



# Psychophysiological Training of Physical Culture Teachers and Coaches to Preserve the Mental Health of Teenagers

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## Abstract

The article reveals the main dimensions of the psychophysiological training of future physical education teachers and coaches in general secondary education institutions, sports clubs and children’s and youth sports schools to understand and take into account in the pedagogical work the peculiarities of adolescence, to create conditions for the formation of physical culture of children and adolescents with various acquired dysfunctions in wartime conditions. It is noted that the psychophysiological preparation of future physical education teachers and trainers determines the motives, content and direction of children’s motor activity, which is characterized by distinct tendencies towards individualization according to indicators of psychophysiological development and nosological units of chronic diseases. Attention is drawn to the general trend caused by the Russian Federation’s war against Ukraine, aimed at the destruction of the Ukrainian people and, first of all, its younger generations, which is the increase in the disability of children of all age groups. Related to this is the emergence of a general societal need for the training of future physical education teachers and coaches in general secondary education institutions, sports clubs and children’s and youth sports schools, capable of creating conditions for the formation of physical culture of children and adolescents who have lost limbs, have been traumatized, which led to persistent impairments of intelligence, locomotor apparatus, vision, hearing, speech or a combination of various dysfunctions acquired in wartime conditions.

**Keywords:** Adolescent Health; Individual Experiences; Vital Index; Morphofunctional Characteristics; Psychohygiene; Hemodynamics; Teachers’ Guidance; Motor Activity; Disability of Children; Dysfunctions Acquired in Wartime Conditions

## Specificity of Adolescence

Special attention needs to be paid to the preparation of future physical education teachers and trainers for work in general secondary education institutions, sports clubs and children’s and youth sports schools to understand and take into account the psychophysiological features of adolescence in pedagogical work. Adolescence largely covers the age development of middle school students, but at the same time goes beyond it. In this regard, in the research environment,

it is customary to single out the adolescent period in many professional areas and, in particular, when elucidating the specifics of the influence of physical culture and sports on the health of adolescents.

A pronounced specificity of adolescence is rapid growth unevenness, which leads to the emergence of peculiar individual experiences of both tall and short teenagers, related to their everyday comparisons of themselves with others. Separation of teenagers into growth groups corresponding

to their height softens the age-related experiences of peers and most often removes them from current consciousness completely.

An example of solving this problem is the study of functional development features of tall teenagers who play volleyball, conducted by Andriychuk YM, et al. [1]. The study revealed the features of the state of the cardiorespiratory system of tall schoolchildren aged 14-16 who played volleyball, compared to tall students who did not play in sports sections. The study was conducted in the form of an experiment, where 193 schoolchildren aged 14-16 were divided into two groups: the first group consisted of 75 people who were engaged in physical education according to the generally accepted program and did not attend sports sections; the second group consisted of 98 people who played volleyball in school sports sections.

As a result, it was established that high indicators of the vital capacity of the lungs in 15- and 16-year-old volleyball students are explained by a longer body length, and the vital index, in turn, is one of the indicators that informatively characterizes the state of the cardiorespiratory system. The life index of volleyball students compared to untrained teenagers was significantly lower at 14 years old ( $p < 0.001$ ) and almost did not differ from untrained ones at 15 and 16 years old. The maximum volume speed of the air flow on exhalation and inhalation characterizes the strength of the respiratory muscles, and their higher values in volleyball students at the age of 15 and 16 are explained by higher values of the vital capacity of the lungs.

The value of the obtained data lies in the fact that the research established: volleyball lessons according to the current program do not give the desired functional effect for the respiratory system of tall students-volleyball players, and therefore the school program needs to be revised taking into account the psychophysiological characteristics of this category of teenagers.

The study of the peculiarities of the morpho-functional characteristics of the cardiovascular system and the comparative analysis of trends in the growth processes of adolescents under the influence of physical education and sports on their state of health were updated by Karpyuk TO [2] in connection with the second sharp increase in the mass of the heart, which occurs at the age 13-14 years old. In this regard, the assessment of growth and development rates, their acceleration or deceleration compared to average population norms, needs to be taken into account in the organization and conduct of physical culture and sports classes. For this purpose, it is necessary to determine the ratio of indicators of biological and passport age at different stages of ontogenesis, excluding cases of exogenous stimulation or

delay of growth processes in adolescence.

### Preventive Role of Physical Culture

Lobutska KI, et al. [3] note a certain preventive role of measures to strengthen physical health, first of all physical education and sports, along with psychohygiene of the mental work of schoolchildren for the prevention of adolescent neuroses. Among the variety of neuroses of adolescence, researchers especially single out neuroses of fear, depressive, hysterical, asthenic (neurasthenia), hypochondriac neurosis, and neurotic sleep disorders.

Of particular interest is the study by Melnyk SA, et al. [4] features of adolescent hemodynamics during physical exertion, in particular, the values of peripheral resistance in precapillaries not only at rest, but also after physical exertion. After the examinees performed 20 squats, the value of peripheral resistance after the load in boys was  $69.13 \pm 2.29\%$ , and the decrease in this parameter ranged from  $64.50 \pm 16.45\%$  in 16-year-olds to  $75.18 \pm 1.69\%$  in 13-year-olds, i.e., with age, the value of peripheral resistance decreased to a greater extent during exercise, which indicates lower energy expenditure to overcome obstacles to the movement of blood through vessels (about better patency of the vascular bed). In addition, during the individual analysis of the obtained results, a changed reaction to the load in the form of a lack of reduction in peripheral resistance was found in 4.76% of boys.

Paradoxical (distorted) reaction of the arterial vessels of the large circulatory circle to the influence of physical exertion in the form of an increase in peripheral resistance was recorded in 2.38% of boys, and most cases of distorted reaction of peripheral resistance to physical exertion were recorded at the age of 13-14 years and 16 years. The patency of the arterial system in these conditions not only does not increase, but, on the contrary, decreases. This indicates the presence of a violation of the functional state of the circulatory system, which is manifested in an inadequate response to increased requirements.

In a generalized form, Trofimuk O, et al. [5] cite indicators of the formation of a caring attitude of adolescents to their own health in the form of the results of expert evaluations of future teachers of physical culture. The conditions of the study provide for the correlation of teachers' instructions and the motivational orientation of teenagers, which determined their care in their attitude to their own health. Expressed evaluative judgments regarding the specified motivational orientation of future teachers had the following ratio: military-patriotic education was preferred by 33.52%; increasing motivation for knowledge through physical culture and education of a patriot and citizen of Ukraine-29,

39%; increasing students' motivation for physical activity and a healthy lifestyle-18.68%; avoiding bad habits and improving physical qualities - 18.41%.

In order to determine the level of general physical fitness of female handball players aged 12-13, Melnyk M, et al. [6] testing of the manifestation of motor abilities was carried out according to the tests developed by Professor V.Ya. Ignatieva for specialized children's and youth schools of the Olympic reserve. The level of explosive power was determined using the "triple long jump from standing" test. The average indicators of the standing long jump of young handball players were  $428.5 \pm 16.7$  cm. The level of development of speed qualities was determined using the "30 m run" test. The average running time of 30 m in young handball players was  $5.4 \pm 0.8$  s. General endurance was studied using the "Cooper" test. Teenage girls ran an average distance of  $1500 \pm 84.6$  m in 12 minutes.

As a result of testing the coordination abilities of handball players based on the data of the "100 m shuttle run", the average result was  $28.0 \pm 1.4$  s. Handball players threw a ball weighing 1 kilogram with their right hand an average of  $9.4 \pm 2.2$  m, which proves the level of development of their strength: with the left hand, on average,  $6.7 \pm 1.6$  m; with two hands while sitting at  $5.4 \pm 0.9$  m. Based on the obtained data, the researchers concluded that the level of general physical fitness of teenage handball players participating in educational and training groups of the first year of study is below the average level - 318 points with an average norm - 350 points, that is, corresponds to 90.9% of the established standards.

### Promising Trends

Thus, the preparation of future physical education teachers and trainers to work in general secondary education institutions, sports clubs and children's or youth sports schools requires taking into account the specifics of the impact of physical education and sports on the health of children of different age groups. The psychophysiological preparation of future physical education teachers and coaches determines the motives, content and direction of children's motor activity, which is characterized by distinct tendencies towards individualization according to indicators of psychophysiological development and nosological units of chronic diseases.

The general trend caused by the Russian Federation's war against Ukraine, aimed at the destruction of the Ukrainian people and, above all, its younger generations, is the increase in the disability of children of all age groups. Related to this is the emergence of a general societal need for the training of future physical education teachers and trainers in general

secondary education institutions, sports clubs and children's and youth sports schools, capable of creating conditions for the formation of physical culture of children and adolescents who have lost limbs, suffered trauma, which led to persistent impairments of intelligence, locomotor apparatus, vision, hearing, speech or a combination of various dysfunctions acquired in wartime conditions.

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