

ARE RURAL CHILDREN REALLY IN BETTER SHAPE? CASE OF CROATIA

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ABSTRACT

Introduction: The aim of this research is to determine are there any differences at the level of motor skills of female students in the 8th grade by the rural-urban affiliation. **Materials and Methods:** The research was conducted at the sample of 1066 female students in the 8th grade in elementary school (average age 14,6, body height $164,67 \pm 6,46$; body weight $56,84 \pm 9,97$). 12 tests were used for assessment of coordination, agility, flexibility and repetitive strenght. **Results:** The results have shown that female students from urban and mixed environment achieve generally better results than their peers from rural environment. In most tests better results had achieved female students from meaningly urban environment, mainly in tests for assessment of coordination; PR ($p=0,00$), PT ($p=0,01$), flexibility, BFNLE ($p=0,00$) and repetitive strenght, LBLP ($p=0,04$), LBS ($p=0,04$). **Discussion and Conclusion:** Although former researches have shown that female students from urban environment hold lower level of kinantropology characteristics^{8,9,10,11,12}, it is to assume that induction of mechanization and lower need for physical work on farms, while maintaining the nutritional habits that involve tradicional, high calorie meals, also because of richer offer of organized sport events and programmes in the cities, they change mentioned state in benefit of female students from urban environment.

KEYWORDS

Urban-rural differences, pupils, 8th grade, Republic of Croatia

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AS CRIANÇAS DAS ALDEIAS TÊM A FORMA MELHOR DO QUE AS CRIANÇAS DA CIDADE? CASO EM CROÁCIA

RESUMO

Introdução: Objetivo dessa pesquisa é confirmar se existem as diferenças no nível da capacidade motora entre alunas de 8ª classe de acordo com afiliação rural ou urbana. **Materiais e métodos:** a pesquisa foi feita no exemplo de 1066 alunas de 8ª classe das escolas primárias (idade média 14,6, altura $164,67 \pm 6,46$, peso $56,84 \pm 9,97$). 12 testes para avaliação de coordenação, agilidade, flexibilidade e força repetitiva foram usados. **Resultados:** Os resultados mostraram que as alunas das áreas urbanas e das áreas misturadas conseguiram geralmente os melhores resultados do que as suas pares dos centros rurais. Na maioria dos testes os melhores resultados foram conseguidos pelas alunas dos centros extremamente urbanos, primeiramente nos testes de avaliação de coordenação; PR ($p=0,00$), PT ($p=0,01$), flexibilidade; BFNLE ($p=0,00$) e força repetitiva; LBLP ($p=0,04$), LBS ($p=0,04$). **Discussão e conclusão:** Embora as pesquisas presentes mostrem que as alunas dos centros urbanos possuem nível mais baixo das características quinantropológicas^{8,9,10,11,12} pode-se presumir que a implementação da mecanização e menor necessidade do trabalho físico nas propriedades rurais, com hábitos de alimentação incluindo as comidas tradicionais muito calóricas isso devido a grandes ofertas de eventos e programas desportivos organizadas nas cidades maiores, alteram o já mencionada forma das alunas das áreas urbanas.

PALAVRAS-CHAVES

As diferenças rural-urbanas, as alunas, 8ª classe, república Crócia

SON NIÑOS CON PUEBLO REALMENTE EN MEJOR FORMA FÍSICA? CASO EN CROACIA.

RESUMEN

Antecedentes: El objetivo de este estudio fue determinar si había diferencias en el nivel de las habilidades motoras de los estudiantes de octavo grado de la escuela primaria (edad media 14,6; altura del cuerpo 164.67 ± 6.46 , el peso corporal $56,84 \pm 9,97$). 12 pruebas se utilizaron para evaluar la coordinación, la agilidad, la flexibilidad y la fuerza dinámica. **Resultados:** Los resultados mostraron que los estudiantes de las zonas urbanas y mixtas se consiguen resultados en general mejor que sus pares de las zonas rurales. En la mayoría de las pruebas, los mejores resultados fueron logrados por los estudiantes de zonas muy urbanas, especialmente en las pruebas para la evaluación de la coordinación; PR ($p=0,00$), PT ($p=0,01$), la flexibilidad, BFNLE ($p=0,00$) y repetitivo el poder; LBLP ($p=0,04$), LBS ($p=0,04$). **Discusión y Conclusión:** Aunque los estudios anteriores han demostrado que los estudiantes de las zonas urbanas tienen niveles más bajos características de kinantropología^{8,9,10,11,12} suponer que la introducción de la mecanización y una menor necesidad de mano de obra física en la granja, mientras que conserva los hábitos alimenticios que incluyen tradicionales, alta en el más rico y ofrece comidas 13 organizado actividades deportivas y programas en las grandes ciudades, el cambio de la situación anterior a favor de los estudiantes de las zonas urbanas.

PALABRAS CLAVE

Diferencias urbano-rurales, estudiantes, 8 clase, Croacia.

INTRODUCTION

Ubiquitous industrialization, mechanization and robotics that brought us in the 21st century undoubtedly facilitates and raises the quality of life.

Satisfying human needs for society, affiliation and communication, is possible today from comfort of an armchair and however it may seem to us, newcomers in the digital world, unimaginable, today's children, „natives of digitizing“¹, do exactly that. Need for personal contact, socialization and motion vanishes in front of the Facebook, Twitter and rest of social networks and services.

That sedentary lifestyle affects the increase of body weight and obesity in childhood, as well as the lack of adoption of habits of regular physical activity. Physical activity is undoubtedly important factor in achieving optimal health status and also acts to reduce the risk of various diseases, as it is confirmed by many studies conducted around the world²⁻⁶. Therefore, it is obvious that the anomalous and inappropriate way of life and work conducted by one part of the youngest, reflects negatively on their health.

Many previous studies indicate that urban lifestyle is leading to greater inactivity and all worse kinan-

thropological characteristics of female students⁸⁻¹². It turned out that female students of urban areas spend most of their free time in activities like reading, playing computer games or watching TV⁷, while female students in rural areas, due to more spacious space environments, stay more in the open space that provides them freedom in movement and playing. This may lead to conclusion, which is confirmed by some researches, that female students of urban areas have lower levels of kinanthropological characteristics⁸⁻¹². However, it is to assume that the mentioned state changes in favor of female students of urban settlements because of induction of mechanization and less need for physical work on the farm, while retaining the nutritional habits that include traditional, high calorie meals¹³ and also because of richer offers of organized sport facilities and programs in the cities. Stated thought is confirmed by data from the European Union which consistently indicate that children in urban areas have greater size and mature earlier than their peers in rural areas¹⁴. The size advantage is attributed to the beneficial changes in public health and nutrition and, in general, to the living conditions associated with urbanization⁸. Hence, the size advantage commonly observed in urban children might also be reflected in the better levels of physical fitness.

The aim of this study was to determine whether there were differences in the level of motor skills of female students in 8th grade by the rural-urban affiliation.

MATERIALS AND METHODS

The study was approved by the Committee for the Scientific Work and Ethics of the Faculty of Kinesiology, University of Zagreb. This paper states the results of a larger study with the aim of validating tests and measurements for assessing kinanthropometric characteristics of school children in Croatia.

Subjects and variables

The study was conducted on a representative sample female student subpopulation in the 8th grade. The research includes some elementary schools from all Croatian counties. In each school was one class measured for the sample of examinees. Thereat, the sample of examinees in each school was made up of one eight grade. This had ensured a representative total sample of 1066 female students in 8th grade in elementary school (average age 14,6, body height $164,67 \pm 6,46$; body weight $56,84 \pm 9,97$).

The sample of variables is consisted of 12 tests of motor skills. Coordination was assessed by using three tests: a polygon reverse (PR), ball rolling by a non-dominate hand (ROLLING), polygon turn (PT). For assessment of agility three tests were conducted: side step agility (SIDE STEP), figure 8 with bending (F8), shuttle and run (SR). Flexibility was assessed by using three tests: bending forward with legs extension (BFLE), forward bend on a bench (BFB), forward bend in narrow legs extension (BFNLE). Three tests were carried out to estimate the dynamic strenght: lifting body from lying position (LBLP), lifting body-short (LBS), squats (SQ).

Each participant was measured in all variables and each variable is measured three times in succession or alternately, except of tests of dynamic strenght, which are measured once.

Note: A detailed description of measures and tests could be found in the doctoral thesis by Dario Novak¹⁵ (2010) under the title "Differences in kinanthropological characteristics of fifth grade elementary school pupils in relation to macro-regional and urban-rural characteristics of the Republic of Croatia" Faculty of Kinesiology, University of Zagreb.

Methodological explanations

An important assumption of analysis of differentiation between urban and rural areas of Republic of Croatia is conceptual definition and methodological separation of groups of urban and rural settlements as spatial demographic and statistical basis of this analysis. Based on data of the size of settlements and the share of agricultural population, the separation of urban settlements across Republic of Croatia in the period from 1953 till 2001 was made by N. Pokos¹⁶. Accordingly, in this study, the urban-rural area will be divided into three strata: settlements to 5000 inhabitants, settlements between 5000 and 10000 inhabitants and those in which there are more than 10000 inhabitants.

Statistical analysis

Data were analyzed using Statistica for Windows (data analysis software system), version 8.0., StatSoft, Inc. (2008). Descriptive statistics was used to present means and standard deviations for each variable. The Kolmogorov-Smirnov test was used for testing the normality of distribution before further analysis. The differences between the children's physical fitness profiles from urban and rural areas were determined using Anova. A series of t-tests for independent sam-

ples were made to compare additionally the subjects and thus establish any statistically significant differences between them. Statistical significance was set to $p < 0.05$.

RESULTS

Descriptive statistical parameters of tests for assessment of motor skills of female students in the 8th grade that are included in this study are presented in Table 1. After examining the value of the arithmetic mean of accomplished results of female students it is interesting to note that, taking into account the size of the settlements as a criterion, female students from urban and mixed areas generally had achieved better results than their peers from rural areas. In 7 from total 12 tests female students from urban areas (>1000 inhabitants) had achieved the best results. In the remaining 5 tests the best results were achieved by female students from the urban-rural areas (5000-10000 inhabitants).

Table 1 – Analysis of variance for all tested groups

Variables	Mean±SD			F	p
	< 5000	5000 – 10000	> 10000		
PR	14,67±3,54	14,59±3,68	13,31±3,17	17,930	0,00
ROLLING	20,41±2,95	20,26±3,39	20,50±3,65	0,303	0,74
PT	9,81±2,09	10,18±2,50	9,56±2,23	4,974	0,01
SIDE STEP	11,24±1,43	10,57±1,24	10,69±1,22	15,449	0,00
F8	10,33±1,25	9,88±1,18	10,21±1,45	4,639	0,01
SR	11,99±1,14	11,47±0,95	11,73±1,12	9,004	0,00
BFLE	63,26±13,23	64,72±12,88	65,74±12,31	2,841	0,06
BFB	46,26±10,35	47,81±7,46	46,24±8,32	1,816	0,16
BFNLE	50,18±10,04	49,61±8,63	52,27±10,12	5,839	0,00
LBLP	39,98±10,83	39,03±8,13	41,02±9,54	3,181	0,04
LBS	51,51±15,89	48,90±11,15	51,62±11,85	3,278	0,04
SQ	42,60±8,45	43,66±8,00	44,05±8,60	1,962	0,14

Results of univariate analysis of variance, also shown in Table 1, as well as the results of series of t-tests for independent samples, shown in Table 2, statistically significantly confirm the superiority of female students from the urban environment in the tests for assessment of coordination; PR ($p=0.00$), PT ($p=0.01$), while female students from the rural-urban areas achieved better results on the test for the evaluation of coordination of upper extremities (ROLLING), however, it was not found statistical significance of the results ($p=0.74$). Female students from urban areas are also

more flexible in the lower back and back of thigh; BFNLE ($p=0.00$) and have higher repetitive strength of front of the body; LBLP ($p=0.04$), LBS ($p=0.04$) while the repetitive leg strength, even though by arithmetic mean is better for female students from urban areas, is not significantly different by the area of living; SQ ($p=0.14$).

Table 2 – Results of series of t-tests for independent samples for all tested groups

Variables		< 5000	5000 – 10000	> 10000
PR	< 5000	–	0,83	0,00
	5000 – 10000	0,83	–	0,00
	> 10000	0,00	0,00	–
ROLLING	< 5000	–	0,68	0,76
	5000 – 10000	0,68	–	0,46
	> 10000	0,76	0,46	–
PT	< 5000	–	0,15	0,18
	5000 – 10000	0,15	–	0,00
	> 10000	0,18	0,00	–
SIDE STEP	< 5000	–	0,00	0,00
	5000 – 10000	0,00	–	0,29
	> 10000	0,00	0,29	–
F8	< 5000	–	0,00	0,28
	5000 – 10000	0,00	–	0,01
	> 10000	0,28	0,01	–
SR	< 5000	–	0,00	0,01
	5000 – 10000	0,00	–	0,01
	> 10000	0,01	0,01	–
BFLE	< 5000	–	0,33	0,02
	5000 – 10000	0,33	–	0,40
	> 10000	0,02	0,40	–
BFB	< 5000	–	0,15	0,98
	5000 – 10000	0,15	–	0,05
	> 10000	0,98	0,05	–
BFNLE	< 5000	–	0,60	0,01
	5000 – 10000	0,60	–	0,01
	> 10000	0,01	0,01	–
LBLP	< 5000	–	0,35	0,22
	5000 – 10000	0,35	–	0,01
	> 10000	0,22	0,01	–
LBS	< 5000	–	0,08	0,92
	5000 – 10000	0,08	–	0,01
	> 10000	0,92	0,01	–
SQ	< 5000	–	0,23	0,05
	5000 – 10000	0,23	–	0,60
	> 10000	0,05	0,60	–

Female students from urban-rural areas have better lateral and frontal agility what confirm the results of all conducted tests for assessment of agility; SIDE STEP ($p=0.00$), F8 ($p=0.01$), SR ($p=0.00$).

DISCUSSION AND CONCLUSION

The results suggest a statistically significant difference between female students considering urban-rural affiliation. Better motor profile of female students from urban areas is also noticed. However, the resulting statistical significance should be observed also through the prism of the large sample used in this study, which made it easier to achieve statistical significance. Data on something better motor status of female students in 8th grade from urban areas of Republic of Croatia are completely different from similar studies in the country and world that have been regularly indicating to a better and more quality motor potential of students of rural areas^{8-12,17} which in this study show weaker results in tests for assessing motor skills compared to female students from mixed and urban areas of Republic of Croatia.

Numerous environmental factors encourage regular physical exercise, such as family and friends who can encourage and support to exercise. Interest in sports activities among young people has a social dimension that is on the one hand determined by family environment and on the other side by the school system and offer of sports facilities. Engaging in physical activity, regardless of the source of incentives, for the young people it has an important function of socialization. Environmental conditions, however, may indicate a significant barrier to participation in physical exercise, such as unfavourable meteorological conditions, space for free play or exercise or lack of cycling paths¹⁸. The availability of sports facilities and informing the population, regardless of the rural-urban differences have important implications in the general level of engagement in physical activity, and hence the development of motor abilities and skills.

Although the population in the Croatian rural areas has more space and possibilities for physical activity, the fact that the accelerated way of life often disables the time that is for the modern man needed for the elements that ameliorate the overall anthropological status. The consequence of modernization and urbanization are increasingly affecting the rural areas, and nowadays it is not surprising that female students from these areas spend more and more time at home, watching TV and playing computer games. All this leads to reduced levels of physical exercise and thus falling of results of their kinanthropological characteristics.

According to some studies worse kinanthropological status may be explained by the induction of mechanization and less need for physical work on the farm, while retaining the nutritional habits that include traditional, high calorie meals¹³. Unhealthy eating habits, overweight and differences in the availability of certain sports facilities in relation to rural-urban affiliation may be important factors of influence to declining levels of physical activity and the development of motor abilities of children.

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