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ANALYSIS OF CHARACTERISTICS OF DEVELOPMENT OF PHYSICAL QUALITIES OF STUDENTS OF HIGHER EDUCATIONAL INSTITUTIONS

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Annotation
This article provides a comparative analysis of each physical development indicator of 17-19 year old and 19-20 year old students studying in pedagogical higher education institutions and describes in detail the changes in them.

Keywords: indicators, growth rate, coefficient of variation, experiments, analysis, physical education, health.

Anmerkung
Dieser Artikel bietet eine vergleichende Analyse der einzelnen körperlichen Entwicklungsindikatoren von 17-19-jährigen und 19-20-jährigen Studierenden, die an pädagogischen Hochschulen studieren, und beschreibt detailliert deren Veränderungen.

Schlüsselwörter: Indikatoren, Wachstumsrate, Variationskoeffizient, Experimente, Analysen, Sportunterricht, Gesundheit.

Introduction

Globally, at present, physical education as a subject of study is one of the factors in solving various situations of modern development of students. It is aimed at harmonizing the potential of the human body and psyche, ensuring the formation of complete physical and mental health in students and achieving the required level of functional capacity, general physical fitness, high working capacity. To this end, a number of differentiated rotational training methods are used in the practice of physical training of children and young people on the basis of scientific work to address common problems related to identifying ways to increase the role of physical education in the global education system [1,2,3,4,5,6,7,8,9,10].

There are some components of innovative educational technologies in the educational process of leading foreign countries, ie the organization of the educational process taking into account the different levels of preparation of students and the development of accounting and control of learning outcomes. The issues of physical development and conditioning of stratification of physical qualities of students of

higher education institutions were studied. Along with attempts to comprehensively address the problem of stratification of the educational process in physical education, programs of various complexity are emerging[11,12,13,14,15,16,21,22,23,24,25].

During the years of independence in Uzbekistan, the development and promotion of physical culture and sports has risen to the level of state policy. At the same time, "we should not limit ourselves to the achievements in the field of higher sports, but pay more attention to mass sports." Therefore, the urgency of the problem is to involve students in physical education and sports. The need to develop research on the organization of the educational process in physical education in higher education on the basis of innovative approaches remains relevant[32].

Pedagogical analysis of physical fitness of students of higher education institutions, which describes the organization and implementation of physical education, the study identified students of different constitutional types of development by determining the state of physical development and physical fitness, and through them changes in interest in physical education[17,18,19,20].

Analysis of anthropometric descriptions of students revealed that most of the indicators studied were growing unreliably, which is the basis for assuming that the traditional physical education system was ineffective. For example, the analysis of the body length of students showed a significant change in their individuality. the body length of the girls was 163.5 ± 0.16 cm, the confidence level varied to t-1.92.

When the lengths of the arms and legs were analyzed, these figures were 61.4 ± 0.16 and 71.6 ± 0.27 cm, respectively, in students aged 17–18 years. and in students aged 19-20 years - 62.4 ± 0.12 and 72.8 ± 0.15 cm. Shoulder length has a tradition of increasing, but the length of the shoulder area remained unchanged (r> 0.05). Girls aged 17–18 years had a shoulder area length of 22.1 ± 0.18 cm. 19-20 years of age - unreliable to 22.3 ± 0.19 cm (t = 0.76).

A similar pattern was observed when analyzing the number and length of the leg. We can see that the figures of thigh length have changed reliably by the age of 19-20 years, but the figures of the legs remain at the initial level (r <0.05). At the beginning of the study, the length of the thighs in girls aged 17-18 years was 35.5 ± 0.16 cm, and in 19-20 years - 36.3 ± 0.23 cm (t-1.74) (Table 1). see).

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Table 1 Descriptions of body length indicators of female students

№	Indicators	17-18 young (n=81)			19-20 young (n=80)				p
		$\bar{X}$	σ	V%	$\bar{X}$	σ	V%	t	
1	Body length, cm	162,4	2,2	13,5	163,5	1,5	9,03	1,92	>0,05
2	Length of arms, cm	61,4	1,4	23,8	62,4	1,1	18,2	1,63	>0,05
3	Leg length, cm	71,6	2,4	13,4	72,8	1,3	18,2	2,1	<0,05
4	Shoulder length, cm	26,5	2,1	7,7	27,1	1,7	6,1	2,2	<0,05
5	Length of shoulder area, cm	22,1	1,6	7,4	22,3	1,7	7,7	0,76	>0,05
6	Length of number, cm	35,5	1,4	4,1	36,3	2,04	5,5	1,74	>0,05
7	Leg length, cm	32,5	2,2	3,7	32,6	2,4	7,2	0,34	>0,05

When these data were analyzed in boys, it was found that they also had changes during the study period, but these changes were unreliable on some indicators (r> 0.05). Boys have a tradition of increasing body length by the age of 19-20 years (r> 0.05): at the age of 17-18 years these figures are 169.6 ± 0.28 cm, and at the age of 19-20 years - 170.7 ± 0.38. cm. The length of their arms and legs was 70.6 ± 0.30 and 84.7 ± 0.27 cm at the age of 17-18 years, respectively, and 71.4 ± 0.28 and 85.4 ± 0 at the age of 19-20 years. , 25 cm.

There were no changes in both shoulder length and shoulder length in boys during the study period (r> 0.05) compared to girls. For example, at the age of 17-18 years, the shoulder length was 31.1 ± 0.35 cm and the length of the shoulder area was 25.5 ± 0.17 cm, and at the age of 19-20 years, respectively - 31.9 ± Increased to 0.25 and 26.3 ± 0.37 cm.

The same tradition applies to the assessment of hip length and leg length: in boys aged 17-18 years, hip length is 39.6 ± 0.28 cm, leg length is 35.9 ± 0.26 cm, in boys aged 19-20. and 40.7 ± 0.47 and 36.7 ± 0.28 cm, respectively (see Table 2).

Table 2 Descriptions of body length indicators in boys

T/p	Indicators	17-18 young (n=81)			19-20 young (n=80)				p
		$\bar{X}$	σ	V%	$\bar{X}$	σ	V%	t	
1.	Body length, cm	169,6	2,5	1,5	170,7	2,5	1,5	2,01	<0,05
2.	Length of arms, cm	70,6	2,7	3,9	71,4	2,5	3,5	1,5	>0,05
3.	Leg length, cm	84,7	2,5	2,9	85,4	2,3	2,7	1,6	>0,05
4.	Shoulder length, cm	31,1	2,3	7,3	31,9	2,3	6,9	1,04	>0,05
5.	Length of shoulder area, cm	25,5	2,4	9,6	26,3	2,5	9,3	1,1	>0,05
6.	Length of number, cm	39,6	2,5	6,4	40,7	2,5	6,2	2,8	<0,01
7.	Leg length, cm	35,9	2,3	6,5	36,7	2,5	6,74	1,7	>0,05

Body mass characteristics, total fat mass, muscle mass, and bone mass ratios are indicative of the rate at which students develop body composition. It has been found

that both girls and boys have a tradition of increasing total fat mass and decreasing bone mass by the age of 19-20 years.

When comparing body mass index, it can be stated that they increase reliably by the age of 19-20 years. The average body weight of girls aged 17-18 years was 54.3 ± 0.24 kg, and those aged 19-20 years - 55.2 ± 0.33 kg. At the same time, the coefficient of variation was 4.0 and 4.9%, respectively, which indicates that most students are overweight.

To determine the mechanism of body weight gain, the indicators of total fat mass were of interest, which were reliably increased in students aged 19-20 years. For example, in 17-18-year-old girls the total fat mass was 10.02 ± 0.08 kg, and in 19-20-year-olds - 11.2 ± 0.34 kg, while only in 19-20-year-olds the coefficient of variation was 22. , An increase of up to 93%, indicating a tradition of an increase in total fat mass in most girls. The growth rate increased to the t-2.0 conditional mark[26,27,27,28,29,30,31].

Muscle mass (kg) increased unreliably by the age of 19-20 years. The average muscle mass in students aged 17-18 years was 31.3 ± 0.38 kg, and in students aged 19-20 years - 32.9 ± 0.33 kg. In female students aged 17–18 years, the coefficient of variation in muscle mass increased to 8.1%, indicating that total fat mass was not predominant. This can be explained by the low level of physical activity and physical fitness of students of pedagogical universities. When analyzing bone mass indicators, no reliable increase in this indicator was observed in female students by the age of 19-20 years. For example, at the age of 17-18 years the values of bone mass were 7.7 ± 0.29 kg, and at the age of 19-20 years - 8.1 ± 0.31 kg, the coefficient of variation was 24.2% (Table 3). see).

Boys' body mass index has a tradition similar to that of students, which increased reliably at the age of 19-20 years, ie 61.4 ± 0.30 kg at the age of 17-18 years, and 65.5 ± 0 at the age of 19-20 years. , 39 kg., The coefficient of variation was 4.39 and 4.0%, respectively, and these figures indicate the diversity of the contingent of boys participating in the test (see Table 3).

Table 3 Total fat, muscle and bone mass parameters of female students

T/p	Indicators	17-18 young (n=81)			19-20 young (n=80)				P
		$\bar{X}$	σ	V%	$\bar{X}$	σ	V%	t	
1.	Body length, cm	54,3	2,2	4,1	55,2	2,9	4,99	1,9	>0,05
2.	Length of arms, cm	10,02	0,76	7,6	11,2	3,03	22,9	2,0	<0,05
3.	Leg length, cm	19,8	1,2	6,1	20,3	2,99	13,4	1,93	>0,05
4.	Shoulder length, cm	31,3	2,5	8,1	32,9	2,98	9,2	1,7	>0,05
5.	Length of shoulder area, cm	20,3	3,05	15,02	18,9	3,04	16,1	2,01	<0,05
6.	Length of number, cm	7.7	2,7	24,8	8.1	2,8	24,2	1,01	>0,05
7.	Leg length, cm	9,6	3,15	22,8	10,1	3,3	23,2	1,0	>0,05

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Total fat mass values increased reliably by age 19–20 years (r> 0.05). At the beginning of the study period, this figure was 8.7 ± 0.17 kg, and at the end - 9.9 ± 0.16 kg. It should be noted that the rate of increase in total fat mass was t-1.9 conditional units in boys by the age of 19-20 years. Muscle mass was 22.1 ± 0.15 kg in boys aged 17-18 years and 23.8 ± 0.14 kg in boys aged 19-20 years. The coefficient of variation was 10.40% for the second year of study at a higher education institution.

Table 4 Total fat, muscle and bone mass parameters of boys

№	Indicators	17-18 ёш (n=81)			19-20 ёш (n=80)				P
		$\bar{X}$	σ	V%	$\bar{X}$	σ	V%	t	
	Body mass, kg	61,4	2,6	4,4	63,5	2,6	4,04	1,9	>0,05
	Total fat mass, kg	8,7	2,6	29,4	9,9	2,8	23,4	1,7	>0,05
	Gross fat mass,%	11,6	2,6	22,1	12,5	1,6	11,4	2,1	<0,05
	Muscle mass, kg	22,1	2,3	10,4	23,8	2,4	8,05	2,4	<0,05
	Muscle mass,%	52,4	2,6	5,04	53,1	2,2	4,01	1,2	>0,05
	Bone mass, kg	8,2	2,6	31,5	9.0	2,3	25,9	2,1	<0,05
	Bone mass,%	11,8	2,5	21,2	12,1	2,3	19,0	0,77	>0,05

Bone mass index was reliably increased in boys aged 19–20 years (r <0.05). This figure is 8.2 ± 0.38 kg in boys aged 17-18 years, and -9.0 ± 0.16 kg in boys aged 19-20 years, with a coefficient of variation of 31.5 and 25.9%, respectively. (see Table 4).

In general, students aged 17-18 studying at the Pedagogical University can be thought of as individuals with normal height, body mass and body mass, as well as advanced levels of fat, muscle and bone mass. Low values of the characteristics studied in the retandards were identified. By the age of 19-21, an increase in fat mass and a decrease in muscle mass have been found In our experiments, the body length of 19-20-year-old girls of the backward, normal and advanced type was 16.0 cm higher than that of the girls of the backward type, and 8.8 cm higher than that of the normal type. It was also found that the performance of girls belonging to the advanced type was much higher than that of girls of the other type.

For example, it was found to be 9.7 kg higher for girls of the backward type and 5.8 kg higher for girls of the normal type. In addition, in the circumference of the chest, the performance of 19-20-year-old girls of advanced type is similar to that of other types, ie: -3.4 cm wider than the lagging type, and 1.5 cm wider than the normal type. detected.

A similar tradition was observed when we analyzed the physical development indicators of 19–20-year-old boys by different types. This can be explained by the rapid increase in body mass of girls and boys at the age of 19-20 years due to the increase in fat mass, which indicates that the profitability of physical education classes in pedagogical higher education institutions is low.

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