DIFFERENCES IN PART OF ANTROPHOLOGICAL STATUS OF PRIMARY SCHOOL MALE STUDENTS IN CENTRAL AND PERIPHERAL CITY AREAS THAT INFLUENCE CHANGES IN PEDAGOGICAL APPROACH TO LESSONS

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Original scientific paper

ABSTRACT
This research was done to investigate differences of morphological and motoric status of primary school students in central and peripheral city area. This is a continuation of research that was done on female students of same age and same differences in living areas. Research sample is set on purpose and analyses morphological and motoric status of 115 primary school male students in city and suburban areas. There is a clear division in sub sample: 55 students from city area and 60 students from suburban areas. The age of students is between 14 and 15. This research did the analysis of 5 variables in morphological space and 8 variables of motoric space. Variables are in accordance to data evidenced by teachers at the beginning of the school year. After gathering the information, differences were determined by doing T-test for independent samples. T-test results were checked by calculating ***η2 values*** *(eta square for independent samples). After that, the aim of research was determined, that is "Differences of morphological and motoric status of primary school male students in central and peripheral city zone". We can emphasize less fat body in upper extremities, higher capability of keeping the balance and bigger strength in hand grip with students in suburban areas of living. Recommendation: research with same or similar variables should be done on different age categories of both sexes to determine consistency in differences of morphological and motoric status of students in urban and suburban areas.*
Key words: *Anthropological Status, Primary School, Euro fit Test Battery*

INTRODUCTION

This research is done as continuation of research made on female students of same age and same differences in living areas (Rašidagić & Imamović 2018). In the previous research, it is determined that female students aged 14 and 15 have differences in anthropological status. Statistical method used to check differences on univariate level is T-test for independent samples. When it comes to morphological differences, between students, they have been determined for triceps fat skin, subscapularis fat skin and Suprailiake fat skin. Motoric capability of female students was analyzed by EUROFIT battery tests used in lessons, five of them had statistically significant differences. Students who lived in peripheral areas had better developed balance (Flamingo test), higher speed of movement frequency (Hand Tapping Test), bigger explosive strength in lower extremities (Standing Broad Jump Test), bigger torso strength (Sit-and-reach Test) bigger functional strength of upper extremities (Bent Arm Hang). Given indicators are in accordance to research results done by **Pejčić & Co**. (1997). General conclusion of research is that living areas influence morphological and motoric characteristics of female students which is for example agreeable with results of research done by **Stanković and Hadžikadunić** (2005). In this research, authors support conclusions written by **Medanić and Pucan-Cvetković** in 2012. Conclusions are that general development of technology and higher standards cause that only small number of students walk to school, great number of students eats junk food, great number of students decreases physical activity and spends their time in front of computer or TV. Everything stated above causes the fall of physical activity. This research was used to verify if conclusions of previous investigations can be applied to students aged 14 and 15 who are in primary school and live in urban or suburban areas in Canton Sarajevo. With the stated arguments, the aim of this research is to determine "Differences in Morphological and Motoric Status of Primary School Students in Central and Peripheral City Area". With the right approach during the lessons (intensification, making individual groups, rational activities on class), we can increase students' movement and decrease the sitting way of life. It is necessary to plan and program lessons of physical education to achieve above mentioned effects (**Momirović, 1989, Starc & Strel, 2012).** There should be more different content to keep students motivated for physical education lessons. There are recognitions to this kind of approach and we can be sure this kind of activity of medium intensity has long term impact to health (**Mišogoj-Duraković et al, 1999**). The effect from the lessons is increased if principle of "unique impact" is applied in school physical education but also in other sport activities. In that way, different motoric activities can be planned and not repeated and there will be more different impacts to transform and develop anthropological status of children. Also, negative effects of sitting way of life can be decreased.

METHODS OF WORK

Examinee Sample

Research sample has its aim and analyses morphological and motoric status of 115 students in primary school who live in urban and suburban areas. In sub sample there is a division in two groups – 55 students from urban area and 60 students from suburban areas. Students are aged between 14 to 14 and 11 months. Examinees are not active members of sports clubs and they regularly attended physical education lessons during this research. During the research, there were no students who decreased their usual movement activities due to illness or injury.

Variable Samples

Data was collected by physical education teachers during the lessons. Parents' consent was requested to do measurements and tests as well as students' consent. Students were primarily introduced to procedures of measurement and tests as well as other specifications of this research. All procedures were done according to Helsinki Declaration. Variables of morphological status were gathered in the manner described by authors **Šoše & Rađo (1998.) and Mikić (1999),** variables for motoric capability were gathered in the manner described by author **Drljačić et al (2012).**

Variables to determine morphological status:

1. Variables to determine morphological status are gathered in usual manner with 3 measurements. Variables with medium value were taken in the process of analysis according to following: Height (VISS), Weight (MASS), Triceps Fat Tissue (PMTT), Biceps Fat Tissue (PMTB), Subscapularis Fat Tissue (PMTSS), Suprailiake Fat Tissue (PMTSI), Calf Fat Tissue (PMTL).
2. Variables to determine motoric capabilities belong to EUROFIT battery of tests. Since there are many different tests, we used the ones which are usual for physical education lessons in BiH: Flamingo (FLAM), Hand Tapping (TAPRUK), Sit-and-Reach (DOHSJED), Standing Broad Jump (SDALJ), Handgrip (SNASA), Sit-Ups (LEZSJED), Bent Arm Hang (IZDZGIB), 10x5 meter Shuttle Run (10x5).

Methods of Data Analysis

STATISTICA 12 program was used for data analysis. Testing the significance of differences was confired with T-test for independent samples. The significance of T-test has been set to ($P< .05$). The result significance was checked by calculating $\eta 2$ (eta square for independent samples, Cohen 1988) with values of collective variables:

- small coverage of variation .01 or 1%
- medium coverage of variation .06 or 6%
- high coverage of variation .13 or 13%

RESULTS

Table 1: Descriptive Statistics for Morphological Space – Boys, Group 1/ Group 2

Variable	Group	N	Mean	SD	Std Err
MASS	1	55	63.25	15.99	2.22
	2	60	57.19	12.98	1.54
PMTT	1	55	16.95	93.11	13.21
	2	60	9.72	52.31	9.99
PMTB	1	55	9.80	53.42	6.99
	2	60	5.54	31.33	5.51
PMTSS	1	55	25.83	125.99	16.77
	2	60	9.22	64.31	8.31
PMTSI	1	55	20.82	128.98	18.01
	2	60	10.33	77.65	9.01
PMTL	1	55	3.33	103.84	16.30
	2	60	1.15	61.21	8.73

Table 2: T-test for Morphological Space - Boys, Group 1/Group 2

Variable	F	Sig	t	df	Sig 2	η2	Mean	Std Error	95% Low	95% Upp
MASS	.33	.85	.907 .906	114 112	**.01** **.02**	.72	6.24 6.23	2.63 2.64	1.08 .996	11.40 11.39
PMTT	23.36	.00	5.35 5.16	114 103	**.00** **.00**	.01	39.54 37.36	13.32 13.65	45.35 44.21	98.52 93.35
PMTB	15.93	.00	5.01 4.85	114 113	**.00** **.00**	.00	39.56 34352	8.11 13.11	23.44 44.33	55.78 98.31
PMTSS	69.84	.00	9.15 8.79	114 88	**.00** **.00**	.41	160.1 159.3	17.48 18.32	125.33 121.33	194.33 193.33
PMTSI	37.76	.00	5.89 5.54	114 92	**.00** **.00**	.22	159.31 108.21	18.35 18.12	123.31 69.91	196.3 145.2
PMTL	39.37	.00	8.53 8.12	114 101	**.00** **.00**	.38	112.31 112.31	14.98 15.87	83.33 82.12	143.26 142.78

In the research results, there were less variables when compared to the number of tested and measured examinees. Variables that had higher descriptive difference between Mean values were taken to further analysis. Given results for morphological space are specified in Tables 1 and 2. Variables of morphological space that were taken to further procedure can be stated as following: Weight (MASS: 63.25/57.19), Triceps Fat Tissue (PMTT: 16.95/9.72), Biceps Fat Tissue (PMTB: 9.80/5.54), Subscapularis Fat Tissue (PMTSS: 9.15/8.79), Suprailiake Fat Tissue (PMTSI: 20.82/10.33), Calf Fat Tissue (PMTL: 3.33/1.15). T-test for independent samples was used to verify if there were any statistically significant differences between MEN values. T-test for independent samples is shown in Table 2 and statistically significant differences on P<0,05 level is confirmed (MASS; .01/.02, PMTT; .00/.00, PMTB; .00/.00, PMTSS; .00/.00, PMTSI; .00/.00, PMTL; .00/.00). After positive T-test, difference values of given results were checked when it comes to variant relations and calculated **η2 value** (eta square for independent samples). After calculating eta square for variables of Triceps Fat Tissue (PMTT .01) and Biceps Fat Tissue (PMTB .00) we can confirm those are significantly statistically different whereas other variables have shown great variant coverage within the groups.

Table 3: Descriptive Statistics for Motoric Space - Boys, Group 1/Group 2

Variable	Group	N	Mean	SD	Std Err
FLAMM	1 2	55 60	17.99 12.66	13.81 11.50	1.93 1.23
TAPRUK	1 2	55 60	11.84 11.46	1.54 1.79	0.21 0.18
SNASA	1 2	55 60	25.65 20.36	10.01 7.89	1.52 1.11
LEZSJED	1 2	55 60	25.82 21.18	4.91 2.31	0.85 0.29

Table 4: T-test for Motoric Space - Boys, Group 1/Group 2

Variable	F	Sig	t	df	Sig 2	η2	Mean	Std Error	95% Low	95% Upp
FLAM	5.11	0.14	2.32 1.10	114 111	**.02** **.02**	**.02**	4.99 4.31	2.32 2.12	.543 .413	8.91 8.03
TAPRUK	.591	.554	3.99 3.78	114 97	**.00** **.00**	.13	1.23 1.23	.29 .28	1.89 1.77	.821 .89
SNASA	1.97	.148	2.52 2.22	114 114	**.02** **.02**	**.04**	3.66 3.64	1.56 1.54	.54 .12	6.68 4.32
LEZSJED	1.01	0.78	4.99 4.32	114 113	**.00** **.00**	.16	3.32 3.31	.68 .66	2.31 2.30	4.33 4.01

Variables to determine motoric status are represented in tables 1 and 2. Statistical verification of difference significance was only made for variables that had higher difference between Mean value. Variables of motoric space that were taken for further procedure are stated as following: Capability to maintain balance (FLAM), Movement frequency speed (TAPRUK), Strength of handgrip (SNASA), strength of upper torso muscles (LEZSJED). Application of T-test for independent samples (Table 4). This test confirmed statistically significant difference on P<0,05 level with all four treated variables: (FLAM; .02/.02 TAPRUK; .00/.00 SNASA; .02/.02 LEZSJED; .00/.00). After positive T-test, value of result difference when it comes to variant relations was also checked and calculated η2 value (eta square for independent samples). After calculating eta square for only two variables: capability to maintain balance (FLAM η2 =.02) and handgrip strength (SNASA η2 =.04) there was significant difference in result variants and we can confirm they are statistically different while other variables of η2 value have shown great coverage of result variant within the groups.

DISCUSSION

Urbanization of all city areas had great impact to overall decrease of movement activity. Children have organized transport to school and to decrease their walking, school objects are built according to purpose and plan. Regardless of urbanization process, in the previously made researches, there is proof that female students who live in peripheral city areas are more developed in morphological and motoric status then girls from urban city areas (Rašidagić & Imamović 2018, Bavčević et al 2017).

Differences are seen in eight variables of anthropological status which is enough to conclude that children from urban areas have more sedentary way of life. Such differences have been noticed in other researches with similar subject. For example, authors Burgeson et al (2001) and Bowles (2012) claim that differences in anthropological status exist because in suburban areas there is more possibility to spend time outdoors and kids have higher motoric capability. Authors Cetinić and co. (2011) have similar thesis about male examinees and they investigated ten variables which have different anthropological status in urban and suburban areas. Authors Özdirenç and co. (2005) also investigated same subject within male examinees and their conclusion is that all variables of fat tissue skin are higher on boys from central city areas. Difference indicates conclusion these students have less movement activity and the consequence is more fat tissue mass. It is logically concluded that general body mass is bigger with urban city boys then the ones who live in the suburbs. This research has confirmed there is a difference between morphological and motoric status of boys from central city zones and boys from peripheral city zones. These differences within morphological space have been established for two variables of fat tissue mass: Triceps Fat Tissue (PMTT: η2 =.01) and Biceps Fat Tissue (PMTB: η2 =.00). Differences within motoric space are found within variables: Balance (FLAM η2 =.02) and Handgrip strength (SNASA η2 =.04). These conclusions took time to gather after first noticing great differences in Mean results of given variables. After that, the significance of these differences was checked with T-test for independent samples, and when T-test also had such differences, we verified size of coverage for variants that is calculating eta coefficient. When it was certain that eta coefficient was different, a conclusion was made that there was a meaningful difference in anthropological space between the groups. Explanation for this can be found in bigger manipulation / work on upper extremities of male examinees from peripheral living areas which lowers fat tissue in upper extremities. We can state that in peripheral city zones, students have better developed balance and stronger handgrip. Variable which defines strength of handgrip confirms morphological indicator of lower fat tissue mass within students who live in the suburbs and they also have higher level of upper extremities activity. Given results are partly confirmed through research done by Frederick and Ryan (1993). We can state the research achieved its goal and determined "Differences of Morphological and Motoric Status of Primary School Male Students Who Live in Urban and Suburban City Areas". To apply these results, it would be appropriate to make a survey about nutrition habits, investigate parents' physical abilities due to genetic factors which can be inherited. Similar was done by Maes et al (1997) and Safer et al (2007). There should be detailed check of students' sport activities outside of school to make these results as realistic as possible (Kondrić et al 2002).

CONCLUSION

Results of this research can be compared to results of different age categories to make more precise conclusions about antrophological status. Relations of morphological and motoric variables of researched groups could be more clear if the students in the process of research were to answer a survey about nutrition habits, their free time activities and their social status. Such information would give additional knowledge about determined differences of antrophological

status of researched population. For students in central zones, there should be more extra-curricular sport activities to decrease negative effects of hypokinesia.

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