

direction or amplitude of the movement does not correspond to the set motor task, then such movements are called imprecise.[5]

**Conclusions.** Thus, as the analysis of the special scientific and methodological literature in the field of physical education shows. Thus, as the analysis of the special scientific and methodological literature in the field of physical education indicates, our experiment shows a decrease in the level of physical activity of students under conditions of distance education. The results of the study showed that In order to ensure the development of this process in a certain appropriate direction, it is necessary to The systematic application of pedagogical management in the physical education of students of higher education institutions. The systematic application of pedagogical management in physical education of students of higher education institutions and improvement of modern methods and means of physical education, taking into account today's realities. It takes into account today's realities. Furthermore, it is important to increase motivation and interest in physical activity. It is also important to increase motivation and interest in physical activity.

An analysis of literary sources on the research of the above-mentioned topic was carried out and it was determined that the most important task of modern education is the upbringing of a healthy generation, the conscious attitude of the individual to his health and the health of others, the formation of physical, moral and mental health, the perceived need for physical improvement, development of interest and habit for independent physical education and sports, acquisition of knowledge and skills of a healthy lifestyle. The peculiarities of the implementation of health-preserving competence in physical education classes in higher education institutions are revealed. The main implementation problems and ways to solve them have been identified. It has been proven that health-preserving competence is one of the main factors in the process of physical education and the involvement of student youth in physical activity.

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#### FUNCTIONAL CONDITION OF YOUNG SWIMMERS. PSYCHOPHYSICAL INDIKATORS.

*In the problem of studying the implementation of complex motor reactions in conditions of sports activity and their tolerance, along with generally accepted psychological and pedagogical measures, the study of psychophysiological functions is used. The physiological mechanism for the implementation of complex motor functions in health and in pathology has been studied by many authors [1,2,3etc.], mainly in a state of rest. However, there are many controversial issues related to the influence of complex coordination loads, such as swimming, on the mechanisms of implementation of the contractile function in young athletes, even at the initial stages of training. Quantitative assessment of the state of the somatosensory system, which ensures the performance of a special motor function of young athletes, characteristic of a specific type of motor activity, consists in the insufficiency of methodological criteria.*

**Key words:** *problem, training, somatosensory, system, function, athletes.*

**Хіміч Ігор, Парахонько Вадим, Качалов Олександр. Психофізичні показники функціонального стану юних пловців.** У проблемі вивчення реалізації складних рухових реакцій в умовах спортивної діяльності та їх переносимості поряд із загальноприйнятими психолого-педагогічними заходами використовується вивчення психофізіологічних функцій. Фізіологічний механізм реалізації складно-рухових функцій у нормі та за патології вивчався багатьма авторами [1,2,3, та інших.] переважно у стані спокою. Однак існує багато спірних моментів, пов'язаних із впливом складно-координаційних навантажень, яким є плавання, на механізми реалізації скорочувальної функції у юних спортсменів навіть на початкових етапах навчання. Кількісна оцінка стану сомато-сенсорної системи, що забезпечує виконання спеціальної рухової функції молодих спортсменів, характерно конкретного типу рухової активності, полягає у недостатності методологічних

критеріїв. Фактором підвищення продуктивності плавання є адаптація та реадaptaція енергетичних і функціональних систем організму до стимулів фізичного та психічного напруження під час тренувань і змагань. Ефективність моніторингу підготовки юних плавців базується на точному визначенні змін специфічних адаптації. Оцінка та контроль біохімічних, психічних і моторних змін забезпечують знання особливостей адаптації організму на різних етапах тренування. Існує певна необхідність для аналізу і опрацювання інформації для вияву роботи цих механізмів. Використання інновацій таких як додаток для аналізу даних дослідження, який вимірює і аналізує обсяг тренувальних зусиль, що відстежується в макроциклі вимірюванням показників. Враховуються і опрацьовуються результати психологічного тестування, обсяг тренувальних засобів на зони зусиль на початку та в кінці дослідження. Результати біохімічних тестів під час тренувальних занять паралельно з виконанням рухових тестів. Динаміка метаболічних і гормональних біохімічних показників у змаганнях. Співвідношення змінних показників дослідження в навчанні. Кореляція змінних індукованого стресу в конкуренції. Всі ці механізми мають бути розкриті і вивчені для подальшого використання в тренувальному процесі навантаження яке буде підібрано оптимально для кожного пловця індивідуально і не буде мати негативного впливу на його функціональний і психічний стан.

**Ключові слова:** проблема, тренування, сомато-сенсорний, система, функція, спортсмени.

#### **Formulation of the problem.**

To study the features of psychophysiological reactions of young swimmers at the initial stages of learning to swim.

A complex coordination reaction, such as sports activity, carried out under conditions of, as a rule, maximum motor intensity, consists of a larger number of elements in the central nervous system and in the periphery, complementing each other. Thus, the implementation of a motor reaction in the same sport can be carried out with the dominance of other components of the motor reaction in each individual person, leading to the same result - covering the distance.

**Analysis of literary sources.** Domestic and international scientists are actively working on the issue of informatization of education: Aphasia A. [1], Bitko S., Tsiurnikov A. [2], Mendes Jr. [3], Toth M. [4], Wilmore J. [5].

**The purpose of the study is-** study of the speed of simple and complex motor reactions.

- study of the maximum speed of information processing and the mobility of nervous processes when performing motor reactions.

- study of the stability and reliability of information processing when working at submaximal speed.

- study of the excitation/inhibition balance at rest and at submaximal speed.

- study of the strength of nervous processes.

- study of resistance to fatigue during work of maximum intensity.

#### **Research methods:**

1. Obtaining express information about a person's psychophysiological states:

- determination of the level of spatiotemporal differentiation, the ratio of inhibitory-excitatory processes in the central nervous system.

- determination of the latent time of simple and complex visual-motor reactions.

- determination of the level of neuromuscular excitability, resistance to fatigue of the neuromuscular system, depth of fatigue and assessment of the simulated process of predominantly aerobic, anaerobic, and general endurance.

2. Analysis of results:

- assessment of the reliability of the obtained primary results.

- determination of model characteristics and reliable boundaries of the studied indicators by level of training.

- determination of the level of significance of various indicators.

#### **Presentation of the main study material.**

**Functional state of the athlete's body: approaches to definition and assessment issues.** According to a few researchers, the most important properties of states are variability and continuity [5]. According to various empirical data, any current state follows from a previous state, allowing assert the "continuity" of states. As for the "variability" of states, transition from one state to another, so far, the researchers have not been able to find out discreteness of states, such a pronounced quality that would separate one state from another, which, in turn, does not allow us to unambiguously determine one or another state of a specific person [1].

There are practically no "pure" states [3]. A state is a multidimensional phenomenon; therefore, scientists single out such state indicators as the most important: emotional (modal); tonic (reflect the tone, resource of the individual's forces); activation (reflecting the intensity of mental processes); temporary (reflecting the duration, stability of states); state polarity, etc. [2].

The concept of "functional state of a person" is one of the most uncertain. There are many definitions explaining this concept. This is due to many problems and methods of research in this field. From the point of view of the integrative approach in physiology, the functional state can be defined as:

1. Qualitatively peculiar response of functional systems of different levels to external and internal stimuli arising in the process of activity.

2. The ability to perform a specific type of activity considering the impact on human health.

3. The dynamic result of the interaction of various subsystems of the body.

4. An integral complex of those functions and characteristics that are directly or indirectly caused by the performance of activities.

5. Complex systemic response of the organism to activity, response of the organism to external and internal factors of activity.

The clearest is the definition of the "functional state" of a person as an integral complex of functions and characteristics of

a person, which are caused by the performance of activities. The main points in this definition are the integral character of the changes taking place, which have a direct connection with the dynamics of activity efficiency. Emphasizes that the concept of a functional state is introduced to characterize the effective side of a person's activity or behavior. It is about the capabilities of a person in this or that way condition, perform a certain type of activity [1].

Assessment of the functional state of the body during sports is important for the optimal construction of the educational and training process, the timely "exit" of athletes to a high level of physical fitness, which, along with other factors, ensures the achievement of the maximum possible sports result. Indeed, only in the case when the main physiological systems of the body reach the most optimal level of functioning, the optimal degree of coherence, we can talk about the possibility of an adequate response to physical loads of different volume and intensity. It has long been no secret that to achieve a high sports result, an athlete must be adequately prepared in physical, technical, psychological, tactical and, of course, functional [4].

A technically and tactically prepared athlete, starting his sports performance perfectly in running, swimming, sports games, etc., often abruptly "gives up" after a certain, in some cases, insignificant time, and his high technical and tactical level can no longer compensate significant lag other athletes. This fact has a completely scientific explanation - with insufficient functional preparation of an athlete, signs of natural fatigue accumulate very quickly in his body, inhibitory processes begin to prevail in the central nervous system, disrupting the optimal course of leading physiological systems [2]. Hence the manifestation of all unfavorable signs: increased heart rate, increased blood pressure, painful sensations, impaired coordination of movements, etc.

In the studies it is shown that for the body to optimally perform physical exercises, it must have a certain energy potential and be able to dispose of it very economically potential. Only in this case, the adaptation to loads will be optimal, and this or that athlete can achieve the required result. So, we can come to the disappointing conclusion that physical fitness and functional condition is an enabling condition for athletic success to realize all the elements of a person's sports preparation and there is a kind of base for the full implementation of all other factors. Analysis of numerous literary sources on the problem of physical fitness and functional state of athletes leads to the opinion that when evaluating of this parameter, it is important to determine not only the level of system functioning energy supply, but also have a clear idea of such indicators as power, capacity, measure. It is possible to have, for example, a high lactate capacity, but a low indicator of it uses, because of which a lactate capacity will be low and, therefore, sports results when performing speed and speed-power types of physical exercises. The problem of medico-biological control of the physical fitness and functional state of athletes has been solved, it is only necessary implement it practically with the appropriate adjustment of the educational and training process and expect high results, records, and medals from the athletes. But it is here, with all the clarity of the main points of diagnosis of physical fitness and functional state, that the main problems arise, most often associated with the practical definition of a specific functional indicator [5].

Thus, we define the "functional state of the athlete's body" as an integral characteristic of the state of health that reflects the level of functional reserve that can be used for adaptation that implements a specific muscle activity, body systems. Physiological assessment of one of the most important indicators of an athlete's fitness - functional state - must be comprehensive and consider the following criteria: anthropometry, cardiac optimality regulation, tolerance to physical exertion, the state of locomotor function and stability.

At the same time, the physiological assessment of an athlete's functional state should be integral, reflect the body's adaptive capabilities (functional reserve), be universal and be performed as far as possible without loads, and the functional control itself should be carried out in two stages: "training" - in the conditions of specialized centers, laboratories, sports halls and "competitive" - directly in the conditions of the competition.

The study of individual characteristics showed high accuracy and reproducibility in each specific case, which can be explained by the basic level of these reactions and the adequacy of the methodology. Individual characteristics have quite pronounced group levels, which in turn may reflect the selection in swimming of the most adapted because of competitive activity and individual adaptation to a specific type of motor activity.

Group data have a significant spread. However, this fact may not indicate heterogeneity of the group, but rather an approach to the physiological limits of the reaction time for this group, adapted to a specific type of energy supply for motor activity.

The research results allow us to note a higher degree of correlation between A simple visual-motor reaction and A complex visual-motor reaction according to the levels of training, which in turn reflects the degree of adaptation to the dominant type of motor activity of the central link of regulation. The study of correlations between simple and complex reactions does not have a linear relationship and indicates greater variability in the interrelations of the sensorimotor region of the cerebral cortex, which in turn may indicate heterogeneity in the implementation of complex motor reflexes in the sensorimotor region.

These results allow us to note that the high significance of the connections between specific sports activities and the characteristics of the energy supply of the central link in the regulation of motor activity has been determined.

The results of the analysis of functional mobility by level of training indicate that the static level of physical fitness, as a rule, is significantly lower than the dynamic one. These results are significantly different from those who do not engage in sports and indicate the metabolic influence of sports activity on the general tonic state of the brain.

Analysis of a set of indicators reflecting the functional mobility of nervous processes at the level of physical fitness indicates a significant intergroup difference in these indicators. A significant and, in many cases, reliable increase in the level of physical fitness indicates a change in the sense of time and speed of switching in the motor parts of the central nervous system that is specific to this sport. Evaluation of these research results allows us to identify several significant relationships between the characteristics of the mobility of nervous processes and the type of motor activity of athletes.

It is known that the structural modules of the sensorimotor cortex, when formed, have the prerequisites for interneuron integration [3]. The leading feature of the training process in this sport is the dominant interpenetration of dendrites of the subcortical vegetative sections into the posterior frontal region.

In trained swimmers, the correlation between complex visual-motor reactions is reliable and less reliable between other

indicators. Similar relationships are characteristic of the efferent connections of axons of the higher parts of the cortex (consciousness) with the motor and premotor parts. The presence of a pronounced correlation between complex visual-motor reactions and the level of physical fitness indicates a multisystem convergence between visual inputs to the motor area and higher parts of consciousness. Indeed, even in the works of showed the presence of similar, both functional and morphological connections.

If we consider that swimming lessons begin before the period of secondary axonal convergence, at 9-12 years old, then it is probable to assume differentiation of axons in the indicated direction under the influence of regular specific physical exercises.

Analysis of the results of the studied literature indicates a correlation trend between complex visual-motor reactions and the level of physical fitness. Indeed, this sport is characterized by high differentiation and fixation of muscle tone at each specific moment in time. The mechanism of this is not entirely clear, and the volume of research (18 observations) does not allow us to talk about the high reliability of the results. At the same time, the presence of a high correlative connection between complex visual-motor reactions indicates the promise of our assumption. Indeed, to a certain extent, the degree of control of the cortex (consciousness) and spatial differentiation in the sensorimotor area is reflected between these indicators and the level of physical fitness. It is natural to assume that the control of motor activity is dominated by the implementation of the sum of "simple" acquired reflexes, which are the basis of sports activity. Indeed, according to the authors [2,4,], the relatively rapid implementation of a simple visual-motor reaction and a complex visual-motor reaction underlies the "postsynaptic Hebbian learning mechanism," accompanied by an increase in hippocampal activity. And an increase in both energy and plastic metabolism in this department, in particular, an increase in the speed of synaptic transmission [5], an increase in the strength of the "potentiation" impulse [1], protein kinase activation, and axonal growth into the sensorimotor area.

Implicit learning, without special effort on the part of consciousness, which, undoubtedly, is the development of a conditioned motor reflex in swimming - a group of acquired movements probably does not require significant volitional efforts.

**Conclusions.** The most informative neurodynamic indicators of a complex visual-motor reaction and the level of physical fitness have been established, characterizing the functional capabilities of the motor parts of the central nervous system when performing loads in swimming. The ambiguity of the ways of implementing simple and complex visual-motor reactions is noted; It was determined that indicators of functional mobility of the motor parts of the central nervous system have group differences and correlate with the functional state of the young athlete. The features of the relationship between indicators of simple and complex visual-motor reactions characteristic of a specific type of physical activity have been established.

Thus, we define the "functional state of the athlete's body" as an integral characteristic of the state of health that reflects the level of functional reserve that can be used for adaptation that realizes a specific muscle activity, body systems. Physiological assessment of one of the most important indicators of an athlete's fitness – functional state – must be comprehensive and consider the following criteria: anthropometry, cardiac optimality regulation, tolerance to physical exertion, the state of locomotor function and stability. At the same time, the physiological assessment of the athlete's functional state should be integral, reflect the body's adaptive capabilities (functional reserve), be universal and be performed as far as possible without loads, and by itself functional control should be carried out in two stages: "training" - in the conditions of specialized centers, laboratories, sports halls and "competitive" - directly in the conditions of competitions.

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**THE CURRENT STATE OF PHYSICAL EDUCATION IN HIGHER EDUCATIONAL INSTITUTIONS OF UKRAINE.**

*The main driving force of today's sport is to raise the quality of life, including the means of physical culture, should be a*