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DIFFERENCES BETWEEN BOTH BOYS AND GIRLS SIXTH GRADERS OF ELEMENTARY SCHOOLS IN SOME MOTOR SKILLS AND MORPHOLOGICAL CHARACTERISTICS

Summary

This study was done among sixty fifth graders male and female pupils of Primary School in East Sarajevo 12 years old (± six months). The sample was divided into two subgroups according to the gender. It consisted of 30 female students and 30 male sixth grade students. The aim of this research is to determine the differences between both male and female sixth grade Primary School students in some motor abilities and anthropometric characteristics. The purpose of this research was to improve the quality of work in the ordinary Physical Education classes. The four motor tests were applied: for assessment of segment speed with hand tapping -MTAP; for troop strength lifting troops for 30sek.-MD30; for the flexibility of a deep forward bend on the bench - MDPK and for explosive power jump from a place MSDM. For the assessment of morphological characteristics the height of the body was measured - AVIS, weight - ATEZ, the upper arm - AOND and skin fold of the upper arm - ANDL. The measurement was carried out according to the procedures suggested in the study.

Keywords: *girls and boys, T-test, discriminatory analysis, morphological characteristics and motor abilities*

1 INTRODUCTION

Research of the differences between boys and girls in regular Physical Education classes is based on proper planning and programming of the teaching process. This is particularly important in the period between 10 and 14 years old pupils when the differences between the sexes are more and more evident. Proper training stimulus is basis of harmonious development of anthropological characteristics of students.
In the planning and programming of training, special attention is paid to the development of motor skills that are somewhat determined by the genotype (gene structure inherited from parents), and to a large extent are developed under the influence of transformational processes.
Targeted training for the development of motor abilities and morphological characteristics has the best effects in a certain period of life (7-17 years), and biological maturity significantly affect motor performance. Biological maturity affects motor performance differently among boys and girls. Previous studies (Durakovic, 2007) show that girls who grow faster have better results in motor performance of those who slowly enter the stage of maturity (11-13 years). Differences between the individuals in a population concerning the motor performance are dependent on the growth and development, especially among male students (Bompa,

2006).
The aim of this research is to determine the differences between male and female sixth grade students of Primary Schools in some motor abilities and anthropometric characteristics with the aim of improving the quality of work in the ordinary physical education classes.

METHOD

The study was conducted on 60 male and female students in the fifth grade of Primary School in East Sarajevo, 12 years (± six months) old. By gender, the sample was divided into two subgroups as follows: 30 female students and 30 male students in the sixth grade.

For the assessment of motor abilities of students, standard motor and anthropometric measurement instruments were selected. (Kurelić et al., 1975).
Four motor tests were applied: for assessment of segment speed hand tapping -MTAP; for troop strength lifting troops for 30sek.-MD30; for the flexibility, deep forward bend on the bench- MDPK and explosive power jump from a place MSDM.

For the assessment of morphological characteristics the height of the body was measured-AVIS, weight - ATEY, volume of the upper arm - AOND and the skin fold of the upper arm - ANDL. The measurement was carried out according to the procedures proposed in the study Lohman, Roche, and Martorell. (1988).

Data were analyzed on the basis of the statistical program SPSS Statistics 12.0 and 5.0

3 RESULTS

3.1 Basic statistical parameters

Table 1: Basic statistical parameters of anthropometric measures of morphological characteristics among boys

Antrop. measures	N	Mean	Min.	Max.	Std.dev.	Skewn.	Kurtos.
AVIS	30	154.43	150.00	160.00	0.52	0.245	1.022
ATEŽ	30	44.26	38.00	50.00	0.64	0.524	-0.120
AOND	30	21.84	19.00	25.00	1.11	0.236	1.487
AKND	30	9.52	6.20	15.40	5.87	0.122	0.522

Explanation: mean (Mean), minimum (Min), the maximum (Max), standard deviation (Std. dev.), skjunis (Skewn.), kurtozis (Kürtösi)
The obtained results in Table 1 for boys in the area of anthropometric measures of morphological characteristics indicate that there are no statistically significant differences between the results of the respondents and the normal distribution. Results of measures which have been appraised for morphological characteristics of the respondents indicate that the distribution is positive. To confirm the results of the asymmetry of distribution (skjunis) not exceeding 1.00 which means that the tests are not heavy (up to +1.00) or light (up to -1.00), but correspond to the research population and below the unit. Homogeneity results (kurtozis) indicates that there is a good sensitivity (discrimination tests), since the obtained value below 2.75.

Table 2: Basic statistical parameters of the motoric characteristics tests among the boys

Motoriski testovi	N	Mean	Min.	Max.	Std.dev.	Skewn.	Kurtos.
MTAP	30	35.64	32.00	40.00	10.16	0.059	-2.547
MD30	30	18.27	14.00	22.00	11.50	0.208	-2.132
MDPK	30	32.53	30.00	37.00	5.05	0.750	2.085

MSDM	30	160.54	138.55	186.45	12.20	0.170	2.583

Explanation: mean (Mean). minimum (Min). the maximum (Max). standard deviation (Std. dev.). skjunis (Skewn.). kurtozis (Kürtösi.)

Displayed results in Table 2 among the boys in the area of motor skills in the final measurements indicate that there is no statistically significant difference between the results and the normal distribution. The test results, which were assessed motor skills of the respondents indicate that the distribution is positive. To confirm the results of the asymmetry of distribution (skjunis) not exceeding 1.00 which means that the tests are not heavy (up to +1.00) or light (up to -1.00), but correspond to the research population and below the unit. Homogeneity results (kurtozis) indicates that there is a good sensitivity (discrimination tests), since the obtained value below 2.75.

Table 3: Basic statistical parameters of anthropometric measures morphological characteristics among the girls

Antrop. measures	N	Mean	Min.	Max.	Std.dev.	Skewn.	Kurtos.
AVIS	30	155.97	151.00	161.00	5.12	0.715	2.206
ATEŽ	30	45.54	39.00	51.00	2.02	0.129	0.100
AOND	30	22.25	19.00	25.00	7.00	0.414	-0.104
AKND	30	13.63	8.80	18.60	1.12	0.712	1.406

Explanation: mean (Mean). minimum (Min). the maximum (Max). standard deviation (Std. dev.). skjunis (Skewn.). kurtozis (Kürtösi.)

The obtained results in Table 1 for girls in the area of anthropometric measures of morphological characteristics indicate that there are no statistically significant differences between the results of the respondents and the normal distribution. Results of measures which have been appraised for morphological characteristics of the respondents indicate that the distribution is positive. To confirm the results of the asymmetry of distribution (skjunis) not exceeding 1.00 which means that the tests are not heavy (up to +1.00) or light (up to -1.00), but correspond to the research population and below the unit. Homogeneity results (kurtozis) indicates that there is a good sensitivity (discrimination tests), since the obtained value below 2.75.

Table 4: Basic statistical parameters of the mototic characteristics tests among the girls

Motoric tests	N	Mean	Min.	Max.	Std.dev.	Skewn.	Kurtos.
MTAP	30	34.24	30.00	38.00	15.55	0.042	1.562
MD30	30	12.85	8.00	16.00	1.31	0.169	0.303
MDPK	30	39.83	35.00	43.00	11.12	0.024	2.006
MSDM	30	147.62	128.35	166.25	3.15	0.502	1.236

Explanation: mean (Mean). minimum (Min). the maximum (Max). standard deviation (Std. dev.). skjunis (Skewn.). kurtozis (Kürtösi.)

Displayed results in Table 2 among the girls in the area of motor skills in the final measurements indicate that there is no statistically significant difference between the results and the normal distribution. The test results, which were assessed motor skills of the respondents indicate that the distribution is positive. To confirm the results of the asymmetry of distribution (skjunis) not exceeding 1.00 which means that the tests are not heavy (up to +1.00) or light (up to -1.00), but correspond to the research population and below the unit. Homogeneity results (kurtozis) indicates that there is a good sensitivity (discrimination tests), since the obtained value below 2.75.

3.2. Differences between boys and girls in the anthropological characteristics

Table 5 Multivariate analysis of variance of morphological characteristics between boys and girls

Wilks' Lambda	Rao's R	Q
.174	5.54	**.000**

Explanation: Values of Bertletov' test (Wilks' Lambda), Ra's F-approximation (Rao's R) and level of significance(Q)

Presented results of multivariate analysis of variance between boys and girls in table 5 indicate that it is presented statistically significant intergroup differences in morphological characteristics as WILK'S LAMBDA is .174, which Ra's F-approximation of 5:54 gives a significant difference in the level of Q = .000. Thus, in the applied system of morphological characteristics of the respondents, statistically significant differences were found.

Table 6 Univariate analysis of variance analysis of morphological characteristics of boys and girls

Tests	Means (Boys)	Means (irls	F-relato\ion	Q
AVIS	154.43	155.97	1.55	.146
ATEZ	44.26	45.54	1.42	.104
AOND	21.84	22.25	1.55	.154
AKND	9.52	13.63	5.24	**.005**

Explanation: the arithmetic mean of the experimental group (Mean (e)), the arithmetic mean of the control group (Mean (k)), the value of F-test (F-ratio) and significance level (Q)

Table 6 shows the univariate analysis of variance measures morphological characteristics by comparing the results of arithmetic means of boys and girls. Based on the coefficients of F-relations and their significance (P-Level) can be concluded that the significant differences of the morphological characteristics appeared between boys and girls in skin folds of the upper arm (ACND .005) in the favor of the girls.

Table 7 Multivariate analysis of motoric capabilities variance between boys and girls

Wilks' Lambda	Rao's R	Q
.158	7.21	**.000**

Explanation : Values Bertletov's test (Wilks' Lambda), Ra's F-approximation (Rao's R) and level ofsignificance (Q)

Table 7 shows the results of multivariate analysis of variance between boys and girls which indicate that the statistically significant intergroup differences are presented in motor abilities as WILK'S LAMBDA is .158, which Ra's F-approximation of 7:21 gives a significant difference in the level of Q = .000. Thus, in the applied system of motor abilities were found statistically significant differences.

Table 8 Univariate analysis of motor skills variance between boys and girls

Tests	Means (Boys)	Means (Girls)	F-relation	Q
MTAP	35.64	34.24	1.72	.158
MD30	18.27	12.85	5.55	**.004**
MDPK	32.53	39.83	5.42	**.003**
MSDM	160.54	147.62	8.45	**.000**

Explanation: the arithmetic mean of the experimental group (Mean (e)), the arithmetic mean of the control group (Mean (k)), the value of F-test (F-ratio) and significance level (Q)

Table 8 shows the univariate analysis of variance tests of motor skills by comparing the results of arithmetic means boys and girls. Based on the coefficients of F-relations and their significance (P-Level) can be concluded that the statistically significant level of difference

between boys and girls is visible in the following motor tests: in lifting troops for 30 seconds (MD30 .004) in favor of boys, in deep forward bend on the bench (MDPK .003) in the favor of girls and long jump from the stand point (MSDM .000) in favor of boys.

4 DISCUSSION

Although the results of this study have a special importance in the planning and programming process of transformation as indicators of the initial status of the students, the significance of recorded differences between the sexes cannot be generalized to the entire population of sixth grade students in East Sarajevo.

The results may be a consequence of other factors that were not the subject of this study, because children in the fifth grade have very different physical prior knowledge that can greatly affect the development of their motor skills.

Noted differences in motor status between boys and girls are necessary to consider the formation of homogeneous groups in the classroom. On the one hand, in order to develop the segment speed and explosive power, boys and girls can not be in the same homogeneous group,but on the other hand to develop explosive strength and flexibility they can be in the same homogeneous but only in the fifth grade to the studied population.

This research confirms the need for diagnosis and analysis of the initial state of some anthropological characteristics at the beginning of the school year in order to improve the quality of regular and additional physical education classes . Base for planning and programming is realized according to individualized abilities and characteristics of the respondents.

5 Conclusion

Research to determine the differences between sixth grade male and female students of Primary School in some features of the anthropometric and motor skills was conducted with the aim of improving the quality of regular and additional physical education classes. It was done so that the planning and programming of the teaching process for the development of anthropological characteristics were consistent with the established gender differences among students.

The results of this study can not be generalized to a wider population of boys and girls at the age of twelve years because of the sample size and influence of various factors on the development of morphological and motor abilities. The results of this study can serve as a good guideline in order to better determine the homogenized group of Elementary Schools in the regular and additional physical education.

Generalization of the results obtained in this study should be based on research on a wider scale. Therefore, the conclusion of the younger students in other regions is not possible because the phase of rapid maturation certainly affect the difference between the sexes in relation to anthropometric characteristics and motor abilities.

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