Riabokon V.O.

ASSESSMENT OF THE HARMONY OF THE PHYSICAL DEVELOPMENT

OF CHILDREN 12-13 YEARS

An assessment of physical health and functional capacity of the cardiovascular system adolescents 12-13 years. The observed discrepancy in the age and anthropometric and physiometric indix, indicating reduced adaptive reserve capacity of adolescents and is a harbinger of predisease condution.

Keywords: somatic health index Rufie, harmonious development, hypokinesia.

One of the criteria of physical fitness and physical health, according to modern concepts, is the level of physical development and the degree of harmony [3, 6].

Physical development - the process of biological cells, tissues, organs and body in general. Externally, it is characterized as an increase in the size of the body of the child and change the functional activity of individual organs and systems [5].

Most available objective indicators of physical development is the physical size (length, weight, chest circumference), but to assess the physical development of the child should be taken into account somatoskopic and physiologic parameters (vital capacity, power brush, blood pressure). It is equally important to assess the physical health is to analyze the functional state of the cardiovascular system, which is the most reactive system of the body to process immediate and long-term adaptation in exercise of varying intensity [3, 5].

The combination dosed by age norms of physical activity with favorable domestic and social conditions promote the full and harmonious development of the child [6].

That is why the *aim* of this study is to identify the characteristics of physical health of adolescents 12-13 years of age.

For this purpose formed following *tasks:*

1. Assess the level of overall physical development of adolescents;
2. Assess the level of physical health of adolescents.

Purpose of the study - the level of physical health of adolescents.

Object of research - anthropometric and physiometric indicators of adolescents.

Materials and methods. In order to assess the physical development were examined 30 males aged 12-13 years secondary school №53 of Kherson, which belong to the second group of health.

These anthropometric indices were determined by measuring morphological parameters of the body according to anthropometric demands [1].

Along with anthropometric index were measured physiometric: compressive strength measured hand dynamometer, alternately squeezing the right and left hand (3 attempts for each hand), vital capacity was calculated based on a core exchange for Anthony and formula Venrath:

VC = basal metabolic rate (kkal/24 h) * 1.75,

where the basal metabolic rate is determined by the Harris-Benedict tables; 1.75 - rate for males aged 10-13 years.

Assessment of physical development of adolescents conducted by comparing the obtained values with somatic normative values scales of tsentyly. These scales are descriptions of frequency band division of fractions of varying characteristics, independent of the mathematical distribution. The norm is 25-75 Tsentilo (half of children of this age and sex), risk group - 3-10 and 90-97 Tsentilo, persons in need of further examination - the output values of the trait beyond 3 and 97 Tsentilo. Harmonious development is determined by the results of anthropometric measurements and by tsentylny corridors scale:

1). harmonious development with a lag of age standards (3-10 Tsentilo);
2). harmonious development according to age (25-75 Tsentilo);
3). the harmonious development of advance age (90-97 Tsentilo) [2].

Functional status of the CVS was assessed by the standard functional tests Rufiye.

Calculation of the index Rufiye carried out as follows:

Rufiye index = (4 • (1 + HR + HR 2 HR 3) - 200) / 10, where 1 HR - heart rate at rest, HR 2 - is the heart rate during the first 15 s after exercise, heart rate 3 - is the heart rate for the last 15 after 1st minute after exercise.

Blood pressure was measured method of the Korotkoff [4].
Results and discussion.

Analysis of anthropometric indicators among the studied individuals found that values of body length among adolescents 12 and 13 years was significantly different. Moreover, comparing the obtained values with standard in tsentylny scales, found that 100% of sixth graders and 90% of seventh graders obtained values are in the range of 3-10 Tsentilo indicating the height discrepancy pupils to age and is associated with the delay in growth of boys during puberty and is a normal physiological phenomenon, because the most intensive growth in body length is 13-15 years (**Table 1**). These performance values of body mass compared with normative indicate underweight relative to age and characterized by reduced growth delays adipose tissue, which can cause accelerated metabolism or poor nutrition.

Main anthropometric and physiometric parameters of adolescents 12-13 years

Table 1

| Parameters	6 class	7 class
Weight, кg	26±2,06	32,3±1,03*
Body-weight index, g/cm	20,9±0,00	20,62±0,63
Height, cm	125,4±2,09	135,8±2,83*
Power brush , кg	12,4±1,03	15,2±1,06*
Power index, %	47,68±1,24	47,68±1,24
Index of Rufie	6,64±0,74	7,84±0,48*
Systolic blood pressure , mm.Hg	96±2,9	104±4*
Diastilic blood pressure , mm.Hg	61,8±3,4	62±3
Heart rate,beats / min	86,8±1,56	86,4±1,8
Vital capacity of lung, ml	736,75±1,08	886,2±1,5
Life index ,%	28,42±0,28	27,88±0,66

Note: *- significance of differences between parameters 6 and 7 class at $p<0,05$.

Based on the analysis of individual values of weight and height was discovered that all adolescents 12-13 years received value ratio of weight to height is disharmony (**see Fig.1**), as evidenced by the low level of body - mass index.

The above indicates the predominance aged 12-13 years elongation processes of the body to increase the volume   settings.

Figure 1

Harmonious development of adolescents 12-13 years at an individual ratio of body weight and height
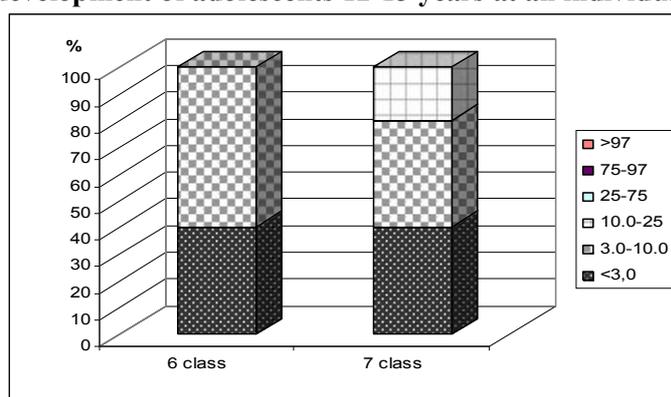
Analysis of the values of the circumference of the chest at tsentylny scales found in 100% of sixth graders and 90% of seventh graders narrowing of chest and disharmony development..

From 12 to 13 years is reliable increase basic anthropometric indicators: weight gain of 12.4% of body length to 92.3% of the chest circumference at 96.3%.

Comprehensive analysis of the anthropometric characteristics (weight, height, chest circumference) in tsentylny tables found that most of the obtained values are in the range (3-10 Tsentilo). Among students 6 and 7 classes dominated harmonious physical development with a lag of age standards, which met under the

100% and 80% of students and indicates the need for additional testing and medical monitoring for prevention of pathological conditions.

The harmonious physical development that meets the age regulations found only 20% of students in Grade 7.

Development of muscle strength in adolescents in terms of hand strength indicates low values of the power index, which is caused by the mass disharmony of age, respectively, and decreased muscle mass in puberty at 15-16%, which is the physiological norm (Table 1).

Values lung capacity and life index indicate uneven development of respiratory function in adolescents 12-13 years, due to a critical period of respiratory system functionality for a given age (the processes of growth and expansion of the bronchial tree, increasing the number of acinus and growth of lung tissue) is the physiological norm in puberty.

These average value of blood pressure among adolescents have the character of this period, however, 40% of Grade 6 pupils revealed elevated diastolic blood pressure, which is caused by the need to maintain optimal blood flow during rapid growth of the mass and length of the body during puberty. However, these children require medical supervision because elevated diastolic pressure may be a predictor of hypertension due to vegetative-vascular dystonia or dysfunction of the central nervous system imbalance regulation which occurs in puberty. The obtained values of heart rate at rest among the studied pupils of 6th and 7th grade did not differ (Table 1).

Evaluation Index Rufie showed that 60% of Grade 6 students gained an average level indicator, indicating normal somatic work and an adequate level of metabolic and cardiac muscle by high spare capacity of the cardiovascular system during exercise. Grade 7 students (80%) have received a satisfactory rate, and low and high values are absent altogether (**Fig. 2**).

Figure 2

Distribution of students by level of study Index Rufie
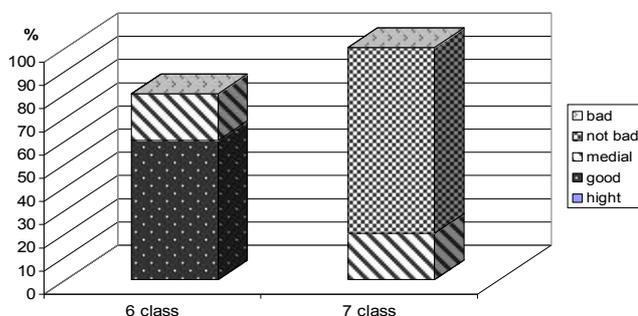
The trend towards a decrease in efficiency of the cardiovascular system from 12 to 13 years, with one hand may be due to physical inactivity, which prevails in the school life of teenagers, and the other morphological changes of heart and vascular elasticity, unbalanced autonomic regulation of functional systems due to enhanced activity of the endocrine glands and indicates the need for medical supervision.

Conclusions.

Assessment of key indicators of physical health found that the surveyed adolescents regardless of age there are low levels of physical health: pupils of 7 class in 80% and 40% of sixth graders. This points to the need for preventive measures to keep health in adolescence by streamlining the diet, training, and increasing the dosage of exercise.

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Annotation

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Evaluation of condition of physical health and functional capacity of the cardio-vascular system adolescents 12 to 13 years old. Revealed the discrepancy age of anthropometric and phisiometric indicators, which testifies to reducing adaptations capabilities of the organism adolescents and is the harbinger of before sensitive status.

Key words: somatic health, the index of Rufie, the harmonious development, hypokinesia.