

RELATIONSHIP OF THE SOMATIC PARAMETERS BETWEEN BODYWEIGHT AND HEIGHT IN THE PRIMARY CYCLE STUDENTS

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Abstract

This paper shows the relationship of the somatic parameters between the bodyweight and the height of the primary cycle students. For this purpose, an ascertaining study was conducted within 4 school institutions in Bucharest, Târgoviște and Timișoara. The research involved the primary cycle students: a number of 346 subjects aged from 6 to 10 years (177 girls and 169 boys) were measured. The anthropometry was used as a working method and the data obtained were statistically processed and represented graphically. The results of the study highlighted a continuous increase in height and weight in both sexes within the researched age range. The proportionality of the somatic indicators (especially between the body weight indicators and the body height ones) was analyzed. Thus the harmony of the somatic indicators represents the main objective in the correct and harmonious physical development at the level of primary education. The use of the anthropometric method helps in defining the normal and abnormal forms, determining the constitutional types and specifying the changes obtained through sport. In this sense, the level of physical development was established in relation to age and sex, compared to the provisions of the National School System of Evaluation. The study focused on the monitoring of the development under the influence of the systematic practice of physical exercises, orientation of the students with good physical development towards the most appropriate sports branch (criterion of selection) and assessment of the physiological age related to the physical development level.

Keywords: *physical education, evaluation, anthropometry, somatic development*

1. Introduction

Throughout their existence, the human beings have faced problems in quantifying the parameters of the activities they carried out, so each field has developed a process of scientific or empirical evaluation, in education inclusively and, implicitly, in the field of Physical Education and Sports, an important component of the general education (Acsinte, M. (2018; Badiu, T., et al. 1999; Carp, I. 2000; Kuznecov V.S., Kolodnickij G.A. 2003).

This paper presents the methods of somatic evaluation in primary education and not only. The anthropometric examination regarding the growth and harmonious development of the young schoolchildren is a fundamental action in Physical Education and Sports because these measurements help to analyze whether the subject falls within normal limits, exceeds or is below the level of development specific to gender and age (Carp, I., Cozmei, G., 2013; Guțul, A., 2001).

Knowing the somatic and morpho-functional parameters allows to quantification of the work efficiency of both the teacher and the subject. The

measurements performed periodically, by stages of at the beginning and the end of some activities, show the variations in the evolution of each subject, highlighting the dynamics of the processes of growth and physical development (Urichianu, B., 2016, 2020; Piskunova, E.V., 2003; Meijer, A. et al., 2020).

2. Material and method

This paper is meant to highlight the relationship of the somatic parameters between body weight, height and body mass index in the primary school students.

In this sense, an ascertaining study was organized in 4 school institutions of Bucharest, Târgoviște and Timișoara. The research focused on the primary school students; a number of 346 subjects with ages ranging from 6 to 10 years (177 girls and 169 boys). Anthropometry was used as working method and the data obtained were statistically processed and represented graphically.

3. Results and Discussions

Based on the anthropometric measurements regarding the values of height, body weight and body mass index, the level of physical development, especially the somatic one, was identified in the ascertaining research. The data of the anthropometric ascertaining test are presented in table 1 and figures 1, 2 and 3.

Table 1 *Data of somatic development in the primary school students(n = 346)*

Grades	Gender	N	Parameters	X	+ m	S	Cv (%)
Preparatory grade	Girls	37	Height (cm)	125.29	1.15	7.01	5.59
			Weight (kg)	21.74	0.83	5.04	23.20
			BMI (units)	13.71	0.35	2.11	15.36
	Boys	30	Height (cm)	127.53	1.54	8.45	6.63
			Weight (kg)	23.53	0.94	5.12	21.77
			BMI (units)	14.33	0.36	1.95	13.61
The 1 st grade	Girls	30	Height (cm)	128.17	1.40	7.67	5.98
			Weight (kg)	26.32	1.12	6.14	23.32
			BMI (units)	15.88	0.47	2.57	16.18
	Boys	25	Height (cm)	133.6	1.39	6.99	5.23
			Weight (kg)	30.28	1.29	6.49	21.43
			BMI (units)	16.89	0.57	2.84	16.82
The 2 nd grade	Girls	31	Height (cm)	128.90	1.40	7.79	6.05
			Weight (kg)	28.74	1.19	6.67	23.20
			BMI (units)	17.14	0.52	2.89	16.90
	Boys	34	Height (cm)	130.00	1.48	8.60	6.62
			Weight (kg)	29.32	0.97	5.63	19.21
			BMI (units)	17.32	0.47	2.72	15.73
The 3 rd grade	Girls	36	Height (cm)	128.28	1.16	6.95	5.42
			Weight (kg)	29.47	0.91	5.44	18.45
			BMI (units)	17.83	0.37	2.19	12.30
	Boys	34	Height (cm)	131.62	1.15	6.72	5.11
			Weight (kg)	32.21	1.23	7.19	22.35
			BMI (units)	18.42	0.48	2.81	15.26

The 4 th grade	Girls	43	Height (cm)	139.49	0.94	6.15	4.41
			Weight (kg)	33.49	0.97	6.34	18.94
			BMI (units)	17.12	0.39	2.57	15.03
	Boys	46	Height (cm)	140.52	0.81	5.46	3.89
			Weight (kg)	36.17	0.89	6.09	16.86
			BMI (units)	18.20	0.29	2.01	11.04

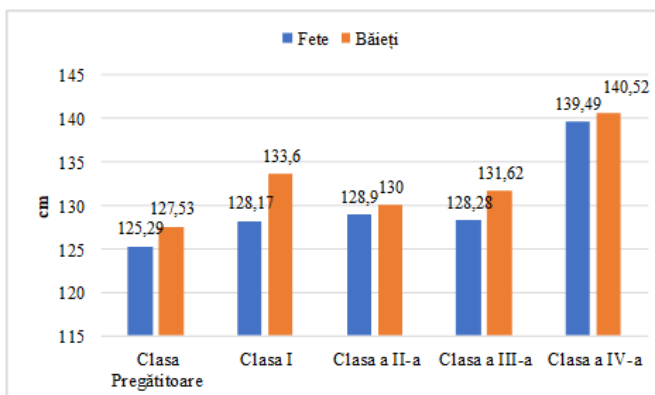


Fig.1. *Height of primary school students*

In terms of differences in the averages between grades for girls and boys, it is observed that: between the preparatory grades and the 1st grade there are increases in girls by 2.88 cm and in boys by 6.07 cm; between the 1st and the 2nd grade, there is an increase by 0.73 cm in girls, while the boys have a decrease by 3.6 cm; between the 2nd and the 3rd grade, the girls have a decrease by 0.62 cm and the boys an increase by 1.62 cm; between the 3rd and the 4th grade there are increases in girls by 11.21 cm and in boys by 8.9 cm.

These differences highlight the individual particularities of students' age between girls and boys and between grades.

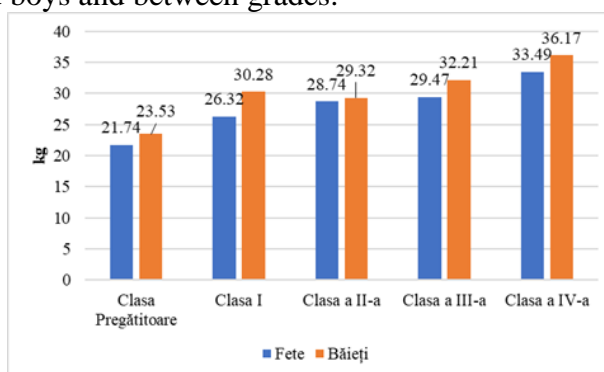


Fig. 2. *Weight of the primary school students*

Figure 2 shows the weight of the students in the preparatory grades and the primary cycle, comparing the girls' weight with the boys' weight. It is also shown the evolution between grades, in both girls and boys. The differences between averages in girls and boys are larger in the boys of all grades, namely: in the

preparatory grade there is a difference of 1.79 kg, in the 1st grade of 3.96 kg, in the 2nd grade of 0.58 kg, in the 3rd grade of 2.74 kg and in the 4th grade of 2.68 kg.

Regarding the differences of the averages of students’ body weight between grades, in girls and in boys, one can notice: between the preparatory grades and the 1st grade, there are increases in girls by 4.58 kg and in boys by 6.75 kg; between the 1st and 2nd grade there is an increase by 2.42 kg in girls and a decrease by 0.96 kg in boys; between the 2nd and the 3rd grade, there are increases by 0.73 kg in girls and by 2.89 kg in boys; between the 3rd and the 4th grade, there are increases by 4.02 kg on girls and by 8.9 cm in boys.

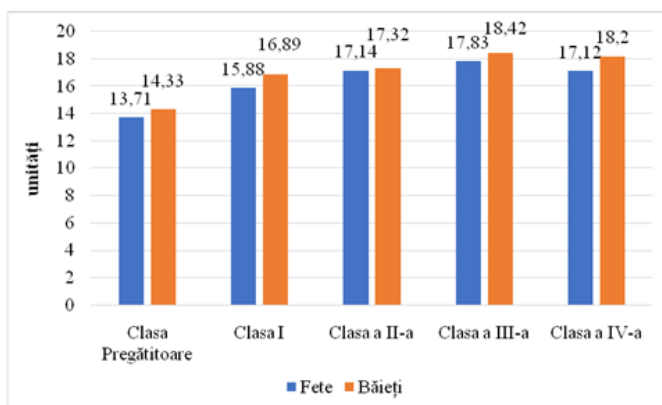


Fig. 3. *Body mass index in the students of primary school*

Figure 3 presents the body mass index of the students in preparatory grades and the primary cycle, where this index is observed comparatively between girls and boys and, respectively, the evolution between grades, in girls and boys as well. The differences between averages in girls and boys are larger in the boys of all grades, namely: in the preparatory grade, the difference is 0.62 kg/m², in the 1st grade there is a difference of 1.01 kg/m², in the 2nd grade of 0.18 kg/m², in the 3rd grade of 0.59 kg/m² and in 4th grade of 1.08 kg/m².

In the opinion of the authors (Acsinte, M., 2018; Badiu, T., Ciorba, C., Badiu, G., 1999; Carp, I., 2000; Lupu, E., 2012; Mereuță, C., 2008; Rață, G., Rață, G., 2008; Bal'sevich, V., 2004; Krucevich T., 2003; Kuznecov V.S., Kolodnickij G.A., 2003; Matveev, L., 2005, 2008; Holodov, Zh., Kuznecov, V., 2011), physical education is considered an absolutely necessary component of education, which facilitates the growth and harmonious physical development, the strengthening of health, the acquisition of basic motor skills and physical qualities (strength, speed, coordination, endurance, suppleness, mobility, flexibility etc.), qualities needed to carry out the daily activities.

It should be noted that, in addition to these aspects, a number of authors (Antonie, I., 2015; Urichianu, B., 2016, 2020; Piskunova, E.V., 2003) mention the contribution of physical education to the optimal education of the intellectual functions of children’s personality. The normal growth and development of the children are determined by the favorable social and environmental conditions,

which ensure an optimal physical and mental status and an ability to adapt to the conditions of their environment (Albu, E., 2007; Allport, G., 1991; Guțul, A., 2001; Vilenskaija, 2006). There are also approached subjects like the motricity in small school age (Acsinte, A., Miron, A. 2008; Badiu, T., 2008;); motor training of the primary school students (Ciorbă, C., 2015; Ghețiu, A., Demcenco, P., 2018); *physical fitness and health status in primary school students* - Ghețiu, A. 2017; Kashuba, V. et al. 2018; Kolimechkov, S. et al. 2013; Kriemler, S. et al. 2010; Meijer, A. et al. 2020.

4. Conclusions

The evaluation of the level of physical development in the students of the preparatory and primary grades highlights that the growth and development of children is one of the important problems with a special theoretical and practical significance.

The results of the anthropometric studies give an idea not only about the rate of development of body parameters. However, it should be noted that, at the current stage, there is a greater tendency for children to gain weight.

On the basis of the anthropometric measurements concerning the values of height, body weight and body mass index, the level of physical development, especially the somatic one, was identified in the ascertaining study. These differences show the individual particularities of students' age both between girls and boys and between grades.

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