

## TRENDS IN PHYSICAL DEVELOPMENT AND BODY MASS COMPONENTS ACCORDING TO THE PHYSICAL ACTIVITY UNDERTAKEN

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### INTRODUCTION

Our study, conducted in 2014, was aimed at comparing the values of some parameters that highlight physical development and body mass components of two groups, one constantly undertaking physical activity and one with low physical activity. The sample studied consisted of 134 individuals (95 girls and 39 boys), with ages between 19 and 45. Because during our investigation it was revealed that of the 134 individuals, the highest percentage was that of subjects aged 20 (63 individuals, 47.01%), the analysis on body mass components and physical development was performed only for this age group.

### MATERIAL AND METHODS

The subjects involved in the study were weighed and measured to determine body composition, after having previously given their written consent to participate in our study. As working tools, there were used the body ruler to determine body stature (size or height), and scales with BIA (bioelectrical impedance analysis), to define the following parameters: weight, BMI, fat mass, visceral fat mass, muscle mass, bone mass, total body water. The studied sample (134 individuals) were divided into two groups: group 1 – the group of individuals constantly performing physical activity -

87 individuals; group 2 – the group of individuals with low physical activity - 47 individuals. The data obtained from the measurements was subjected to interpretation only for those belonging to the age group of 20.

### RESULTS AND DISCUSSIONS

In the sample aged 20 years old, group 1 (students with physical activity performed constantly) consists of 77.07% girls and 22.92% boys, and group 2 (low physical activity) comprises 86.67% girls and 13.33% boys. It appears that within the age group of 20 years, in both groups, girls have the highest percentage.

#### EVALUATION OF BODY HEIGHT

The measurements carried out on body height were grouped into tall, middle and short stature, the findings being that in group 1 83.78% of the total number of girls and 63.64% of the total number of boys have middle stature, and in group 2 (low physical activity) 84.62% of the total number of girls and 50.00% of the total number of boys have middle stature.

By comparing the data, it may be seen that the share of medium stature recorded the highest values in both groups, for both girls (group 1 - 83.78%, group 2 - 84.62%) and boys (group 1 - 63.64%, group 2 - 50.00%), (fig. 3).

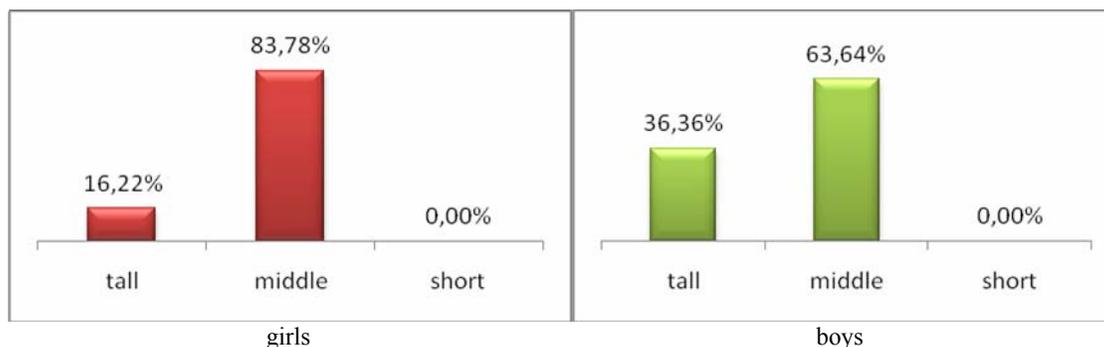


Fig. 1. Comparative data on the stature of girls and boys in group 1  
(physical activity performed constantly)

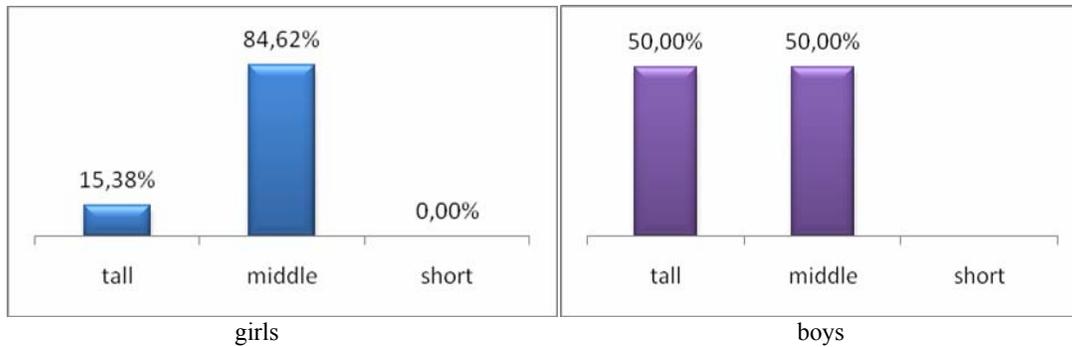


Fig. 2. Comparative data on the stature of girls and boys in group 2 (low physical activity)

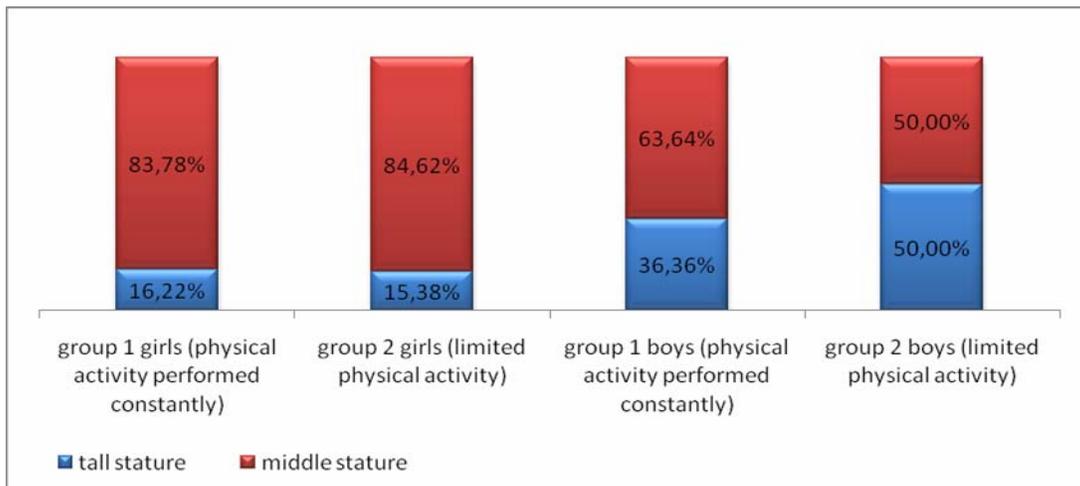


Fig. 3. Comparative data on the stature of girls and boys in the two groups

### ASSESSMENT OF BMI

According to the WHO, the body mass index (BMI) is a standard in assessing the risks related to overweight.

Determination of weight and body mass index enables us to frame the subject within limits of normality or deviation.

Analysing the values of the BMI shows that the share of normality records high values for both groups studied.

In group 1, the normal state is present at 89.19% (fig. 4) of the total number of girls, and at 100% (fig. 4) of boys.

There were also cases of deviation from normality. Of the total number of girls in group 1, there were 2 overweight cases, 1 case of obesity and 1 underweight case.

In group 2 normality is present at 92.31% (fig. 5) of the total number of girls, with one case of second-degree obesity. Out of the total of boys, 50.00% are underweight and 50.00% are overweight.

Following a comparative analysis of the recorded values of BMI, it was found that for the girls in group 1, who undertake physical activity constantly, there were cases of deviation from the normality of 10.81%, whereas for the girls in group 2 the deviation was only 7.69%.

According to BMI values there can be determined the risk of disease: increased, lowest, high, very high, extremely high. The classification of health risks related to BMI was performed in accordance with Health Canada – Canadian Guidelines for Body Weight Classification in Adults, 2003.

For group 1, the highest percentage is represented by the lowest risk, both for girls (89.19%) and boys (100%). Yet, we see that 8.11% of girls show increased risk of disease, and 2.70% a high risk, (fig. 6).

In group 2, girls showed the lowest risk of disease (92.31%) compared to boys who have an increased risk of disease of 100%, (fig. 7).

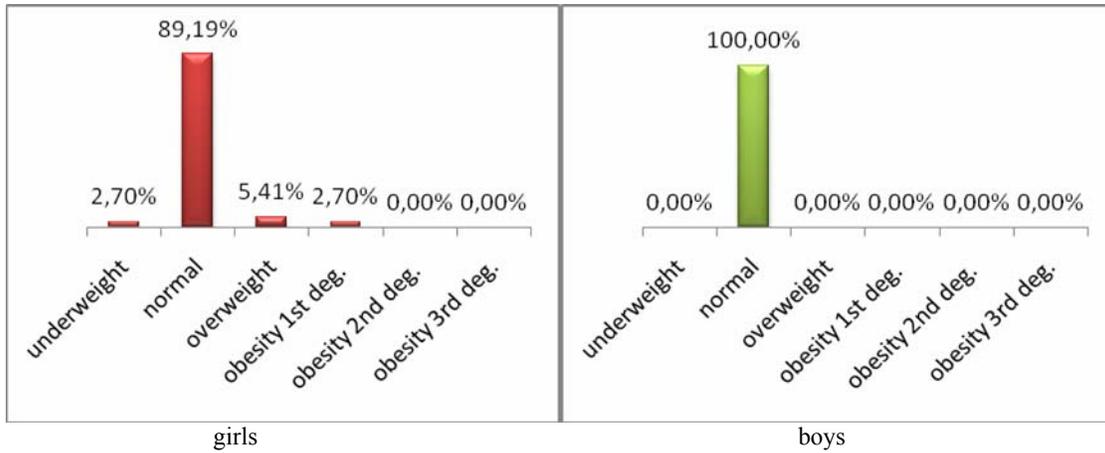


Fig. 4. The percentage of normality or deviation values according to BMI values recorded for group 1 (physical activity performed constantly)

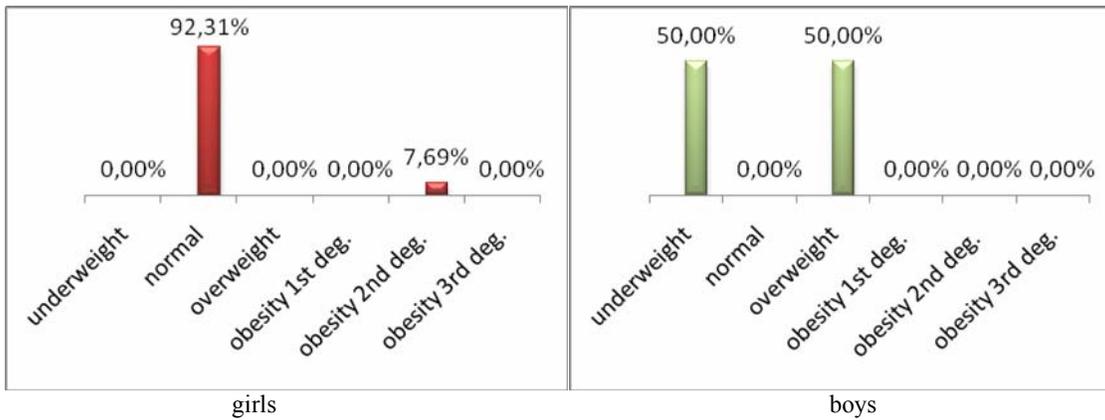


Fig. 5. The percentage of normality or deviation values according to BMI values recorded for group 2 (low physical activity)

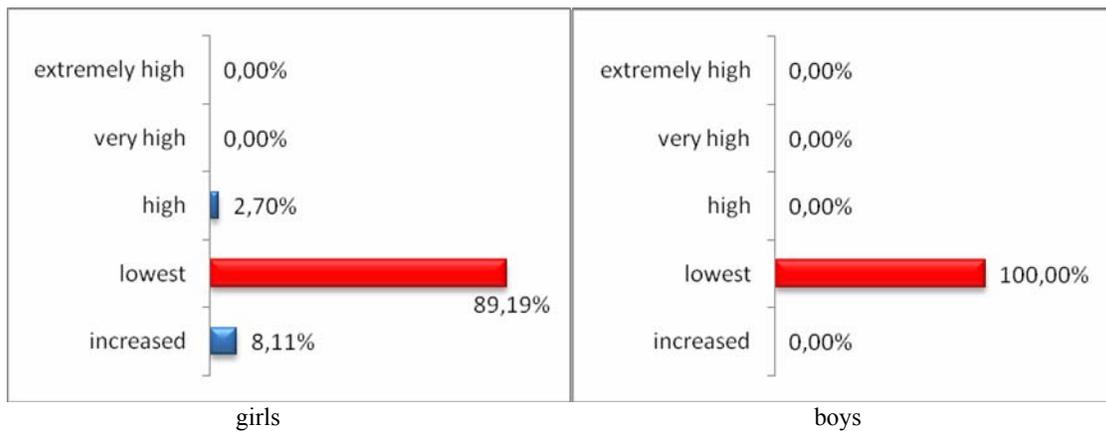


Fig. 6. The risk of disease in relation to BMI for group 1 (physical activity performed constantly)

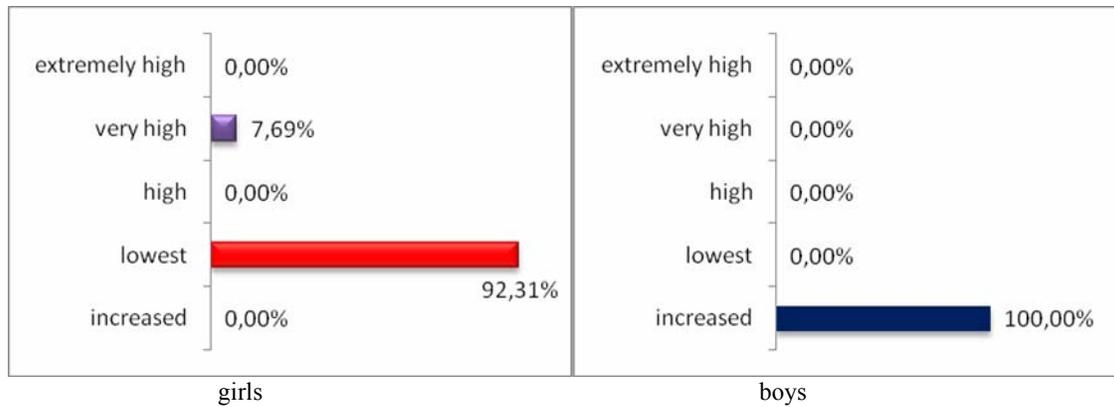


Fig. 7. The risk of disease in relation to BMI for group 2 (low physical activity)

### ASSESSMENT OF BODY COMPOSITION

#### Fat mass

A comparison of the values recorded for fat body mass reveals the fact that although the individuals in group 1 perform physical activity constantly (fig. 8) they have normal levels in percentages, similar to those in group 2 (low physical activity), (fig. 9).

#### Visceral fat mass

The values recorded for visceral fat mass fell between the parameters for the two groups, with values ranging from 1% to 6%, the value of 1% holding the largest share (group 1 - 77.08%, group 2 - 66.67%), (fig. 10).

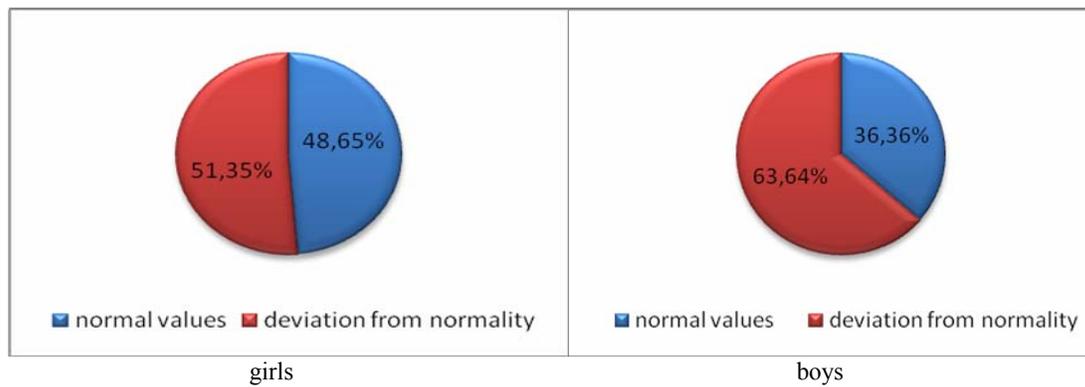


Fig. 8. The state of normality and deviation regarding the percentage of fat in the body mass - group 1 (physical activity performed constantly)

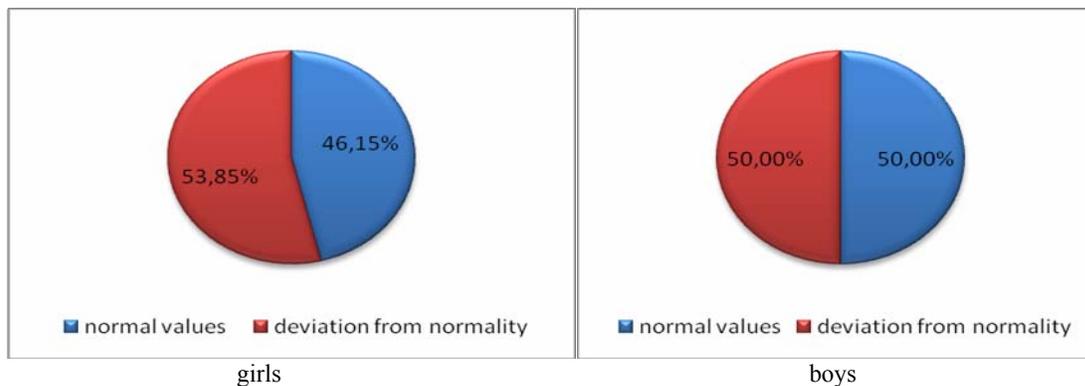


Fig. 9. The state of normality and deviation regarding the percentage of fat in the body mass - group 2 (low physical activity)

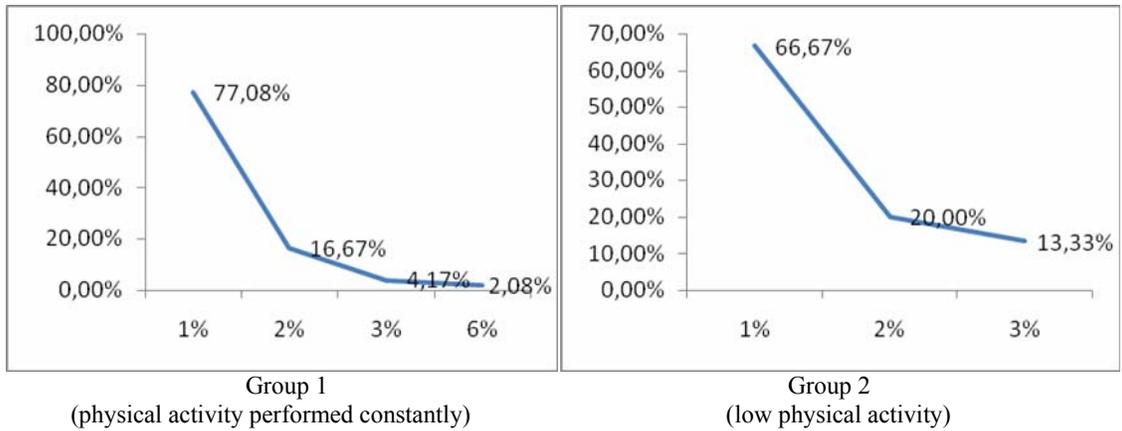


Fig. 10. The percentage of visceral fat mass in the body mass

#### ASSESSMENT OF FAT-FREE MASS

The values recorded for the parameters characteristic of fat-free body mass correspond to a state of normality, the higher values for the individuals in group 1 highlighting the fact that they constantly perform physical activity.

##### Muscle mass

At the level of the individuals belonging to group 1, the mean value of muscle mass is 46.01%, with the minimum limit of 35.2% and the maximum of 69.8%. Regarding the individuals in group 2, the average value of muscle mass is 44.56%, with the minimum of 37.8% and the maximum of 59.1%.

##### Bone mass

For bone mass, the average value for individuals in group 1 is 2.45%, with the minimum of 1.9% and the maximum of 3.6%, and the average value for group 2 is 2.38%, with the lower limit of 2.0% and 3.1% for the higher limit.

##### Total body water

At the level of individuals belonging to group 1 the average amount of water in the body is 57.90%, with the minimum of 43.8% and a maximum of 70.4%. At the level of individuals in group 2 the average amount of water in the body is 55.71%, with the minimum of 40.5% and a maximum of 66.0%, (fig. 11).

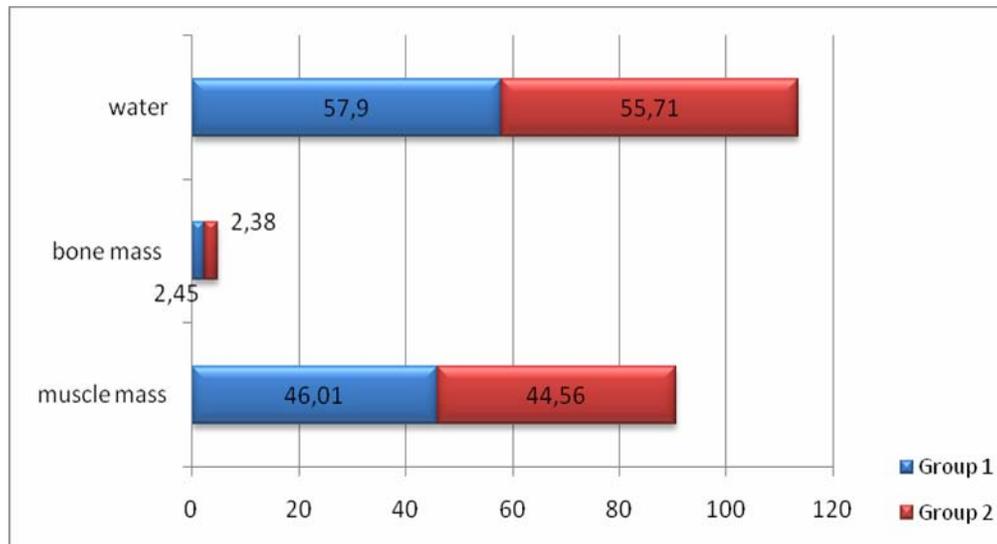


Fig. 11. The percentage of the parameters that characterize the fat-free mass of the body composition for the investigated individuals (Group 1- physical activity performed constantly and Group 2 - reduced physical activity)

## CONCLUSIONS

The investigated sample was divided into two groups: group 1 –the group of individuals performing physical activity constantly - 87 individuals; group 2 –the group of individuals with low physical activity - 47 individuals. The studied sample consisted of 134 students (95 - girls and 39 - boys), aged between 19 and 45. The analysis of the components of body mass and physical development was performed for the age group of 20 years.

Body height –the subjects in group 1 havemiddle stature, 83.78% of the total number of girls and 63.64% of the total number of boys, and the subjects in group 2 havemiddle stature, 84.62% of the total number of girls and 50.00% of the total number of boys.

The BMI values show that the percentage of the state of normality recorded high values in both groups studied.

The parameters recorded for fat body mass indicates that most of the individuals have normal values.

The values recorded for visceral fat mass are normal for the two groups, with values ranging from 1% to 6%, the 1% value holding the largest share (group 1 - 77.08%, group 2 - 66.67%). The recorded values for the parameters characteristic of non-fat body mass are in a state of normality for both groups of subjects.

The identified parameters highlight the influence of physical activity on the body mass composition and physical development.

## ABSTRACT

Our study on physical development and body mass components was conducted in 2014, on two groups of individuals (group 1 - constant physical activity, group 2 - low physical activity). Middle stature occupies the largest share in both groups. Although normality, identified by BMI values, recorded high values for both groups, there were nevertheless also identified cases of deviation from normality. The influence of physical activity on the body mass composition was highlighted by the values recorded by the parameters of body composition (fat mass, visceral fat mass, muscle mass, bone mass, total body water).

## REFERENCES

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