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The effects of physical education on changes of basic motor skills of female students in the fifth grade of elementary school

Nikšić E.[1ABCDE], Beganović E.[2ABCDE], Rašidagić F.[2ACE], Mirvić E.[2CDE], Joksimović M.[3ADE]

[1]*Faculty of Educational Sciences, University of Sarajevo, Bosnia and Herzegovina*
[2]*Faculty of Sport and Physical Education, University of Sarajevo, Bosnia and Herzegovina*
[3]*Faculty of Physical Education and Sport, University of East Sarajevo, Bosnia and Herzegovina*

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Abstract

Purpose: Thanks to the positive health effects of physical exercise, physical education is an integral part of the education system, with two hours per week, which is insufficient to achieve an optimal effect in transforming the anthropological status of children. The aim of the research was to determine the effects of regular and modified physical education with the application of contents from sports games (basketball, volleyball and handball) in the duration of one semester to changes in basic motor skills in pupils of the fifth grade of elementary school.

Material: The study included N = 106 students of the V class, aged 10 to 11 years, clinically and mentally healthy, and with no pronounced morphological and locomotor impairments. The sample of examinees was divided into two subgroups. The first was an experimental group of 53 students, who carried out physical education classes according to the modified plan and program of sports games (basketball, volleyball and handball) for a semester. The other was a control group of 53 students who attended regular classes from physical education according to the current curriculum.

Results: The results of the research at the descriptive level showed noticeable differences between the same groups in the final versus the initial measurements. Based on the results of the t-test for the control and experimental group, it can be concluded that there have been statistically significant changes in values on all variables of basic motor in the final compared to the initial measurement. By analyzing the results of the t-tests, it can be seen that the groups differ in the initial measurement only in one basic motor variable, MTAPN, and this difference is statistically significant in favor of the control group. In the final measurement, there are no significant differences between the control and the experimental group in the average values of all variables of basic motoring.

Conclusions: Improving basic motor skills depends on the teacher's ability, the ability to transform the age with which he is working, and the success of certain training processes. The modified program of the experimental group has led to changes and thus proves the significant effect of the group's work program.

Keywords: physical education, modified program, sports games, motor skills, students.

Introduction

The need for physical exercise is one of the general biological needs of an organism and plays an important role in its life. The connection of physical activity with the state of human health is indisputable, it is the basic factor in determining the level of changes in the organism and the condition of its bone, muscle, cardiovascular and nervous system. The process of physical exercise leads to certain transformations and enhancements in functional abilities and individual organic systems [1]. Coordination is the ability to control the movements of the whole body or parts of the locomotor system, and is characterized by the speed and precise execution of complex motor assignments [2]. The methodology for the development of coordination in the period of 10-11 years has the following guidelines: increase the level of coordination capacities compared to the previous period, develop coordination used in the learning of sports skills, and encourage children to perform exercises for the development of coordination in their free time.

Coordination exercises require a high concentration. They affect the nervous system and quickly tickle it. For this reason, it is best to train the coordination at the beginning of the main part or even at the end of the introductory part of the training (class). During the exercise, it is necessary to take some breaks for recovery between repetitions. Certain processes of exercise significantly influence changes in different human traits, abilities and knowledge. But there is always the current question: "How much, what and how to practice the changes, and how to control the variability in quantitative and qualitative terms" [3]. Speed is the ability to perform one or more movements in a shorter period of time [2]. In order to be able to develop a speed that is genetically limited in good measure, the following conditions must be met: morphological, energy, psychological, coordination techniques, power levels, sustainability and flexibility.

The sensitive stage in the development of speed in girls is between 7 and 11 years. The development of speed in girls lasts up to 14 years and after that stagnates if girls do not deal with systematic physical exercise. A similar sensitivity phase is with boys. Only boys have an intensive period of 7-9 years, and after 14th they continue to develop speeds up to 18 years. In the development of speed, the following methodical instructions must be followed: to carry out the learned grid structures faster than the

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average speed; first it is necessary to train at a speed less than the maximum, and when the technique is adopted at a high level, then the technique can be performed at the maximum speed, train according to the principles: from easy to heavy, from simple to complex and from known to unknown, connect speed exercises with techniques of a particular sport, change speed development exercises, change the conditions in which the speed is developing, increase the number of repetitions, and not the duration of repetition, use long pauses. Rest in principle lasts from one to three minutes, use long and basic warming and take advantage of the sensible phases of the development of speed. In children, it is recommended that exercises are not performed at the maximum intensity, because performing exercises with maximum intensity in children causes the emergence of the so-called. speed barriers [4].

Power can be defined as the ability to overcome resistance and force. There are several types of action manifestations of force: explosive force, maximum power, elastic strength, repetitive force, static power [2]. The sensitive phase of the development of individual power types is diverse. Thus, for the explosive strength, the sensitive phase is from 12-13 years, from 12-15. During the year, static power is growing faster in boys than in girls. In developing children's strength, particular methodical instructions must be followed. Power exercises should have the character of the game, because the game is a major driver of activity for children. Exercising in groups is much more effective and makes satisfaction. The exercises must correspond to the biological development of the child, where exercises must be individualized. The intensity and extent of the sea must be adapted to the children. In addition to the power exercises in the preparation part of the clock, a positive effect would cause the application of the game content, where the accent would be in effect, in the "B" part of an hour. The methodological instructions of the training aim to alert us that the systematic development of power should only begin when the active and passive part of the movement system takes the appropriate strength. In the development of strength in children and young people, it is necessary to influence the development of repetitive power by applying dynamic exercises.

The most suitable methods used to develop the power are: low-load out-load methods (up to 30 s), medium-load circuits in the form of circular training, up to 10 drills, and up to 20 repetitions, high- 10 exercises with 10 reps [4]. Flexibility is the ability to perform maximum amplitudes of movement in an ankle or a series of joints. The basic types of flexibility are dynamic, static passive and statically active [2]. At the age of 6-10. The mobility of shoulders and hooks is reduced, and dynamic stretching of the same joints is necessary at that time. The spine column in the period of 8 and 9 years has the greatest flexibility. At the age of 6-10 it is necessary to avoid static stretching because children of that age are hard to maintain concentration and relaxation, which is crucial for these exercises. In the period from 10-13. It is important to increase the flexibility training, since increased exercise activity without increased application of stretching exercises can lead to a decrease in the amplitude of the movement. In the age of accelerated growth and development, it is crucial to apply flexibility training exercises, because then there is an accelerated bone growth, and muscles and tendons can not be tracked. Basic methodological guidelines for the development of childhood flexibility: to apply flexibility in a moderate extent, to connect the development of flexibility and strength, to work on the flexibility of precisely determined joints and to apply dynamic flexibility exercises in training children [4]. Physical education of two hours a week can hardly fully satisfy the need for movement. In some instances, there is a lack of motivation for physical exercise in children, and they try to avoid active participation in classes in all possible ways. In the physical education classes, students have four sports games: handball, basketball, football and volleyball. Sports games are characterized by varied natural movements. All these movements are applied in the conditions of cooperation between the teammates.

The effectiveness of the game depends to a great extent on the speed of movement, perception of space and players in it, from the adoption of the technique of movement, and the level of motor and general abilities. The place of sports games in the teaching of physical education is not accidental. Participation in sports games is characterized by intense muscular, psychological and functional activity, which results in a positive impact on the biopsychosocial development of the child [5]. Skender, [6] in his doctoral dissertation: "Transformation processes of motor skills and anthropological characteristics under the influence of seven-month treatment in students of the third and fourth grade" on a sample of 206, divided into two subusers (experimental and control), applied standard and experimental treatment for a period of seven months. The results showed that three-hour experimental treatment performed by professors of physical education showed better results than the standard physical education program conducted by class teachers. Stanković and Hadžikadunić, [7] in their research: "The influence of programmed physical education on the changes in motor skills in one-year students", resulted in the result that 70 hours of physical and health education in one year led to changes in all tested motor skills. The variables were the capabilities covered by tests from the eurofit battery test. Kucuk, [8], on a sample of 110 pupils (boys and girls), 11 - 13 years of age, determines statistically significant changes in the structural process of motor dimensions of initial and final measurement, under the influence of the curriculum. A discriminatory analysis designed to define quantitative changes occurring at two time points indicates that the variables for the estimation of equilibrium (flamingo), long jump (explosive power), lying seat (repetitive force of the hull) and then the variable 10x5 statistically significantly changed. Lakota, [9] in his master's thesis on the sample of 82 handball players 11-14 years of age tried to determine the qualitative and quantitative changes in basic situational motor skills created under the influence of the three-month program

of handball. For this purpose, methods for qualitative-structural changes were used: LSDF model, CRAMERT model, QDIFFI model and Krzanow model, and for quantitative GK criteria. A 52-course handball program program produced statistically significant changes in the treated areas. Skender, et al., [10] in his paper "Effects of programmed classes on improving motor skills in pupils of younger age groups", found that the programmed three-hour training for seven and seven months caused positive effects on the improvement of motor skills that were included in the testing. Hadžikadunić, [11], on a sample of 146 male students, identified transformation processes under the influence of programmed physical and health education for 69 hours of instruction in basic motor, situational and motor skills and functional abilities of students of the eighth grade.

A system of variables of 8 tests for basic motor abilities and 9 tests for the assessment of specific motor abilities was used, and one test for the evaluation of functional abilities. It was found that programmed teaching has a positive effect on improving basic motor, situational and functional abilities between two measurements. Batričević, [12] in his paper: "A discriminatory analysis of the motor and functional abilities of sports active and inactive students", on a sample of 64 students, divided into two subusers (sports active and inactive students). He established the existence of a difference between the two subroutines. The results of the study show that sports active students are better in tests for estimating explosive power, segmental velocity, vital lung capacity, and systolic and diastolic blood pressure. Mladenović, [13], in his paper " The structural changes in sports games during physical and health education classes" on the sample of 152 students, carried out the contents of sports games in the teaching of physical education in the course of one school year. By applying the treatment, the level of structural changes in basic and specific motors was attempted.

The results of this program have shown a general, systematic, continuous reconstruction of general and specific motor abilities, therefore the transformation process is responsible, although not in all situations to the same extent. The weakest effects are captured in the case of football. Nikolić et al., [14] in his paper: "The Impact of Experimental Treatment on Some Motor Performance of Fourth-Grader Students", on a sample of 104 students, applied treatment to the change in motor skills in tests for estimating the segmental velocity of the extremities, the explosive force . The Chinese treatment did not cause changes in the flexibility and static strength variables, which are influenced by the longitudinal dimension of the skeleton, that is, the static strength test is too heavy for the selected sample. Malacko and Pejić, [15] have studied the changes of biomotor pupils aged 11 years under the influence of the experimental program of sports games in relation to the standard program of physical education. The sample was made up of 252 male students, who were divided into a control and experimental group. A system of 33 variables (12 morphological and 21 for the estimation of motor and functional abilities) was used. The experimental program was saturated with the content of sports games, and the results indicate that the morphological system contributes to the equal differentiation of the group, whereas in the motor space better results were shown by the experimental group of 14 variables that showed a statistically significant difference in 13 variables were better than the experimental group.

The aim of the research is to determine the effects of regular and modified physical education with the application of contents from sports games (basketball, volleyball and handball) in the duration of one semester to changes in basic motor skills in pupils of the fifth grade of elementary school.

Material and Methods

Participants

The study was conducted on a sample of N = 106 pupils in V grade, female, aged 10 to 11 years, clinically and mentally healthy, and with no pronounced morphological and locomotor impairments. The sample of examinees was divided into two subgroups, an experimental (53 pupils) and a control group (53 students). The experimental group conducted classes according to the changed curriculum. The program included sports games from handball, basketball and volleyball. The control group carried out the teaching according to the current curriculum.

Research Design

The variables used in this study consisted of 15 motor variables:

- Variables for estimating the frequency of the movement (Tapping by hand - MTAP; Tapping the leg - MTAPN; Tapping the feet against the wall - MTAPNZ).
- Variables for flexibility assessment (Stick turn - MFLISK; Reach in the seat - MBFDS; Precoding right - MPD).
- Variables for estimating explosive power (Long Distance Jump - MFESDM; High Jump from the Site - MFESUM; High Speed Sprint 20m - MFE2OV).
- Variables for estimating repetitive power (Leak test-test - MRCLDM; Test squad for 40 seconds - MFRDC; Sketches - MFRSKL).
- Variables for assessing coordination (Steps aside - MAGKUS; Magnetic Test - MAGTUP; Polygon Background - MRGEPOL).

Work program

During the first semester, three teaching units were processed as part of regular classes: athletics, basketball and volleyball. A total of 35 teaching hours of regular physical education were held, of which 12 hours of athletics, 12 hours of basketball, 11 hours of volleyball. The program of additional classes through the basketball, volleyball and handball sports games consisted of a modified curriculum from basketball: adding and catching balls from basketball, running a ball with a stop, a basketball technique, a low-lead technique, a kick-off practice with zipper positions, zigzag guiding, one - handed addition, moving the ball with arms in motion,

running the ball with stop in the position of the shot, ball manipulation, pivoting technique with the ball, straight line guidance from high to low, and vice versa. From the volleyball sports, some teaching units were used, for example: adding a hammer, fingering over the net, school service, mini volleyball, hammering over the head, refusing the ball from the wall, adding alternating fingers - a hammer, school service with six and nine meters, jumping from dockyards on the net, shooting a basket with a hammer. From the handball, the teaching units worked as follows: foreclosure, lateral addition, jumping, kicking on the goal, slalom, handball, straight tracking, mini handball, goal kicking - seven, manipulation with a handball, Shade Adding, Adding To The Triples Game 1: 1 Shot on goal. Only girls were involved in this program and for this reason football was not taken as a sport game.

Statistical Analysis

A descriptive statistical procedure was applied in the data processing process. The following descriptive parameters are calculated: Minimum, Maximum, Mean, Standard Deviation, while to calculate the distribution: Skewness and Kurtosis. The T-test determined differences in variables for assessing the motor abilities of the initial and final measurement of the control and experimental group. Statistical data processing in this study was done using computer software SPSS statistics 20.0 in Windows 10.

Results

Table 1 gives an overview of the average values of the control and experimental group on the basic motor variables in the initial and final measurements. There are noticeable differences between groups in different measurement situations on all these variables. There are also differences between the average values of the same group in the final compared to the initial measurements. Of course, these differences are present at the descriptive level and can only reflect random variations. According to the values of the flattening and curvature index in Table 1, it can be concluded that most of the basic motor variables in initial and final measurements are normally and symmetrically distributed and can be further analyzed.

However, according to the values of the Skewness and the Kurtosis, some variables are noticeable and deviations. Thus, with acceptable values of Skewness, and values of Kurtosis greater than 1, symmetrical but

Table 1. Display of average values and deviation measures on basic motor variables - Control and experimental group initially and final

Variables	Group	Min.		Max.		Mean		Std.Dev.		Skewness		Kurtosis	
		IT	FT	IT	FT	IT	FT	IT	FT	IT	FT	IT	FT
MTAP	Control	21.00	24.00	34.00	36.00	27.30	29.85	2.74	2.82	0.32	0.34	-0.04	-0.51
	Experimental	20.00	21.00	37.00	37.00	28.09	30.21	4.01	3.50	0.14	-0.21	-0.27	0.17
MTAPN	Control	15.00	20.00	30.00	36.00	24.57	26.70	2.79	2.84	-0.78	0.49	1.71	1.49
	Experimental	15.00	16.00	29.00	33.00	22.66	26.68	2.71	3.22	-0.28	-0.38	0.57	1.00
MTAPNZ	Control	12.00	16.00	22.00	26.00	18.74	21.26	2.25	2.53	-0.88	-0.35	0.96	-0.28
	Experimental	13.00	14.00	30.00	32.00	19.36	21.53	3.26	3.10	0.57	0.83	1.22	2.31
MFLISK	Control	29.00	29.00	106.00	101.00	71.89	62.96	15.91	14.92	0.08	0.42	0.23	0.33
	Experimental	27.00	15.00	109.00	98.00	74.57	63.40	18.63	17.72	-0.27	-0.32	-0.37	-0.06
MBFDS	Control	3.00	6.00	50.00	52.00	21.30	23.28	7.83	7.75	0.63	0.66	2.84	2.87
	Experimental	2.00	6.00	32.00	33.00	19.38	21.30	7.06	6.64	-0.51	-0.64	-0.44	-0.32
MPD	Control	14.00	22.00	67.00	73.00	42.17	46.98	11.35	10.61	-0.14	0.08	0.02	0.22
	Experimental	19.00	24.00	60.00	64.00	42.36	45.96	9.91	10.06	-0.36	-0.29	-0.19	-0.52
MFESDM	Control	100.00	105.00	195.00	210.00	147.17	157.26	24.91	24.49	-0.01	-0.13	-0.98	-0.37
	Experimental	90.00	110.00	195.00	195.00	148.68	159.15	25.06	22.91	-0.23	-0.37	-0.56	-0.59
MFESUM	Control	15.00	17.00	39.00	44.00	26.72	29.53	5.22	5.44	-0.03	0.34	0.15	0.60
	Experimental	14.00	18.00	42.00	43.00	26.49	29.72	5.57	5.38	0.48	0.48	1.45	0.79
MFE20V	Control	3.57	3.53	5.38	5.09	4.31	4.10	0.41	0.36	0.36	0.53	-0.54	-0.28
	Experimental	3.62	3.44	5.88	5.38	4.41	4.08	0.55	0.47	0.92	0.94	0.15	0.32
MRCLDM	Control	10.00	15.00	27.00	31.00	20.60	23.45	4.03	4.01	-0.36	0.01	-0.27	-0.67
	Experimental	10.00	15.00	32.00	33.00	21.42	24.49	4.77	4.25	0.00	0.20	0.34	-0.51
MFRDC	Control	20.00	23.00	45.00	47.00	31.25	35.43	5.57	5.42	0.05	-0.53	-0.36	-0.04
	Experimental	10.00	21.00	46.00	49.00	29.72	35.04	7.60	6.59	-0.48	-0.29	0.30	-0.51
MFRSKL	Control	1.00	1.00	36.00	41.00	8.21	12.00	8.78	10.48	1.39	0.99	1.30	0.20
	Experimental	1.00	1.00	40.00	53.00	11.04	15.81	9.86	11.99	1.04	0.88	0.74	0.89
MAGKUS	Control	10.50	9.68	14.87	14.56	12.87	12.01	1.17	1.18	-0.15	0.12	-0.91	-0.79
	Experimental	9.28	9.15	16.19	15.00	13.04	11.97	1.61	1.38	-0.32	0.00	-0.63	-0.56
MAGTUP	Control	27.06	25.56	39.24	36.34	31.18	29.44	2.73	2.50	0.70	1.02	0.28	0.71
	Experimental	25.07	24.03	45.06	39.06	32.17	29.93	4.02	3.30	0.62	0.53	0.65	-0.03
MRGEPOL	Control	12.69	9.63	40.69	35.38	22.82	17.78	6.52	5.22	0.98	1.24	0.85	1.97
	Experimental	12.75	10.97	46.93	35.06	22.08	18.47	6.57	5.44	1.31	1.12	3.21	1.30

Legend: IT-initial testing, FT-final testing.

somewhat elongated (leptocutaneous) distribution of the results of the control group on the MTAPN variable was observed, both in the initial and final measurements and in the experimental group on the MFESUM variable in the initial measurement. In the final measurement, MFESUM was normally distributed.

In the initial measurement, it was found that the Skewness and Kurtosis of the control group were greater than 1 when the MFRSKL variable was concerned, indicating leptocutaneous and mildly positive asymmetric distribution while the experimental group Kurtosis is acceptable and the MFRSKL Skewness indicates mild positive asymmetry. When the distribution of results on the variable MRGEPOL is positive, the control group is positively asymmetric and elongated (Skewness and Kurtosis greater than 1) in the final measurement, and in the experimental group in the initial measurement. However, it is noteworthy that these deviations of the normalities are mild since the Kurtosis and the Skewness do not deviate drastically from the reference interval but are slightly above the boundary. For this reason, no transformations have been made because the greater benefit of retaining the original values of these variables and their entering into further analysis is estimated.

From the above table of t-tests, it can be seen that groups differ in the initial measurement only in one basic motor variable, MTAPN. On average (the table with average values, column M), the control group subjects have higher values on this variable ($M_{control}$ = 24.57 a $M_{experimental}$ = 22.66). This difference in MTAPN is statistically significant in favor of the control group. In other variants of basic motor, there are no statistically significant differences between the control and experimental groups in the initial measurement.

As seen from the above table of t-tests, none of the t-tests is statistically significant at any level of significance. Thus, it can be concluded that in the final measurement there are no significant differences between

Table 2. T-test value basic motor for independent samples control and experimental group initial measurement

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
MTAP	7.47	0.01	-1.19	104.00	0.24	-0.79	0.67	-2.12	0.53
			-1.19	91.91	0.24	-0.79	0.67	-2.12	0.53
MTAPN	0.05	0.83	3.57	104.00	0.00	1.91	0.53	0.85	2.97
			3.57	103.91	0.00	1.91	0.53	0.85	2.97
MTPNZ	4.77	0.03	-1.15	104.00	0.25	-0.62	0.54	-1.70	0.46
			-1.15	92.31	0.26	-0.62	0.54	-1.70	0.46
MFLISK	1.75	0.19	-0.80	104.00	0.43	-2.68	3.36	-9.35	3.99
			-0.80	101.52	0.43	-2.68	3.36	-9.35	4.00
MBFDS	0.12	0.73	1.33	104.00	0.19	1.92	1.45	-0.95	4.80
			1.33	102.89	0.19	1.92	1.45	-0.95	4.80
MPD	0.48	0.49	-0.09	104.00	0.93	-0.19	2.07	-4.29	3.92
			-0.09	102.15	0.93	-0.19	2.07	-4.29	3.92
MFESDM	0.11	0.74	-0.31	104.00	0.76	-1.51	4.85	-11.13	8.12
			-0.31	104.00	0.76	-1.51	4.85	-11.13	8.12
MFESUM	0.00	0.98	0.22	104.00	0.83	0.23	1.05	-1.85	2.31
			0.22	103.56	0.83	0.23	1.05	-1.85	2.31
MFE20V	3.13	0.08	-1.07	104.00	0.29	-0.10	0.09	-0.29	0.09
			-1.07	95.61	0.29	-0.10	0.09	-0.29	0.09
MRCLDM	0.21	0.65	-0.95	104.00	0.35	-0.81	0.86	-2.51	0.89
			-0.95	101.18	0.35	-0.81	0.86	-2.51	0.89
MFRDC	2.85	0.09	1.18	104.00	0.24	1.53	1.29	-1.04	4.10
			1.18	95.34	0.24	1.53	1.29	-1.04	4.10
MFRSKL	0.66	0.42	-1.56	104.00	0.12	-2.83	1.81	-6.43	0.77
			-1.56	102.62	0.12	-2.83	1.81	-6.43	0.77
MAGKUS	5.83	0.02	-0.62	104.00	0.53	-0.17	0.27	-0.71	0.37
			-0.62	95.06	0.53	-0.17	0.27	-0.71	0.37
MAGTUP	7.20	0.01	-1.48	104.00	0.14	-0.99	0.67	-2.31	0.34
			-1.48	91.48	0.14	-0.99	0.67	-2.31	0.34
MRGEPOL	0.01	0.92	0.58	104.00	0.57	0.73	1.27	-1.79	3.26
			0.58	103.99	0.57	0.73	1.27	-1.79	3.26

Table 3. T-test value basic motor for independent samples control and experimental group final measurement

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
MTAP	1.22	0.27	-0.58	104.00	0.56	-0.36	0.62	-1.58	0.87
			-0.58	99.57	0.56	-0.36	0.62	-1.58	0.87
MTAPN	1.27	0.26	0.03	104.00	0.97	0.02	0.59	-1.15	1.19
			0.03	102.39	0.97	0.02	0.59	-1.15	1.19
MTPNZ	0.52	0.47	-0.48	104.00	0.63	-0.26	0.55	-1.35	0.83
			-0.48	99.90	0.63	-0.26	0.55	-1.36	0.83
MFLISK	1.68	0.20	-0.14	104.00	0.89	-0.43	3.18	-6.74	5.88
			-0.14	101.06	0.89	-0.43	3.18	-6.75	5.88
MBFDS	0.01	0.92	1.41	104.00	0.16	1.98	1.40	-0.80	4.76
			1.41	101.61	0.16	1.98	1.40	-0.80	4.76
MPD	0.00	0.96	0.51	104.00	0.61	1.02	2.01	-2.96	5.00
			0.51	103.71	0.61	1.02	2.01	-2.96	5.00
MFESDM	0.14	0.71	-0.41	104.00	0.68	-1.89	4.61	-11.02	7.25
			-0.41	103.54	0.68	-1.89	4.61	-11.02	7.25
MFESUM	0.20	0.66	-0.18	104.00	0.86	-0.19	1.05	-2.27	1.90
			-0.18	103.99	0.86	-0.19	1.05	-2.27	1.90
MFE20V	2.54	0.11	0.22	104.00	0.83	0.02	0.08	-0.14	0.18
			0.22	97.11	0.83	0.02	0.08	-0.14	0.18
MRCLDM	0.22	0.64	-1.29	104.00	0.20	-1.04	0.80	-2.63	0.56
			-1.29	103.64	0.20	-1.04	0.80	-2.63	0.56
MFRDC	3.02	0.09	0.34	104.00	0.74	0.40	1.17	-1.93	2.72
			0.34	100.26	0.74	0.40	1.17	-1.93	2.72
MFRSKL	0.30	0.59	-1.74	104.00	0.08	-3.81	2.19	-8.15	0.53
			-1.74	102.17	0.08	-3.81	2.19	-8.15	0.53
MAGKUS	0.86	0.35	0.16	104.00	0.87	0.04	0.25	-0.45	0.53
			0.16	101.61	0.87	0.04	0.25	-0.45	0.53
MAGTUP	5.24	0.02	-0.87	104.00	0.39	-0.49	0.57	-1.62	0.64
			-0.87	96.83	0.39	-0.49	0.57	-1.62	0.64
MRGEPOL	0.01	0.92	-0.67	104.00	0.51	-0.69	1.04	-2.75	1.36
			-0.67	103.82	0.51	-0.69	1.04	-2.75	1.36

the control and the experimental group in the average values of all variants of basic motoring. It is notable that there are no differences between groups and variables for which there were no statistically significant differences in the initial measurement as well as for the variables for which significant differences in the initial measurement were shown. As previous analyzes have shown, in the initial measurement it has been proven that the control group has statistically significantly higher values on the MTAPN variables ($M_{control}$ = 24.57 and the $M_{experimental}$ = 22.66). However, the significance of the difference is lost in the final measurement, and it can be concluded that the effect of the experimental group program has led to changes that have resulted in a significant difference in the benefit of the control group.

In the next part of the paper t-tests for dependent samples for the control group were made in order to see if there were changes in the average values of the basic motor after the work program, ie, in the final measurement and whether these changes are statistically significant.

As can be seen from the table above, all t-tests are statistically significant at a level far below 1%. So, when it comes to the control group, there were statistically significant changes in the values on all variables of basic motor in the final versus the initial measurement.

As seen from the table above, all t-tests are statistically significant at levels that are far less than 1%. Thus, in the experimental group there were significant changes in values on all variables of basic motor in the final measurement and in relation to the initial measurement. Although similar changes occurred among the control group subjects, this finding is in favor of the experimental group, as it demonstrates the significant effect of the program's work program. Thus, after the program of work in the experimental group there was significant increase of values on the variables MTAP, MTAPN, MTPNZ,

Table 4. T-test values basic motor control group

Variables	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
MTAP	96.40	105.00	0.00	28.58	27.99	29.16
MTAPN	87.98	105.00	0.00	25.63	25.05	26.21
MTAPNZ	76.34	105.00	0.00	20.00	19.48	20.52
MFLISK	43.41	105.00	0.00	67.42	64.34	70.50
MBFDS	29.35	105.00	0.00	22.29	20.79	23.80
MPD	40.99	105.00	0.00	44.58	42.42	46.73
MFESDM	62.44	105.00	0.00	152.22	147.38	157.05
MFESUM	52.73	105.00	0.00	28.12	27.07	29.18
MFE20V	109.28	105.00	0.00	4.20	4.13	4.28
MRCLDM	53.36	105.00	0.00	22.03	21.21	22.85
MFRDC	58.57	105.00	0.00	33.34	32.21	34.47
MFRSKL	10.61	105.00	0.00	10.10	8.22	11.99
MAGKUS	102.73	105.00	0.00	12.44	12.20	12.68
MAGTUP	113.71	105.00	0.00	30.31	29.78	30.84
MRGEPOL	32.64	105.00	0.00	20.30	19.06	21.53

Table 5. T-test values basic motor experimental group

Variables	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
MTAP	77.09	105.00	0.00	29.15	28.40	29.90
MTAPN	70.85	105.00	0.00	24.67	23.98	25.36
MTAPNZ	62.83	105.00	0.00	20.44	19.80	21.09
MFLISK	37.49	105.00	0.00	68.98	65.33	72.63
MBFDS	30.40	105.00	0.00	20.34	19.01	21.67
MPD	45.00	105.00	0.00	44.16	42.21	46.11
MFESDM	64.77	105.00	0.00	153.92	149.20	158.63
MFESUM	50.88	105.00	0.00	28.10	27.01	29.20
MFE20V	81.40	105.00	0.00	4.25	4.14	4.35
MRCLDM	49.69	105.00	0.00	22.95	22.04	23.87
MFRDC	44.04	105.00	0.00	32.38	30.92	33.83
MFRSKL	12.36	105.00	0.00	13.42	11.27	15.58
MAGKUS	81.27	105.00	0.00	12.51	12.20	12.81
MAGTUP	83.50	105.00	0.00	31.05	30.31	31.79
MRGEPOL	33.27	105.00	0.00	20.28	19.07	21.48

MBFDS, MPD, MFESDM, MFESUM, MRCLDM, MFRDC and MFRSKL. On the long run, there has been a significant decrease in the values of variables MFLISK, MFE20V, MAGKUS, MAGTUP and MRGEPOL. As you can see the pattern of changes in values on the basic motor variables is the same as in the control group. However, significant changes indicate a significant effect of the work program on the values of all measured basic motor components in the experimental group.

Discussion

In the conducted research, anthropometric measures and motor abilities were assessed on a sample of 47 third-grade students who are engaged in additional physical activity or training in basketball in the section of the school sports society and who participate only in the regular teaching of physical and health culture. The results showed that students exercising additional physical exercise have significantly better results in motor skills, as well as a noticeable increase in muscle mass. The results of the t-test in the area of motor abilities show significant differences that occur in variables for estimating explosive (MSD), repetitive (MPT), and static power (MIV) for the benefit of students who exercise physically. Similarly, statistically significant differences were found in the flexibility assessment (MPR) and the simple movement rate (MTR) variable. A statistically significant difference was not found in the Coordinating Assessment Variable

(MPN), although there is a numerical difference in the results of the polygon backlash test for the benefit of additional physical activity students [16].

The results of the research Badrić et al., [17] show that after the training process lasting 8 weeks, statistically significant changes in the motor skills of the girls who were engaged in additional extracurricular activities in the school sports society were created. Similar results were obtained in their research [18, 19, 20, 21]. Girls progressed most in tests to assess explosive power and flexibility, but also significantly reduced agility performance. The results of this study show that significant differences appear in these abilities, while the differences in the coordination area are minimal. Additional physical activity within the work of a school sports society significantly influences the increase in the level of motor skills. Some previous research has found that transformational changes in motor skills are emerging in older girls who attend primary school. This research has shown obvious differences with nine-year-old girls. The results of the research Nićin, [22] and Petković, [23] show that additional physical activity increases the positive effects of both physical development and basic-motor abilities. From the obtained results, it is concluded that for more substantial transformations in the motor space, additional content is needed outside the teaching, assuming that the transformation of basic motor skills is greater when the higher level of motor knowledge is higher. The results show that additional involvement in kinesiological activity, and in this case it is basketball, with the regular teaching that forms the basis of all organizational forms of work in this area, ensures significant transformational effects. This affirms the value of sports in its best form, which is preparation.

Kinesiological contents are also shown here as a powerful generator of human adaptability as a self-improvement system. In this case, this is a school sport, which, considering the trends in the reduction of the standard of citizens, must be counted. School sport is the only choice for a large part of the population, and society should take responsibility for making exercise available to every child regardless of the material status of parents [17]. In his research: "A discriminatory analysis of the motor and functional abilities of sports-active and inactive students", on a sample of 64 students, divided into two sub-assemblies (sportively active and inactive students), the author established the existence of a difference between two sub-classes. The results of the study show that sports active students are better in tests for estimating explosive power, segmental velocity, vital lung capacity, and systolic and diastolic blood pressure [12]. In his doctoral dissertation: "Transformational processes of motor skills and anthropological characteristics under the influence of a seven-month treatment for third-and fourth-graders" on a sample of 206, divided into two subunits (experimental and control), a standard and experimental treatment of seven months. The results showed that three-hour experimental treatment performed by professors of physical education showed better results than the standard physical education program conducted by class teachers [6]. In his research: "The influence of programmed physical education on changes in motor skills in one-year students", the results of 70 hours of physical and health education in one year led to changes in all tested motor skills. Variables were the capabilities included in the tests of the Eurofit battery test [7].

On a sample of 110 pupils (boys and girls) 11 - 13 years, statistically significant changes were found in the structural process of motor dimensions of initial and final measurement, under the influence of the curriculum. A discriminatory analysis was done with the aim of defining quantitative changes that took place at two time points. Indicates that variables for balance estimation (flamingo), long jump (explosive power), tracking force (repetitive power of the hull), then the variable 10x5 have significantly changed significantly. The author also concludes that both boys and girls have the capacity to balance at both ages [8]. In his research: "The Effects of Programed Teaching on Improving Motor Skills in the Young Scholar Students" found that the programmed three-hour instruction for a week and seven months caused positive effects on improving motor skills, which were included in the testing [10]. In his paper: "The Impact of Experimental Treatment on Some Motor Abilities of Fourth-Grader Students", on a sample of 104 students, using the treatment resulted in a change in motor skills in tests for estimating the segmental velocity of the limbs, explosive forces. The Chinese treatment did not cause changes in the flexibility and static strength variables, which are influenced by the longitudinal dimensionality of the skeleton, that is, the static strength test is too heavy for the selected sample [14]. In the study of the change of biomotor pupils aged 11 years under the influence of the experimental program of sports games in relation to the standard physical education program, the sample was composed of 252 male students, which were divided into a control group and experimental group. A system of 33 variables (12 morphological and 21 for estimation of motor and functional abilities) was used. The experimental program was saturated with the contents of sports games. The results indicate that the morphological system contributes to the equal differentiation of the group, while the experimental group showed better results in the motor space, of which 14 variables showed a statistically significant difference in 13 variables. The experimental group was better [15]. In a study conducted on 153 subjects, 48 respondents participated in regular physical education with 2 hours of instruction. This was the first experimental group - E1. 56 subjects participated in regular physical education with 2 classes, plus the third extra hour per week. This was second experimental group - E2, with which professors of physical and health culture worked. The rest of 49 respondents participated in regular physical education classes with class teachers, with 2 lessons per week (control group - K). There were statistically significant changes in motor abilities in the final relative to the initial measurement in experimental groups relative to the control. On the basis of the obtained results it can be assumed that the proper methodological

formulation of teaching work (physical exercise, load, methods for the development of certain abilities forms and forms of work, etc.) has had positive effects on motor skills when it comes to girls of third grade primary school [24].

This research was conducted with the aim of determining the effects of regular and modified physical education with the application of content from sports games (basketball, volleyball and handball) in the duration of one semester to changes in basic motor skills in primary school students in the fifth grade. The sample of respondents included 106 pupils in the V class, aged 10 to 11 years, clinically and mentally healthy, and with no pronounced morphological and locomotor impairments. The sample of respondents was divided into two subgroups, an experimental group (53 pupils), who carried out physical education classes according to the modified plan and program of sports games (basketball, volleyball and handball) for a semester and a control group (53 pupils) who attended regular classes from physical education according to the current curriculum. The variables used in this study consisted of 15 motor variables and variables for estimating the frequency of the movement (Tapping Hand - MTAP; Tapping Leg - MTAPN; Tapping Legs on the Wall - MTAPNZ); variables for assessing flexibility (stick turn - MFLISK; MFESDM; MFESUM; High Jump 20m - MFE2OV), variables for the estimation of the repetitive power (Test (MBFDS; laying-seat - MRCLDM; 40 seconds squash test - MFRDC; Push-ups - MFRSKL) and variables for assessing coordination (Steps aside - MAGKUS; Magnetic Test - MAGTUP; Polygon backwards - MRGEPOL). Descriptive statistics and T-test were used to determine changes in basic motor skills. The results of the research at the descriptive level showed noticeable differences between the same groups in the final versus the initial measurements. Based on the results of the t-test for the control and experimental group, it can be concluded that there have been statistically significant changes in values on all variants of basic motor in the final compared to the initial measurement. Thus, after the program of work in the experimental group there was significant increase of values on the variables MTAP, MTAPN, MTPNZ, MBFDS, MPD, MFESDM, MFESUM, MRCLDM, MFRDC and MFRSKL. On the long run, there has been a significant decrease in the values of variables MFLISK, MFE20V, MAGKUS, MAGTUP and MRGEPOL. Changes in the values of the basic motor variables are the same as for the control group. However, significant changes indicate a significant effect of the work program on the values of all measured basic engine components in the experimental group. By analyzing the results of the t-tests, it can be seen that the groups differ in the initial measurement only in one basic motor variant, MTAPN, and this difference is statistically significant in favor of the control group. In the final measurement, there are no significant differences between the control and the experimental group in the average values of all variants of basic motoring.

Conclusion

The results of this study have shown that the application of any physical education program can lead to changes in basic motor abilities in the final versus the initial measurement, regardless of the time period, if the lesson is performed. In order for the differences between the control and the experimental group to be greater and statistically significant, it is necessary to increase the weekly number of hours of physical education compared to the existing one or to include pupils in additional physical activity. The lifestyle of today's students is mainly reduced to sitting in school and at home with a computer, tablet or phone, IT workshops, music schools and foreign language schools. Therefore, students continue to sit in a sitting position with minimal movement after classes. This way of life, such poor and fast food, leads to the students' abilities becoming more and more lagging behind their physical development.

Conflicts of Interest

The authors declare no conflict of interest.

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Information about the authors:

Nikšić E.; (Corresponding author); http://orcid.org/0000-0002-1849-9693; elvira.beganovic1982@gmail.com; Faculty of Education Science, University of Sarajevo; 71000 Sarajevo, Bosnia and Herzegovina.

Beganović E.; http://orcid.org/0000-0002-5190-6035; edinn.beganovic@hotmail.com; Faculty of Physical Education and Sport, University of Sarajevo; 71000 Sarajevo, Bosnia and Herzegovina.

Rašidagić F.; http://orcid.org/0000-0002-1153-5719; faris.rasidagic@gmail.com; Faculty of Physical Education and Sport, University of Sarajevo; 71000 Sarajevo, Bosnia and Herzegovina.

Mirvić E.; http://orcid.org/0000-0003-0537-117X; edinmirvic@gmail.com; Faculty of Physical Education and Sport, University of Sarajevo; 71000 Sarajevo, Bosnia and Herzegovina.

Joksimović M.; http://orcid.org/0000-0003-4232-5033; nicifor007@outlook.com; Faculty of Physical Education and Sport, University of East Sarajevo; 71420, Pale, Bosnia and Herzegovina.

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