban area	43.47%	43.47%	8.69%	4.34%
Rural area	65%	35%	-	-

The BMI of the girls subjects, age 13, from the urban area, showed that 45% of the subjects were underweight, 35% were normal and 20% overweight compared with the rural area where 55.57% of the subjects were underweight, 38.88% normal and 5.55% overweight.

For boys, age 13, 43.47% were classified as underweight, 43.47% normal, 8.69% overweight and 4.34% obese compared with the rural group where 65% were underweight and 35% normal. BMI is only one of the many factors used to predict the risk for the disease.

Figure 2 presents the body mass index values for the subjects, age 14.

As seen in Table 2 the BMI of the 14 years old girl subjects, from urban area, shows that 15% of the subjects were underweight, 75% were normal and 10% overweight compared with rural area where 12.5% were underweight and 87.5% normal.

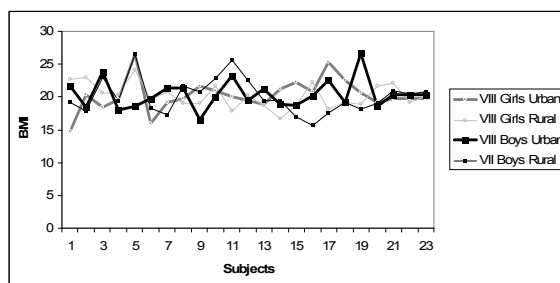


Figure 2. Body mass index values for the subjects, age 14.

Table 2. Frequency distribution of BMI values of 14 years teenagers

BMI	Under-weight	Normal	Over-weight	Obesity
Girls				
Urban area	15%	75%	10%	-
Rural area	12,5%	87,5%	-	-
Boys				
Urban area	10%	85%	5%	-
Rural area	22,22%	77,78%	-	-

From the 14 year old boy subjects in the rural group 10% were classified as underweight, 87.5% normal and 5% overweight. The rural group indicates 22.22% underweight and 77.78% normal weight.

The average body mass index among girls, years 14, was 20.37 kg/m<sup>2</sup> and boys 20.3 kg/m<sup>2</sup> from urban area and teenagers from rural area was 20.3 kg/m<sup>2</sup> (girls) and 20.2 kg/m<sup>2</sup> (boys).

### 3. DISCUSSIONS

The somatic indexes (height and weight) increase at puberty. In the last decade one has noticed a phenomenon of acceleration of the specific growth of the young people, both in urban and in the rural areas.

Weight is a very labile index, which depends less on genetic factors and more on the influences of the external (nutrition) and internal (metabolism) environment.

The height is considered one of the main indexes of the somatic growth. The height is more influenced by heredity and less by environmental factors. That is why it represents a more stable index, which varies within narrower limits (it decreases only very rarely).

The results indicated that in rural area the underweight rate in subjects, age 13, were

higher compared to overweight and obesity respectively. The underweight is more common in boys, at years 13. Underweight at this age will retard the growth and the development of various systems.

This may be due to deficient nutritional supply needed by the growth at this age. There is descending trend in the prevalence of underweight in subject age 14.

When the body mass index is higher than 25 kg/m<sup>2</sup> then health problems such as high blood pressure, heart disease, diabetes and certain cancers are more likely to occur [9]. The main causes of children becoming overweight are the lack of physical activity unhealthy eating habits, genetic reasons or a combination of these three [3, 6, 7]

At the 13 years more girls than boys are overweight. The percentage of children who suffer from obesity and overweight is different between the studied groups and also between sexes [8].

The prevalence of overweight among subject study, age 14, decreased [7]. It is also interesting to note that among rural girls and boys it lacks completely.

Obesity is developed when the energy intake exceeds the energy used for physical activity. People whose BMI is up to 30 kg/m<sup>2</sup> suffer from obesity.

The greater concern is that the risks of overweight during adolescence will be persisting to adulthood. Tackling the problems of the growing numbers of overweight individuals is a major challenge for most countries.

Monitoring of overweight prevalence in adolescents and taking timely preventive measures will be an effective approach in dealing with the problem of obesity.

#### 4. CONCLUSION

Thus, in the present study, the prevalence of overweight and obesity was found to be higher in urban boys and girls compared to rural boys and girls. The prevalence of overweight among girls was found to be higher than boys.

The percentage of children who suffer from obesity and are overweight is different between the studied groups and also between sexes.

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