

ANALYSIS OF DIFFERENCES BETWEEN BOYS AND GIRLS IN THE SIXTH GRADE OF PRIMARY SCHOOL IN THE DEGREE OF NUTRITION AND BODY COMPOSITION

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ABSTRACT: The research was conducted on a sample of 94 6th grade students, of which 44 were boys and 50 girls. The aim of the research was to determine the degree and differences in the degree of nutrition and body composition between boys and girls of the 6th grade of primary school. Based on the obtained results, t-test for small independent samples, it was determined that there are statistically significant differences between boys and girls of the 6th grade of primary school in the degree of nutrition. Certain variations were observed in body composition, estimated by 34 variables using the InBody 720 bioelectric impedance, but they were not statistically significant. Looking at 6th grade male and female respondents separately, it can be noticed that overweight is more prevalent in the 6th grade boys than girls, and obesity is equally prevalent in both sexes. Of the total number of male respondents in the 6th grade, 44, 17 (38.6%) are overweight, and 9 (20.5%) are obese, while 18 (40.9%) boys in the 6th grade are of normal body weight, and there were no malnourished students in this group. Of the total number of female respondents in the 6th grade, 50, 10 (20.0%) are overweight, and 9 (18.0%) are obese, while 30 (60.0%) girls in the 6th grade have a normal body weight, and 1 (2.0%) 6th grade student belongs to the category of malnourished. The obtained data indicate a big problem of today, which is conditioned by bad habits and lifestyle. Today, students are increasingly exposed to the negative influences of the environment. Television, cell phone, computer and games lead to spending too much time indoors, sitting. That is why the greatest influence on shaping the personality and adopting eating habits, have the parents, but also the school and the society. Elementary school students buy their own food, choose what tastes best to them, even though it may not be healthy. It is necessary to act preventively on time through more frequent monitoring and analysis of proper growth and development and motivating students to get involved in sports actively or recreationally. Proper habits that are adopted in childhood, in most cases, remain at other stages of development.

Keywords: *body mass index, sixth grade students, body composition, degree of nutrition, gender.*

INTRODUCION

Monitoring the nutritional status is a very useful activity because it indicates the adequacy of the process of growth and development of children, helps to understand the current, and can also serve as a prognostic factor for their future health. The nutritional status of children can be assessed on the basis of clinical examination, laboratory procedures and anthropometric measurements. Height and body weight are most often used to determine nutrition (Caccaiari et al., 2002; Vlaškalić and Vlaški 2005). Adolescents (10 - 19 years of age) belong to the category of vulnerable categories of the population with regard to intensive growth and development (WHO, 2005). Hunter states that physical activity is the factor that prevents the appearance of excess weight. Research shows that there is an increasing number of children suffering from type 2 diabetes precisely because of obesity (Hunter et al., 2000). If we look at the American continent we will see that in the last 10 years the number of obese has increased by 50%, and two-thirds of Americans are overweight or obese. The situation with children is also worrying and from the data we can see that 4 million children aged 6 to 11 and more than 5 million children aged 12 to 19 are obese (Westcott, 2006). Anthropometry is used to determine the degree of nutrition. Anthropometric methods are the most important procedures in assessing the nutritional status of children, they involve measuring different body

dimensions using recommended aids and standardized techniques. The most important and most frequently used anthropometric quantities are: body height - length, body weight, thickness of subcutaneous adipose tissue above the triceps or scapular angulus, upper arm circumference, waist circumference, etc. (Krebs et al., 2007). Children and adolescents who are at risk of being overweight often also become obese adults. Nutritional status is an indicator of physical fitness and health status of an individual and the entire population (Rakić et al., 2008). The average amount of body fat at birth is about 13.0% of body weight, and at the end of the first year about 28.0%. In the following years, the amount of fat decreases, and a re-increase occurs around the age of 12 in girls and 16-17. years in boys. Gender differences in the amount of fat in the body appear in early childhood. Girls show a higher percentage of adipose tissue than boys as young as 5 to 6 years of age. In boys, a significant decrease in the relative fat content between 12-13 and 16-17 year is most often observed, ie. in the period of sexual maturation. During this period, boys experience a large increase in lean body mass and a consequent decrease in the relative share of fat in total body weight. At the end of adolescence, the difference in the percentage of fat between the sexes is about 10.0%. From the onset of adulthood until the age of 60, the percentage of body fat increases by about 1.0% per decade, while after the age of 60

the relative share of fat in total body weight decreases slightly primarily due to a decrease in adipose tissue (WHO, 1995). Adipose tissue redistributes with age and increasingly accumulates in the abdominal area (visceral fat) (Seidell & Visscher, 2000). During the aging process, there is an increase in visceral fat, while subcutaneous fat in other parts of the body decreases due to the redistribution of fat in the body (Zamboni et al., 2005). Therefore, the diagnosis of the state of body composition is often the subject of research based on which a realistic insight into the current state of the defined population and possible negative or positive trends of growth and development over a period of time (Dopsaj et al., 2005). The influence of diet and physical activity changes the relationship between fat and non-fat mass, and thus the composition of the body. Most methods of determining body composition are based on a two-component model (non-fat and fat mass), while some methods are based on a three-component (water, non-fat and fat mass) and four-component (water, bone minerals, proteins and fat) model (Mišigoj-Duraković, 2008). The aging process affects the increase in adipose tissue and decrease muscle mass, which in general leads to changes in body composition and shape (Krznačić et al., 2011). Due to its simplicity and accuracy, the body mass index (BMI) is widely used in assessing nutritional status. Although it does not provide information on body composition, in combination with other methods that determine body composition, information on the degree of nutrition of an individual or an observed group can be obtained (Mišigoj-Duraković et al., 2014). The most significant disorder is obesity which is more and more prevalent in children in adolescence. Ten years ago, statistical data showed that 10.5% of children in Croatia have increased body weight, and 3.8% of them are obese. The latest data from the Croatian Institute of Public Health (Croatian Institute for Public Health) say that 26.4% of school-age children are overweight, while 11.2% are obese. Croatia is in a worrying fifth place in Europe in terms of the number of overweight children (Kolarić & Nožinić, 2016). A large survey conducted in Greece in 2011 at the age of 11-12 shows that 36.6% of children are overweight and obese (Šimestin Pavić, 2016). According to the World Health Organization (WHO, 2018), childhood obesity is one of the greatest global public health challenges of the 21st century. It is estimated that in the last 40 years, the number of obese school-age children and adolescents has increased as much as tenfold. Baranowski & Taveras (2018) point out that the current approach to the issue of childhood obesity has not yielded the expected results and that it is necessary to strengthen preventive activities at all levels, starting with parents. Nutrition and school are related for several reasons and thus affect the analysis of nutritional status and body composition of primary school age students. Own choice and consumption of food, nutrition is no longer completely under the control of parents, unsupervised eat at least one meal a day or even

several snacks, modern, fast lifestyle also affects diet, lack of time, life dynamics and increasing employment of parents affect that children and young people more often consume food outside the home, more often they eat meals that are rich in energy in terms of nutritional composition, but do not contain a sufficient amount of nutrients and protective substances - vitamins and minerals (Tajlić, 2019). In the research conducted on the ITOF criterion, the majority of children, 165 or 65.74% of them were normally fed, as many as 21.51% were malnourished, while children with increased body weight were 7.97% and 4.78% obese (Paić, 2019).

MATERIAL AND METHODS

Participants

The study included a sample of 94 students divided into two subsamples: 44 boys and 50 girls. Mean values for boys Body Height (BH) 151.93 ± 7.28 cm, Body Weight (BW) 46.28 ± 10.06 and Body Mass Index (BMI) 19.88 ± 3.26 kg / m². Average values for girls Body Height (BH) 154.07 ± 7.91 cm, Body Weight (BW) 46.70 ± 11.62 kg and Body Mass Index (BMI) 19.43 ± 3.49 kg / m².

The sample of variables

The sample of measuring instruments used in the research represents a set of 34 variables. To assess the anthropometric characteristics, 3 variables were taken: Body Height (BH), Body Weight (BW) and Body Mass Index (BMI). All anthropometric variables were measured according to standard procedures of the International Society for the Advancement of Kinanthropometry (ISAK) (Marfell-Jones, et al., 2006). The following variables were used to assess body composition:

- 10 variables for assessing body composition: Total Body Water (TBW), Proteins, Minerals, Body Fat Mass (BFM), Soft Lean Mass (SLM), Fat / non-fat tissue ratio (Ratio BFM / SLM), Fat Free Mass (FFM), Skeletal Muscle Mass (SMM), Minerals in the Bones (MB), Percent Body Fat (PBF).
- 10 variables for segmental display of body muscle mass: right arm muscle mass (FFM of Right Arm), right arm muscle mass percentage (% FFM of Right Arm), left arm muscle mass (FFM of Left Arm), left arm muscle mass percentage (% FFM of Left Arm), muscle mass trunk (FFM of Trunk), percentage of torso muscle mass (% FFM of Trunk), right leg muscle mass (FFM of Right Leg), right leg muscle mass percentage (% FFM of Right Leg), left leg muscle mass (FFM of Left Leg), left leg muscle mass percentage (% FFM of Left Leg).
- 10 variables for segmental display of adipose tissue: right arm adipose tissue (BFM of Right Arm), right arm adipose tissue percentage (% BFM of Right Arm), left arm adipose tissue (BFM of Left Arm), left arm adipose tissue percentage (% BFM of Left Arm), adipose tissue trunk (BFM of Trunk), body fat percentage (% BFM of Trunk), right leg fat (BFM of Right Leg), right leg fat (% BFM of Right Leg), left leg fat (BFM of Left Leg), the percentage of adipose tissue of the left leg (% BFM of Left Leg) and
- a variable to assess the waist-to-hip ratio (WHR)

Waist-Hip Ratio).
 • Body composition was measured with an InBody720 Scale (Aandstad, Holtberget, Hageberg, Holme, & Anderssen, 2014).

Research Desing

Anthropometric variables were measured according to standard procedures of the International Society for the Advancement of Kinanthropometry (ISAK) (Marfell-Jones et al. 2006). Based on the variables BH and BW, BMI [$BMI = BH \text{ (kg)} / BW \text{ (cm)}^2$] was calculated. BMI values for both subsamples were classified into 4 nutritional levels, according to the recommendations of the Centers for Disease Control and Prevention, 2000 (Kuczmarski et al., 2000) Table 1.

Table 1. Categorization of nutrition based on percentiles

BMI ≥	95th percentile	Obesity
BMI =	85-95th percentile	Tendency towards obesity
BMI =	5-85th percentile	Normal nutrition
BMI ≤	5th percentile	Malnutrition

Centers for Disease Control and Prevention, 2000 (Kuczmarski et al., 2002).

Body composition was measured with an InBody720 scale (Aandstad, et al., 2014). The validity of determining the body composition with InBody720 scales on a sample of children has been positively

evaluated in some previous studies (Lim et al., 2009; Tompuri et al., 2015). The research was approved by the Ethics Commission of the Faculty of Education, University of Sarajevo (World Medical Association, 2013). All parents are informed in advance about the implementation of the research which explains the purpose and goal of the research. Therefore, the research was supported by all parents, with written consent.

Statistical Analysis

All data collected by the research were processed by descriptive and comparative statistics. From the space of descriptive statistics, the arithmetic means, and standard deviation were calculated for each variable, while the T-test for small independent samples was used to determine the differences. The statistical program for personal computers SPSS for Windows-version 20.0 was used for data processing.

RESULTS

Table 2 presents the results of the basic parameters of descriptive statistics, minimum value (Min.), Maximum value (Max.), Arithmetic mean (M) and standard deviation (SD) for body height, body weight and body mass index (BMI), of boys and girls in the 6th grade. The average height for 6th grade boys is 151.9318 cm and the weight is 46.2886 kg, while the average value for BMI is 19.8818. The average height value for 6th grade girls is 154.0700 cm and the weight is 46.7000 kg, while the average value for BMI is 19.432.

Table 2. Descriptive statistics related to body height, weight of subjects and BMI, and by sex

6 th grade boys	N	Xmin.	Xmaks.	M	SD
Body height	44	137.00	169.90	151.9318	7.28614
Weight	44	29.50	73.00	46.2886	10.06022
BMI	44	14.90	28.10	19.8818	3.26990
6 th grade girls	N	Xmin.	Xmaks.	M	SD
Body height	50	129.30	173.60	154.0700	7.91571
Weight	50	22.80	77.70	46.7000	11.62288
BMI	50	13.80	27.60	19.4320	3.49229

Table 3. shows the percentile values for the BMI variable, based on which it is possible to see the nutritional status of 6th grade students by gender. A very high percentage of overfed and obese students is obvious, given that this is a small sample of respondents. Looking at all respondents, out of the total number of respondents 94 (100%), 45 of them (47.8%) are overweight or obese. Looking at 6th grade boys and girls separately, it can be observed

that overweight and obesity are more prevalent in boys than in girls. Out of a total of 44 boys, 9 (20.5%) are obese, 17 (38.6%) are overweight, while 18 (40.9%) boys are of normal weight and there were no malnourished people. Out of a total of 50 girls, 9 of them (18.0%) are obese, 10 (20.0%) are overweight, while 30 (60%) girls are of normal body weight, and 1 girl (2.0%) belongs to the category of malnourished.

Table 3. Frequencies and percentage values of body mass index by categories for 6th grade respondents, and by sex

Nutritional status	Boys			Girls		
	N	Percentiles	%	N	Percentiles	%
Obesity	9	≥95	20,5	9	≥95	18,0
Overeating	17	85-95	38,6	10	85-95	20,0
Normal nutrition	18	5-85	40,9	30	5-85	60,0
Malnutrition	0	<5	0,0	1	<5	2,0
Total:	44		100,0	50		100,0

Analyzing the results shown in Table 4, we can notice that there are certain variations between boys

and girls in body composition parameters, but no t-test is statistically significant, and it can be concluded that there are no statistically significant differences between boys and girls.

Table 4. Value and level of significance of t-test in examining differences between boys and girls of 6th grade in values of parameters related to general body composition

Variable	Difference	St. error	t-test	p	95% confidence interval	
					Lower limit	Upper limit
TBW	-0.382	0.893	-0.428	0.670	-2.156	1.392
Proteins	-0.068	0.240	-0.283	0.778	-0.545	0.409
Minerals	-0.062	0.091	-0.677	0.500	-0.243	0.119
BFM	0.103	1.360	0.075	0.940	-2.598	2.803
SLM	-0.453	1.149	-0.394	0.694	-2.736	1.829
Ratio BFM/SLM	0.012	0.036	0.337	0.737	-0.059	0.083
FFM	-0.314	1.226	-0.256	0.798	-2.748	2.120
SMM	-0.219	0.727	-0.300	0.765	-1.663	1.226
MB	-0.080	0.077	-1.031	0.305	-0.233	0.074
BMI	0.446	0.709	0.629	0.531	-0.963	1.855
PBF	0.519	1.797	0.289	0.774	-3.051	4.088

p- significance level

Analyzing the results shown in Table 5, it is noticeable that no statistically significant difference was found between boys and girls when it comes to muscle mass values (no t-test is statistically significant), but significant differences were found

when it comes to the percentage of muscle mass on all examined body parts. On average, girls have a significantly higher percentage of muscle mass in the left and right arms, torso, and left and right legs.

Table 5. Differences in the representation of muscle mass between 6th grade boys and girls – Descriptive statistic, t-test

Variables	Gender	Mean±Std.Dev.	t-test	
			t-value	P
FFM of Right Arm	Male	1.51± 0.33	-0.093	0.926
	Female	1.51± 0.43		
% FFM of Right Arm	Male	87.05± 15.94	-3.568	0.001 **
	Female	98.69± 15.62		
FFM of Left Arm	Male	1.50± 0.34	0.044	0.965
	Female	1.50± 0.43		
% FFM of Left Arm	Male	86.77± 16.42	-2.392	0.019 *

	Female	95.29± 17.89		
FFM of Trunk	Male	14.92± 2.33	-0.148	0.883
	Female	15.00± 2.89		
% FFM of Trunk	Male	96.18± 6.93	-4.224	0.000 **
	Female	102.26± 6.98		
FFM of Right Leg	Male	5.06± 0.97	-0.469	0.640
	Female	5.17± 1.31		
% FFM of Right Leg	Male	93.83± 7.05	-3.356	0.001 **
	Female	99.79± 9.73		
FFM of Left Leg	Male	5.04± 0.98	-0.201	0.841
	Female	5.09± 1.21		
% FFM of Left Leg	Male	93.31± 6.88	-3.532	0.001 **
	Female	99.59± 9.86		

p-significance level

* t-test is statistically significant on a level lower than 5%

** t-test is statistically significant on a level lower than 1%

Analyzing the results shown in Table 6, it is noticeable that no t-test is statistically significant. There are no significant differences in the presence

of adipose tissue in the body between boys and girls in the 6th grade of primary school.

Table 6. Differences in body fat representation between the 6th grade boys and girls – Descriptive statistic, T-test

Variables	Gender	Mean±Std.Dev.	t-test	
			t-value	P
BFM of Right Arm	Male	0.84± 0.50	-0.190	0.850
	Female	0.86± 0.54		
% BFM of Right Arm	Male	32.52± 10.95	-0.128	0.898
	Female	32.79± 9.48		
BFM of Left Arm	Male	0.84± 0.49	-0.128	0.899
	Female	0.85± 0.47		
% BFM of Left Arm	Male	32.72± 10.85	-0.288	0.774
	Female	33.31± 9.02		
BFM of Trunk	Male	5.37± 3.76	-0.022	0.982
	Female	5.39± 3.61		
% BFM of Trunk	Male	22.89± 11.68	-0.031	0.975
	Female	22.96± 10.54		
BFM of Right Leg	Male	2.00± 0.94	0.317	0.752
	Female	1.94± 0.85		
% BFM of Right Leg	Male	26.35± 7.95	0.370	0.712
	Female	25.79± 6.83		
BFM of Left Leg	Male	2.00± 0.94	0.317	0.752
	Female	1.94± 0.85		
% BFM of Left Leg	Male	26.36± 7.93	0.373	0.710
	Female	25.79± 6.82		

p-level of significance

Analyzing the results shown in Table 7, differences between 6th grade boys and girls are noticeable. On

average, girls have higher values than boys at the waist-to-hip ratio variables.

Table 7. Differences in the values of the parameters of the waist-to-hip ratio between 6th grade boys and girls – Descriptive statistic, t-test

Variables	Gender	Mean±Std.Dev.	t-test	
			t-value	P
	Male	0.81± 0.04		
WHR	Female	0.82± 0.04	-1.126	0.263

p-level of significance

Based on the results of previous analyzes, it was found that there are statistically significant differences between boys and girls in the values on

DISCUSSION

The results of the research showed that almost half of the 6th grade students (45 students, 47.87%) are overweight or obese. Overweight and obesity are more prevalent in boys than in girls. Out of a total of 44 boys, 26 of them (59.1%) are obese or overweight, while out of a total of 50 girls, 19 (38.0%) are obese or overweight. The obtained results showed that there are certain variations between boys and girls in body composition parameters. Based on the results of the values of t-tests, it can be concluded that there are no statistically significant differences between boys and girls of 6th grade in the above indicators of body composition. Girls have slightly higher values of all indicators of muscle mass. No statistically significant differences were found between boys and girls when it comes to muscle mass values, but significant differences were found when it comes to the percentage of muscle mass on all examined body parts. On average, girls have a significantly higher percentage of muscle mass in the left and right arms, torso, and left and right legs. There are no significant differences in the presence of adipose tissue in the body between boys and girls in the 6th grade of primary school. On average, girls have higher values than boys on the waist-to-hip ratio variables. Based on the results of previous analyzes, it was found that there are statistically significant differences between boys and girls in the values on the variables of the percentage of muscle tissue of the right and left arm, torso, right and left leg. No significant differences were found in the other variables.

Đurković (2012) points out that obesity, in addition to affecting a person's health status, also affects work productivity, as well as financial expenses for the treatment of overweight and obese people. If in this period intensive growth and development are not based on healthy habits, the risk of developing various diseases, both in youth and in adulthood, is inevitable. In our country, as in the region, every third child spends three to five hours a day in front of a computer or TV, which significantly affects weight gain (Despotović, Alexopoulos, Despotović, & Ilić, 2013). The results on a sample of respondents aged 11 to 14 indicate that only 62% of students are properly fed, while 33% fall into the category of overweight and 5% are obese. This fact indicates a

the variables of the percentage of muscle tissue of the right and left arm, torso, right and left leg.

significant and worrying relative increase in body weight and obesity in this age group (Podnar et al., 2013). The human body contains about 19.5% protein, 1-2% glycogen, 8% minerals and 72.5% water, where about 50% is extracellular water (WHO, 1995). The composition of the human body can be observed through two components, namely fat (adipose) and non-fat mass. Fat mass is considered metabolically inactive, however, it plays an important role in hormone metabolism and in adiponectin levels. The lean mass is heterogeneous and extremely metabolically active as it encompasses bone, muscle tissue, extracellular water, nerve tissue, various organs, and all cells except adipocytes (Willett, 2013). Childhood obesity increases the risk of adulthood obesity and is associated with a range of comorbidities, from type 2 diabetes, hypertension, nonalcoholic fatty liver, respiratory distress, and many others. Children are exposed to stigmatization and have poorer socioeconomic status and consequently poorer quality of life and lower life expectancy (Sahoo et al., 2015). The level of child nutrition in Sarajevo Canton shows that 78.10% have normal nutrition, 12.30% are overfed, 7.10% are obese and 2.50% are malnourished (Taljić and Nikšić, 2016). Insight into the Croatian Health Statistics Yearbook issued every year by the Croatian Institute of Public Health, based on data collected from the County Institutes of Public Health and the Institute of Public Health of the City of Zagreb obtained from the School Medicine Services, 3.73% of students were malnourished, 12.85% overweight and 17.74% obese in primary schools. If we exclude children of normal body weight, 34.32% of primary school children are in other categories (Puharić et al., 2016). The results of the research on the body mass index (BMI) of children in the Sarajevo Canton in 2016 show that in the sixth grade there were a total of 3548 respondents, of which 1708 were girls and 1840 boys. Of the total number of respondents of VI grade, included in this study, most respondents had normal TM, 912 (53.4%) girls and 852 (46.3%) boys. Observing separately the respondents of VI grade by gender, overt TM and obesity were more prevalent in boys. More specifically, out of a total of 1840 boys, 424 (23.0%) were overweight and 405 (22.0%) were obese, while, out of a total of 1708 girls, 395

(23.1%) were overweight body weight, and 226 (13.2%) were obese. Comparing the results of the percentage of body mass index by grades (first, third, fifth and seventh) and categories for girls and boys of primary schools in Sarajevo Canton and primary schools in the City of Mostar, we conclude that in Sarajevo Canton there are more children with lower body mass index than normal, and the highest in the first grade 10.3%, while in the City of Mostar this percentage is highest in the seventh grade and amounts to 8.0%. Also, the highest percentage of children with increased body mass index in KS and the City of Mostar is in the fifth grade and amounts to 44.6% for KS and 43.1% for the City of Mostar. When we take into account all the results of the research conducted in KS and the City of Mostar, we come to the conclusion that somewhat more favorable results were obtained by research in the City of Mostar, and that the closest results of KS and the City of Mostar are those recorded in the fifth grade (Abazović et al., 2016; Čolakhodžić et al., 2017). A large study conducted on a sample of respondents aged 11-12 shows that 36.6% of children are overweight and obese (Šimestin Pavić, 2016). According to the World Health Organization (WHO, 2018), childhood obesity is one of the greatest global public health challenges of the 21st century. It is estimated that in the last 40 years, the number of obese school-age children and adolescents has increased as much as tenfold (WHO, 2018). The etiology of childhood obesity is very complex, but eating and living habits play a very important role (Kumar and Kelly, 2017). Observing the general results based on the conducted research of determining the obesity of primary school children in the City of Mostar, in which a total of 1940 students participated, an extremely large number of children with increased body weight was recorded. Of the total number of students included in this study, as many as 36.4% (707) were obese, while 56.1% of children had a normal body weight. In addition, it is worth noting that 7.4% (144) of respondents were malnourished. According to the obtained results, almost every other child has an eating disorder (43.9%), which is extremely worrying and alarming (Čolakhodžić et al., 2017). Although BMI does not show body composition, and thus the proportion of fat that determines obesity (Mišigoj Duraković et al., 2014), the results of the nutritional status of most respondents show obesity, but also in the analysis of body composition a very high proportion of adipose tissue. That is, a comparison of BMI values with adipose tissue percentage shows a positive correlation of data in both sexes. The strong association of BMI with adipose tissue shows that subjects with a higher body mass index also have a higher proportion of adipose tissue. Similar research (Akindele et al., 2016) also confirms the knowledge about the interrelationship between BMI and adipose tissue content. Puberty is a succession of anatomical and physiological changes in early adolescence that mark the transition period from sexually immature to fully mature and is characterized by the development of

reproductive functions, changes in body size, composition and function in response to sex hormones (Perroni, et al., 2018). The study was conducted on a sample of 67 boys and 69 girls, with an average age of 11.56 years. The aim of the study was to determine the degree and differences in the degree of nutrition and body composition in boys and girls of pubertal age. Based on the obtained results, it was determined that there are no statistically significant differences between boys and girls, both in nutrition and body composition in students of VI and VII grade of elementary school. Based on the obtained results, it was determined that there are statistically significant differences between students of VI and VII grade, both in the degree of nutrition and in body composition, estimated by 34 variables using the bioelectric impedance InBody 720. It was found that out of a total of 94 (69.1%) students of VI grade, 27 of them (28.7%) have excessive TM, and 18 (19.1%) are obese, while 48 (51.1%) students of VI grade have a normal TM, and 1 (1.1%) student of VI grade falls into the category of malnourished. Out of a total of 42 (30.9%) students of VII grade, 15 of them (35.7%) have excessive TM, 7 (16.7%) are obese, while 20 (47.6%) students of VII grade have a normal TM, and there were no malnourished. On average, students of VII grades have higher values on total body fluid in the body, the presence of proteins, minerals, bone minerals, lean tissue, muscle mass, skeletal muscle mass, body mass index, muscle mass of the left and right arm and trunk, muscle mass and its percentage in lower extremities, target weight and muscle control in relation to VI grade students. The obtained data indicate a big problem of today, which is conditioned by bad habits and lifestyle. Today's modern society is characterized by markedly reduced motor activity and improper diet, and an increasing number of people whose lifestyle can be described as "sedentary". It is necessary to act preventively on time through more frequent monitoring and analysis of proper growth and development and motivating students to get involved in sports actively or recreationally. The correct habits that are adopted in childhood, in most cases remain in other developmental stages (Nikšić, Beganović, Mekić, 2020). In a study conducted on a sample of 136 students (67 boys and 69 girls), with an average age of 11.56 years, the aim was to determine the degree and differences in the degree of nutrition and body composition in boys and girls of pubertal age. Based on the obtained results, t-test for small independent samples, it was found that there are no statistically significant differences between boys and girls, both in the degree of nutrition and in body composition, estimated by 10 variables using bioelectric impedance InBody 720. It was also found that 19.70% of boys are obese, as well as 17.40% of girls. Collectively, with the percentage of malnourished respondents, a total of 61.50% of boys are not normally fed, as well as 37.70% of girls (Nikšić et al., 2021).

CONCLUSION

Based on data showing that 47.87% of respondents are overweight or obese, it can be concluded that this is a major problem today, which indicates an urgent solution to this health problem through more frequent monitoring and analysis of students, their proper growth and development, inclusion in social communities in problem solving, motivating students for more frequent involvement in various sports activities. The level of nutrition is one of the indicators of the state of the organism and in order to maintain it in normal values, it is necessary to consume a variety of foods, divide daily meals into five smaller ones and adhere to the guidelines of proper nutrition. It is necessary to take in about two liters of fluid, and engage in regular physical activity. This is the only way to burn as many calories as possible so that fat deposits do not accumulate on the stomach and other parts of the body. Be sure to exercise, run or walk 3-5 times a day for 30 to 60 minutes. Prolonged lying down next to the TV or sitting at the computer for a long time should be reduced or eliminated. Daily energy intake in the body should be equivalent to its consumption through daily activities. From all the above we can conclude that physical activity, regardless of age and gender, plays a very important role in preventing obesity. Regardless of the stage of being overweight, controlled physical activity contributes to maintaining optimal health status. It is very important to create the habit of physical exercise at the earliest age in order to later grow into a way of life, and thus affect the quality of life.

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