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DIFFERENCES IN MOTOR ABILITIES BETWEEN BOYS AND GIRLS IV. GRADE OF ELEMENTARY SCHOOL

ABSTRACT: Observing global development, it can be stated that boys and girls are much less physically active than before, which negatively affects the development of motor skills and overall anthropological status. The research was conducted on a sample of a total of $N=450$ IV students. grade of primary school, of which there were $N=238$ (53%) male respondents and $N=212$ (47%) female respondents. The research aimed to determine the differences in motor abilities between boys and girls in the 4th grade of elementary school with the help of the Eurofit battery of tests, namely: Balance (Flamingo), Speed of movement (Tapping with the hand), Flexibility (Grey reach), Explosive leg strength (Jump in standing distance), Static Strength (Hand Strength), Trunk Strength (Supine-Gray), Functional Strength (Squat Endurance) and Running Speed and Agility (Run 10×5m back and forth). The grades were based on the norms of the Eurofit battery of tests for students of IV. primary school grades by gender. Among the statistical methods, the following tests were applied: descriptive statistics and t-test. The statistical processing of the data in this research was done using the computer software SPSS Statistics 20.0 in the operating system Windows 10. By analyzing the results of the t-test, it was determined that there are statistically significant differences in the following tests: Reaching in the gray (Flexibility) and Lying in the gray (Trunk Strength) in favor of boys, and Standing Long Jump (Explosive leg strength) in favor of girls at the level of less than 1% ($p<0.01$). In the tests Flamingo (Balance), Hand Taping (Movement Speed), and Bending Endurance (Functional Strength) the results were in favor of boys, and Hand Strength (Static Strength) and Running 10×5m back and forth (Running Speed and Agility) were in favor of girls and these differences were not statistically significant. Based on the results obtained according to the norms for students IV. grade of primary school, we can conclude that there were a lot of bad grades among IV students. grade of elementary school. The results of motor skills were influenced by the way of spending free time, Body Mass Index (BMI), and playing a certain sport. The data obtained indicate a major problem today, which is caused by a sedentary lifestyle and bad lifestyle habits. Today, students are increasingly exposed to negative environmental influences. Television, computers, tablets, cellphones, and games lead to them spending too much time indoors, sitting. That is why parents, as well as school and society, have the greatest influence on the formation of personality and the adoption of eating habits. Students in elementary

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school buy food independently, and choose what tastes best to them, even though it may not be healthy. It is necessary to act preventively on time and conduct more frequent tests and measurements of elementary school-age students to change and properly grow and develop. Motivate students more to get involved in sports actively or recreationally. Correct habits that are adopted in childhood, in most cases, remain in other developmental stages. What we miss in childhood is hard to make up for later.

KEY WORDS: *Body Mass Index – Eurofit, motor skills – Differences – Gender – Students IV. grade of elementary school*

INTRODUCTION

Observing global development, it can be stated that boys and girls are much less physically active than before. In particular, various media and their excessive and improper use have led to children moving less and spending their time passively, watching TV, playing games, or using various applications on smartphones and devices. More time is spent daily in the virtual world than in physical activity. The time when girls and boys, after school, were outside all day, physically active, is a part of the past. Considering such phenomena in modern society, physical education should play an even greater role in the proper and efficient development of a child. The needs and characteristics of games, which were most often the object of children's interest at these ages, were also considered to be the cause of the development of certain motor skills. The way of life, games, and children's activities have long since changed due to a fast-paced lifestyle with insufficient physical activity, a sedentary lifestyle, and improper nutrition (Matić 2008). Motor skills are important for proper development. Age norms for assessing basic motor skills provide useful diagnostics for "typical" development, but cultural differences in child-rearing practices affect the age at which skills are acquired (Adolph, Hoch 2020). Any sporting activity leads to a certain transformation of motoric and even morphological status. The most important thing is to adapt a certain sports activity to the age with which it is worked so that this activity affects the transformation of students (Rašidagić *et al.* 2000). Some motor abilities are more and some less innate, that is, genetically determined. It is possible to influence certain motor abilities to a greater or lesser extent than others, which depends on the coefficient of innateness of the individual ability, gender, and age. Strength development can be effectively influenced throughout life, while abilities such as speed, coordination, and agility can only be influenced in early childhood. Strength is a motor ability that is 50%

genetically determined, and 50% of this significant motor ability is subject to development throughout life. Unlike strength, speed is 80–95% innate, so the influence on the development of speed is much less possible compared to strength and ranges from 5–20% (Pistotnik 2003). In the conducted research (Đulić 2021), data on the physical activities of the elementary school population were collected and presented. The data were collected using questionnaires, one part of which was related to the use of electronic devices. From them, one can see the continuity of children's low physical activity because about 32.5% of students use a mobile phone for more than 2 hours a day, about 32.5% of students use a computer for more than 2 hours a day, about 32.5% of boys and girls watch television program more than 2 hours a day. To have a greater influence on the development of motor skills, especially those with a higher degree of innateness, it is necessary to start exercising as early as possible (Prskalo 2004). Balance and precision are the least monitored of motor skills in classroom teaching, due to lack of time. There is a whole series of research on the anthropological characteristics of students, both in BiH, Croatia, and abroad. Research is of various types and various purposes. Investigating gender differences in the condition of motility by hereditary factors, it was concluded that genetic factors are more pronounced in females (Mikić 2000). Pejčić (2001) researched 655 students from 1st to 4th grade. The students were examined in 4 morphological variables and 6 motor variables (long jump, 20 m sprint, stand-up with a pull-up, lifting the trunk, and the backstroke polygon). The conclusion is that girls have better results only in mobility and that physical activity, i. e. sports can affect changes in morphological characteristics and motor skills. Transversal research (Prskalo *et al.* 2009) on a sample of 128 male and 117 female students from the 1st to 3rd grade of primary school, divided into subsamples by age and gender, was investigated in 19 anthropometric variables and 12 motor variables (steps to the side, polygon backbends,

various bends, bends on the bench, hand tapping, hand tapping 10", foot tapping on the wall, long jump from a standing position, standing high with a pull-up, raising the trunk and high jump). The conclusion is that the results of motor skills do not show statistically significant differences, justifying the joint organization of work for boys and girls from 1st to 3rd grade of elementary school. The research was conducted on a sample of 400 students of early school age. Anthropometric measurements were carried out with three standard instruments, motor measurements with six instruments (hand tapping, long jump from a standing position, backbend polygon, trunk raising, forward bend, and stand-up pull-up), functional with one test, and motor achievements were assessed using six instruments. The analysis of the state of motor skills and achievements indicates progress in a large part of the motor area, and there is differentiation according to gender, so boys achieve slightly better results compared to girls (Cetinić, Petrić, 2010).

MATERIAL AND METHODS

Participants

The research included a sample of N=450 IV students, grades of primary school divided into two subsamples: 238 (53%) male respondents and 212 (47%) female respondents.

The sample of variables

The variables that were used from the Eurofit battery of tests for the assessment of physical development are height and body mass based on which the Body Mass Index (BMI) was calculated, i.e. the level of nutrition for students IV. grade of elementary school according to gender, and the following tests were used to measure motor abilities: Flamingo (balance), Hand Taping (speed of movement), Reach in the gray (flexibility), Standing long jump (explosive leg strength), Hand strength (static strength), Lying down (trunk strength), Push-up endurance (functional strength), Running 10×5 meters back and forth (running speed and agility).

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

TABLE 1: Categorization of nutrition based on percentiles. Centers for Disease Control and Prevention, 2000 (Kuczmarski *et al.* 2002).

BMI	Percentile	Weight
BMI ≥	95 th percentile	Obesity
BMI =	85–95 th percentile	Overweight
BMI =	5–85 th percentile	Normal weight
BMI ≤	5 th percentile	Malnutrition

recommendations of the Centers for Disease Control and Prevention, 2000 (Kuczmarski *et al.* 2000) *Table 1*.

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 through research were processed with descriptive and comparative statistics. Arithmetic means and standard deviation for each variable were calculated from the space of descriptive statistics, while the t-test for small independent samples was used to determine differences. The statistical program for personal computers SPSS for Windows version 22 was used for data processing.

RESULTS

TABLE 2: Descriptive statistics related to Body Height, Body Mass, and BMI by gender. Legend: Male - ♂; Female - ♀; Min. - Minimum value; Max. - Maximum value; Mean - arithmetic mean; Std. Dev. - standard deviation.

Variables	Gender	Mean ± Std.Dev.
Body Height (cm)	♂	144.33 ± 7.27
	♀	143.33 ± 7.74
Body Weight (kg)	♂	39.79 ± 10.43
	♀	37.61 ± 9.34
Body Mass Index (kg/m ²)	♂	18.97 ± 4.22
	♀	18.14 ± 3.39

Table 2 presents the results of the basic parameters of descriptive statistics, arithmetic mean (Mean), and standard deviation (Std.Dev.) for body height, body mass, and Body Mass Index (BMI), boys and girls IV. grade of elementary school. The average height for boys IV. class is 144.33 cm, and the weight is 39.79 kg, while the average value for BMI is 18.97. Average height value for girls IV. class is 143.33 cm, and the weight is 37.61 kg, while the average value for BMI is 18.14.

TABLE 3: Differences in Body Mass Index (BMI) between boys and girls IV. elementary school grades – Descriptive statistics, t-test. Legend: Male – ♂; Female – ♀; p – significance level; * t – the test is statistically significant at the less than 5% level; ** t – the test is statistically significant at the less than 1% level.

Variables	Gender	t-test	
		t-value	p
Body Mass Index (kg/m ²)	♂	17.84	
	♀	11.50	0.02 **

Analyzing the results shown in Table 3, we can notice that there are statistically significant differences between boys and girls IV. elementary school class in BMI.

Table 4 shows the percentile values for the BMI variable, based on which it is possible to see the state of nutrition of IV students. elementary school classes by gender. Looking at boys and girls separately, it can be noted that malnutrition is most prevalent in boys, and also in girls IV. grade of elementary school. Obesity

and overnutrition are more common in boys than in girls, which negatively affects the results of motor skills. Out of a total of 238 (53%) boys, 17 of them are obese, 8 boys are excessively nourished, 78 boys are normally nourished, and 135 boys are malnourished. Out of a total of 212 (47%) girls, 6 of them are obese, 1 girl is excessively nourished, 81 girls are normally nourished, and 124 girls are malnourished. The average Body Mass Index (BMI) for boys and girls is 20. A very high percentage of malnourished children is evident, so we can say that today's big problem is not only obesity in children but also malnutrition. The obtained data indicate the problems that currently exist. These problems are caused by bad lifestyle and eating habits. Modern society is characterized by significantly reduced motor activity, improper nutrition, and an increasing number of people whose lifestyle can be described as "sedentary". It is necessary to act preventively by more frequent monitoring and analysis of the correctness of growth and development and by motivating young people to actively or recreationally engage in sports. In most cases, the correct habits that are adopted in childhood remain in other stages of development (Nikšić *et al.* 2020). Children's nutrition can be assessed based on clinical examination, laboratory procedures, and anthropometric measurements. Height and body mass are most often used to determine nutrition. Children and adolescents who are at risk of being overweight often become obese. The obtained results indicate the need for a more extensive review of the analyzed segments and a significantly larger sample of respondents, to act preventively in the fight against obesity, as the leading epidemiological health problem of today. It is obvious that physical activity based on physical education classes is not sufficient or is not

TABLE 4: Frequencies and percentage values of body mass index by category for students IV. primary school grades by gender.

Nutritional status	Boys			Girls		
		Percentiles	%		Percentiles	%
	N			N		
Obesity	17	≥95	7.14	6	≥95	2.83
Overweight	8	85–95	3.37	1	85–95	0.48
Normal weight	78	5–85	32.77	81	5–85	38.20
Malnutrition	135	<5	56.72	124	<5	58.49
Total	238		100.0	212		100.0

TABLE 5: Presentation of students' leisure time IV. primary school grades by gender.

Leisure activities	Boys	Girls	Total
Watching TV	75	68	143
Playing games	133	67	200
Training	102	92	194
Using tablets and computers	98	72	170
Using mobile phones	177	127	304
Reading books and studying	17	59	76

represented enough to respond to the challenges of the modern lifestyle of children (Nikšić *et al.* 2021).

Looking at *Table 5*, looking at boys and girls separately for the total sample of student respondents IV. primary school class N=450, it can be observed that boys spend more time playing games, as well as using a tablet, computer, and phone. They watch more TV in their free time compared to girls, and there is a slightly higher number of boys who train and do sports compared to girls, but it is certainly necessary to take into account the total number of male respondents N=238, who were 26 more of girls, of whom there were N=212. Girls read books and study more in their free time compared to boys. Respondents had the opportunity to give several answers to the question.

In their free time, students read books, play games on a computer, tablet, or PlayStation, and talk on their cell phones. Girls read books and talk on mobile phones more than boys in their free time, while boys spend more time than girls playing games on the computer or PlayStation. Possible reasons why girls spend more time reading and talking on mobile phones may be because they are more focused on school achievements and social contacts. During puberty, girls have a strong urge for social contact, which could be the reason for more frequent use of cell phones to talk, than is the case with boys. Girls are more oriented towards visual media than boys (Ilišin 2001).

Table 6 shows the sports activities of IV students. primary school grades by gender. Out of a total of 450 respondents IV. grade of primary school, there were 238 (53%) male respondents and 212 (47%) female respondents. Out of a total of 238 male respondents, 102 (43%) of the respondents played sports in their free time, and 136 (57%) of the male respondents did not play any sports. Out of a total of 212 female respondents,

TABLE 6: Presentation of sports activities of students IV. primary school grades by gender.

Sports	Boys	Girls	Total
Yes	102	92	194
Athletics	/	23	23
Ballet	/	1	1
Folklore	/	8	8
Basketball	7	5	12
Football	100	4	104
Swimming	11	13	24
Taekwondo	/	9	9
Handball	4	9	13
Tennis	/	20	20
No	136	120	256
Total	238	212	450

92 (43%) participated in sports in their free time, and 120 (57%) female respondents did not do any sports. Based on the obtained results, it can be concluded that a greater number of male respondents were engaged in sports, although the difference is small, the fact that there were more male respondents compared to female respondents should not be ignored. A greater number of female respondents engaged in more different sports compared to male respondents. Although numerous studies show that girls are more flexible than boys and that boys have better strength, the obtained results showed that engaging in certain sports activities also affected certain results of motor skills. The largest number of female respondents were involved in athletics, which had a positive effect on the results of explosive strength and running speed and agility, where girls achieved better results compared to boys who did not engage in athletics at this age. The largest number of male subjects played football, which had a positive effect on the results of flexibility, speed of movement, functional strength, and trunk strength, where boys achieved better results compared to girls. The variety of sports played by the female respondents, including sports that contribute to the development of static strength, also contributed to better results in the hand strength test.

Table 7 shows motor skills (euro fit battery of tests) for IV students. elementary school classes according to gender by established norms.

TABLE 7: Presentation of grades of students' basic motor skills IV. primary school grades by gender. Legend: Male – ♂; Female – ♀; 1 – bad; 2 – below average; 3 – average; 4 – above average; 5 – excellent.

Variables	Balance Flamingo		Movement speed Tapping by hand		Flexibility Reaching in gray		Explosive Leg power Standing long jump		Static power Fist strength		Troop strength Lying gray		Functional Strength Push-up endurance		Running Speed and agility Running 10×5m back and forth	
Grades	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂
1	74	61	38	38	35	41	25	36	22	28	16	23	21	20	32	56
2	68	90	36	28	34	41	25	42	43	58	57	36	57	62	29	30
3	47	54	54	60	41	45	29	59	30	57	18	39	42	57	57	103
4	17	27	51	73	58	43	71	34	82	48	83	79	52	44	59	48
5	6	6	33	39	44	68	62	67	35	47	38	61	40	55	35	1
Total	212	238	212	238	212	238	212	238	212	238	212	238	212	238	212	238

For the flamingo test, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 2, 90 respondents, while the smallest number of respondents had a score of 5, 6 respondents. The largest number of female respondents IV. the class had a score of 1, 74 respondents, while the smallest number of respondents had a score of 5, 6 respondents. Observing the total sample of female respondents IV. the class compared to male respondents, we can conclude that boys had less bad grades (grade 1) and girls less bad grades (grade 2) for the flamingo test (balance), while boys had better grades (grade 4) in comparison to girls, and boys and girls scored 5 equally, while more boys scored 3 than girls. Based on the above, we can conclude that the results of the flamingo test are in favor of boys, although the difference was relatively small and the results were not statistically significant. Although the results this time are in favor of boys, it should be taken into account that there were 26 more male respondents than girls.

For the hand tapping test, the results are as follows: the largest number of male respondents IV. grade of primary school had a score of 4, 73 respondents, while the smallest number of respondents had a score of 2, 28 respondents. The largest number of female respondents IV. class had a rating of 3, 54 respondents, while the smallest number of respondents had a rating of 5, 33 respondents. Observing the total sample of

female respondents IV. grade compared to male respondents, we can conclude that boys had fewer worse grades (grade 2), and grade 1 was equally given by boys and girls for the hand tapping test (movement speed), while grade 3 was given by more boys compared to girls. Based on the above, we can conclude that the results of the hand-tapping test are in favor of boys, although the results were not statistically significant.

For the test reaching in gray, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 5, 68 respondents, while the smallest number of respondents had a score of 1 and 2, 41 respondents. The largest number of female respondents IV. class had a rating of 4, 58 respondents, while the smallest number of respondents had a rating of 2, 34 respondents. Observing the total sample of female respondents IV. class compared to male respondents, we can conclude that girls had fewer worse grades (grades 1 and 2) for the gray reaching test (flexibility) compared to boys, while boys had better grades (grade 5) and girls more better grades (grade 4), and grade 3 had more boys than girls, although the number was almost equal. Based on the above, we can conclude that the results of the gray reach test are in favor of boys. Girls are in most cases much more flexible. Although the results this time are in favor of boys, it should be taken into account that there were 26 more male respondents compared to girls, and girls also had worse grades than boys.

For the standing long jump test, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 5, 67 respondents, while the smallest number of respondents had a score of 4, 34 respondents. The largest number of female respondents IV. the class had a score of 5, 67 respondents, while the smallest number of respondents had a score of 1 and 2, 25 respondents. Observing the total sample of female respondents IV. the class compared to male respondents, we can conclude that girls had fewer worse grades (grades 1 and 2) for the standing long jump test (explosive strength) compared to boys, while boys had better grades (grade 5), and girls had better grades (grade 4), and more boys had grade 3 than girls. Based on the above, we can conclude that the results of the long jump test are in favor of girls.

For the hand strength test, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 2, 58 respondents, while the smallest number of respondents had a score of 1, 28 respondents. The largest number of female respondents IV. class had a rating of 4, 82 respondents, while the smallest number of respondents had a rating of 1, 22 respondents. Observing the total sample of female respondents IV. class compared to male respondents, we can conclude that girls had fewer worse grades (grades 1 and 2) for the hand strength test (static strength) compared to boys, while boys had better grades (grade 5) and girls more better grades (grade 4), and more boys than girls had a grade 3. Based on the above, we can conclude that the results of the hand strength test are in favor of girls, although the difference is not statistically significant.

For the gray lying test, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 4, 79 respondents, while the smallest number of respondents had a score of 1, 23 respondents. The largest number of female respondents IV. the class had a rating of 4, 83 respondents, while the smallest number of respondents had a rating of 1, 16 respondents. Observing the total sample of female respondents IV. class compared to male respondents, we can conclude that boys had fewer worse grades (grades 1 and 2) for the lying down test (trunk strength) compared to girls, but also more better grades (grades 4 and 5), and grade 3 had more boys than girls. Based on the above, we can conclude that the results of the lying down test are in favor of boys.

For the pull-up test, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 2, 62 respondents, while the

smallest number of respondents had a score of 1, 20 respondents. The largest number of female respondents IV. class had a rating of 2, 57 respondents, while the smallest number of respondents had a rating of 1, 21 respondents. Observing the total sample of female respondents IV. the class compared to male subjects, we can conclude that boys had less bad grades (grade 1) and girls had less bad grades (grade 2) for the test of endurance in a squat (functional strength). Boys had better grades (grade 5), and girls more better grades (grade 4), and grade 3 was more common among boys than girls. Based on the above, we can conclude that the results of the push-up test are in favor of boys, although the results were not statistically significant.

For the 10×5m back-and-forth test run, the results are as follows: the largest number of male subjects IV. grade of primary school had a score of 3, 103 respondents, while the smallest number of respondents had a score of 5, 1 respondent. The largest number of female respondents IV. the class had a rating of 4, 59 respondents, while the smallest number of respondents had a rating of 2, 29. Observing the total sample of female respondents IV. the class compared to male respondents, we can conclude that girls had fewer worse grades (grades 1 and 2), as well as better grades (grades 4 and 5) for the test run 10×5 m back and forth (running speed and agility), and grade 3 had more boys than girls. Based on the above, we can conclude that the results of the 10×5m back-and-forth test are in favor of girls compared to boys, although the results were not statistically significant.

Analyzing the results shown in *Table 8*, it is noticeable that there are certain differences in motor skills between boys and girls from IV. grade of elementary school. By analyzing the results of the t-test, it was determined that there are statistically significant differences in the following tests: Reaching in the gray (Flexibility) and Lying in the gray (Body strength) in favor of boys, and Long jump from a standing position (Explosive leg strength) in favor of girls at a lower level of 1% ($p < 0.01$). In the tests Flamingo (Balance), Hand Taping (Movement Speed), and Bending Endurance (Functional Strength) the results were in favor of boys, and Hand Strength (Static Strength) and Running 10×5 m back and forth (Running Speed and Agility) were in favor of girls and these differences were not statistically significant.

TABLE 8: Differences in motor abilities between boys and girls IV. grade of elementary school – Descriptive statistic, t-test. Legend: sec/stot – seconds/hundredths; cm/mm – centimeters/millimeters; kg/g – kilogram/gram; number – number of repetitions; min/sec/stot – minutes/seconds/hundredths; Male – ♂; Female – ♀; Mean – arithmetic mean; Std. Dev. – standard deviation; p – significance level; * t – the test is statistically significant at the less than 5% level; ** t – the test is statistically significant at the less than 1% level.

Variables	Gender	Mean ± Std.Dev.	t-test	
			t-value	p
Balance	♂	00:10:53 ± 0.01	0.00009	0.99
Flamingo (sec/stot)	♀	00:10:52 ± 0.01	0.00012	
Movement speed	♂	00:21:53 ± 0.04	0.00163	0.36
Tapinng by hand (sec/stot)	♀	00:18:25 ± 0.00	0.00002	
Flexibility	♂	3.02 ± 6.77	45.86	0.00 **
Reach in gray (cm/mm)	♀	8.25 ± 8.26	68.31	
Explosive leg power	♂	133.60 ± 22.73	516.78	0.00 **
Standing long jump (cm/mm)	♀	126.03 ± 23.40	547.70	
Static power	♂	16.11 ± 4.93	24.32	0.10
Fist strength (kg/g)	♀	15.39 ± 4.42	19.54	
Troop strength	♂	18.63 ± 5.62	31.64	0.01 **
Lying gray (number)	♀	17.15 ± 5.98	35.72	
Functional strength	♂	00:18:44 ± 0.01	0.00009	0.23
Push-up endurance (min/sec/stot)	♀	00:16:57 ± 0.01	0.00015	
Running speed and agility	♂	01:12:49 ± 0.16	0.02699	0.56
Running 10×5 m back and forth (sec/stot)	♀	01:00:35 ± 0.15	0.02162	

DISCUSSION

Many authors obtained similar results in their research. There are many opinions that motor skills are better developed in boys, which come from more intensive movement in preschool and younger school age.

The research conducted on a sample of 655 girls and boys from the first to the fourth grade of elementary school investigated the influence of physical and health

culture on the change of the anthropological space. Four morphological and six motor ability tests were applied. It can be concluded that physical activity has a positive influence on morphological characteristics and motor abilities and that girls only showed better values in flexibility (Pejičić 2001). The research was conducted on a sample of 437 respondents in the fifth and sixth grades, of which there were 213 girls and 224 boys. Boys had higher values of body height (ATV) and body mass (ATM). In motor skills, boys were also more

dominant in tests used to assess coordination (MKPN, MKUS, and MKSLT) and explosive strength (MESD, and METR20 MEBML). The flexibility assessment tests (MFLPRK, MFLPR, and MFLPRJ) were dominated by girls. The results of tests used to assess repetition strength (MRSPT, MRSCUC, and MRSZTL) show slightly higher values for boys. The results of the tests used to assess the speed and frequency of movement (MBTR, MBTN, and MBTNZ) show that there is no numerical difference between boys and girls (Badrić 2011). In the 10×5m back-and-forth test, according to gender, female subjects had a better result than male subjects. Male test subjects achieved better results than female test subjects in the body flexion test. By increasing mobility, the overall motor efficiency increases, and the stability of the locomotor system is raised to a higher level. Flexibility develops more easily in children and younger people, so its development should be planned at the age of 11–14 (Prskalo *et al.* 2009). In most motor skills, boys are better than girls. A higher level of motor skills in boys is due to a faster flow of impulses from the cerebral cortex to the effectors in the muscles. Each newly learned activity enriches the motor skills of a child at a younger school age, which is particularly reflected in his general motor ability (Lončar 2011). In the research conducted on a sample of respondents of N=83 students from 1st to 3rd grade of primary school, there were 213 girls and 224 boys. The results at the descriptive level show that there are minor differences in some variables, but they are not statistically significant. It can be said that the only statistically significant difference between male and female subjects was found in the test: Standing long jump. Male subjects have better standing long jump results than female subjects and this difference is statistically significant ($F=10.3209$ and $p<0.01$). The results of the test for measuring flexibility: Bending of the torso, ie. "bench bending" is not statistically significant, but also in favor of boys, although girls were expected to do better because they are considered to be more flexible than boys. Regarding the test for measuring the speed of movement: Taping by hand according to gender, based on the obtained results, it can be concluded that the female subjects had a better result, compared to the male subjects. Regarding the test for measuring repetitive strength: Raising the trunk from lying down with bent legs, based on the results obtained at the descriptive level, it can be concluded that male subjects have better results compared to girls. Statistically significant improvement was not achieved in the test for measuring running speed and agility:

Running 10×5 m back and forth. This was expected considering that speed as a motor ability is to a significant extent genetically determined. The absence of gender differences within the same age group is expected for the developmental period of younger school age, given that children of that age, regardless of gender, develop relatively parallel, i.e. changes during growth and development in both boys and girls are mostly simultaneous (Nikšić *et al.* 2017). On a sample of 118 students (of which 61 boys and 57 girls), from I-IV grades of Zagreb elementary schools, aged 7–10, the students were measured in 7 motor variables. In the first grade, when determining differences by gender, the test of the explosiveness of strength "long jump from a standing position" proved to be significant. In the second grade, there are significant differences in the "backward polygon", "hand tapping in 15 seconds", "standing long jump" and "standing high jump" tests. In the third grade, the "backward polygon", "bench bend" and „hand tapping in 15 seconds“ tests are significant. In the fourth grade, the coordination test "backward polygon" proved to be significant. The results of measuring the "bend on the bench" test are statistically significant only for boys and girls in the third grade. Usually, girls are more flexible than boys, so it should be noted that in this case, exceptionally, third and fourth-grade boys show better results. In the "hand tapping in 15 seconds" test, statistically significant differences are seen in the second and third grades. If we compare the results with the valid norms, we see that the boys' results are above average in the first and third grades, and excellent in the second and fourth. The results of girls in the second grade are average, while in the first and fourth grades, they are above average. The results in the third grade are excellent, which is consistent with the fact that girls are better than boys at that age. Statistically significant differences between boys and girls in the standing long jump test are seen in first and second grade. If we compare the results of the boys with the normative values, we see that there is no progress in the measured motor ability. Hence, the boys in the first grade are above average, in the second grade average, in the third grade below average, and in the fourth grade even worse. Girls are bad only in the second grade, in the first and fourth they are below-average, while in the third they are above-average and better than boys of the same age. There were no statistically significant differences between boys and girls in the lower grades of elementary school on the "trunk lifting" test. The boys are average in the first grade, but they are improving, and in the other grades

they are above average. The girls are average in the first grade, above average in the second, and even excellent and better than their peers in the third. In the fourth grade, girls' results are again average (Lončar 2011). On a sample of 324 respondents aged 6 to 11, the authors investigated the difference in motor skills between boys and girls. To assess motor skills, 14 field tests were applied that tested aerobic and anaerobic endurance, flexibility, repetitive strength, explosive strength, speed, agility, balance, and maximal isometric strength. Boys proved to be dominant and statistically significantly better than girls in aerobic and anaerobic endurance, speed, agility, explosive strength, and maximal isometric strength. Girls are statistically significantly better in flexibility and balance (Marta *et al.* 2012). On a total sample of 568 subjects, of which 273 were boys and 295 were girls, the authors investigated the differences in motor abilities between boys and girls in the fourth and fifth grades of elementary school. Tests were applied that measured speed, where boys in both classes showed statistically significantly better results. In the fourth grade, girls showed better results in bending forward and sitting, and with that, better flexibility. The boys had the repetitive strength of the abdominal muscles and showed better results in both classes. Boys in both grades showed better results in long jump tests to assess explosive strength and hand grip to assess maximal isometric strength (Flanagan *et al.* 2012). Budimlić (2016) researched a sample of 843 students from sixth to ninth grade. As part of the work, he tested the differences between boys and girls in certain motor skills. The tests that were applied examined the area of flexibility, explosive strength of the lower extremities, repetitive strength of the abdominal muscles, static strength of the forearm, upper arm and back muscles, coordination, and endurance test. All tests, except the flexibility test, showed a statistically significant difference from sixth to ninth grade in favor of boys. Flexibility, which was measured by the sit-up test, showed a statistically significant difference in favor of girls from sixth to ninth grades. Halaši (2016) in his research on a sample of a total of 214 respondents, of whom 101 girls and 113 boys aged 8 years from Subotica, under the title "Body structure and motor status as predictors of the quality of life of younger school-aged children", tested motor skills, anthropometric measures, assessment of body composition, tests to assess the development of gross motor skills and measures related to health-related quality of life. According to his conclusion, there is a statistically significant difference between boys and girls in running 20 meters, and long

jump from a standing position in favor of boys, while squatting showed better results in favor of girls.

CONCLUSION

This research was conducted to determine the differences in motor abilities between boys and girls IV. grade of elementary school. The research was conducted on a sample of N=450 students, of which there were N=238 (53%) male respondents and N=212 (47%) female respondents. To assess basic motor skills, the Eurofit battery of tests was applied, namely: Balance (Flamingo), Speed of movement (Hand tapping), Flexibility (Grey reach), Explosive leg strength (Standing long jump), Static strength (Hand strength). The results of the research showed that there are statistically significant differences in the following tests: Reaching in the gray (Flexibility) and Lying in the gray (Trunk Strength) in favor of boys, and Standing Long Jump (Explosive leg strength) in favor of girls at a level of less than 1% ($p < 0.01$). In the tests Flamingo (Balance), Hand Taping (Movement Speed), and Bending Endurance (Functional Strength) the results were in favor of boys, and Hand Strength (Static Strength) and Running 10×5 m back and forth (Running Speed and Agility) were in favor of girls and these differences were not statistically significant. Based on the results obtained according to the norms for students IV. grade of primary school, we can conclude that there were a lot of bad grades among IV students. grade of elementary school. The results of motor skills were influenced by the way of spending free time, Body Mass Index (BMI), and playing a certain sport. The data obtained indicate a major problem today, which is caused by a sedentary lifestyle and bad lifestyle habits. This should draw people's attention and point out the importance of sports for the health of children at school. Reduced physical activity in children leads to major changes in overall development, especially in motor skills. This is where the importance of physical activity in growth and development comes to the fore, which is the only practical means of raising the value of motor skills, including the entire anthropological status, and restoring and improving the student's abilities. It is necessary to include as many children as possible in additional physical activities, considering that the teaching of physical and health education is not enough to cause significant changes in the children's organism. Any sporting activity leads to a certain transformation of motor skills. The most important thing is to adapt

a certain sports activity to the age with which it is being worked, for that activity to influence the transformation of students.

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