

# Problems of improving physical training at this stage of the transformation of the system of physical education

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**Purpose:** building a system of recreational physical culture on the basis of taking into account the individual characteristics of physical development and physical condition of the local population.

**Material & Methods:** analytical review of the scientific literature on the issue of the research; use the results of previous studies carried out in KSAFC in this area and published in «Slobozhanskyi science and sport bulletin» during 2015 year; the use methods of similarity and analogy, also signs semantic spaces.

**Results:** insolubility of the problem individual approach in organizing recreational physical culture in the previous period explained lack of representation of the content of individual of norm in the assessment of physical development and methods of comparison measure the differences being compared multicomponent objects. In held scientific research were developed signs semantic spaces with the introduced in its a single measure of comparable signs it possible to establish the qualitative structure of objects to be compared with any number of comparable parameters. Obtained methods separation of equifinality results into its component quality components. It is possible to obtain methods of estimating the biological age with the establishment of the individual characteristics of its course; divide the physical condition of its component parts; obtain methods for determining the available physical preparedness depending on the characteristics of the flow of biological age and current physical condition.

**Conclusions:** Obtained results of the research make it possible to proceed to the development of monitoring physical development, physical preparedness and physical condition of the various population groups and on this basis to create a scientifically based of system improving physical training on the basis of which to develop a complex of "ready to work and defense of the fatherland."

**Keywords:** testing, semantic spaces, comparison many parametric of characteristics, individualization of physical development.

## Introduction

The problem of improving physical culture was the object of the research throughout the entire period of its existence. The most detailed and its deep analysis was carried out by V. D. Sonkin in 1993 [19]. Paying attention to the importance of the problem, he emphasized that "health of the nation depends considerably on the development of the industry of the improvement which is guided by the prevention of diseases, the leading role in which play improving forms of physical activity".

Considering this problem, he allocated compound components which demand the permission, and the attention is paid that the development of the principles of formation of sports and improving programs requires the solution of a wide range of scientific problems. The special value of his work consists in the theoretical justification of ways of their permission and perhaps expected results on the way of their implementation.

**Communication of researches with scientific programs, plans, subjects**

The conducted researches are executed within the Consolidating plan of the research works of the Ministry of Education and Science of Ukraine on a subject «Innovation approaches to health of the forming technologies in school sports education « No. 0115U004856.

## The purpose of the research

The definition of ways of creation of improving physical culture which has to become the basis for creation of the complex of RWD of the Fatherland.

## Research problems:

1. To carry out the analysis of condition of the question.
2. To develop the new concept of the organization of physical education.

## Material & Methods

The state-of-the-art review of scientific literature on the prob-

lem of the conducted researches is executed; the results of the previous researches are used, which are executed in KhSAPC in this direction and published in "Slobozhansky scientific and sports bulletin" for 2015; the methods of similarity and analogies, and also the sign of semantic spaces are used.

## Results and discussion

Physical culture, representing an integral part of complete culture of the society, is its priority value and the defining factor in formation of a gene pool of the nation. The decades which have occurred in the last changes in the area of physical culture and sport, the continuous change of heads of the branch and reorganization of management personnel, the lack of the state program of the development of physical culture, the neglect by needs of higher education institutions, the poor financing educational and complete cessation of financing of economic activity in this area put a number of difficult resolved problems at KhSAPC. These problems significantly become complicated falling of standard of living of the population, shift of cultural wealth, universal promotion of a cult of violence, various perversions, advertising of alcoholic beverages and tobacco products that harmful effects on health of the population, especially children and youth.

Understanding the importance of the situation, and for the purpose of creating favorable conditions for strengthening of health of citizens as the supreme social value providing realization of the right of the personality for improving physical activity, the President of Ukraine issued the Decree No. 42/2016 of February 9, 2016 in which is told about National strategy of improving physical activity in Ukraine for the period till 2025 «Physical activity – healthy way of life – the healthy nation». All this in general defines need of reorganization of the system of the organization of physical culture and sport.

The special attention is paid to satisfaction of individual interests of the population in rendering of services in the field of the physical training corresponding to the level of his development at this stage of the development of physical culture in world practice. It caused the development of a large number of specialized forms of physical training, opening of private clubs and need of training of multidirectional instructors which could provide rendering of necessary services.

As the higher educational institution Academy of physical culture is the leading scientific and methodical center in the sphere of the activity and in wide scales carries out training of specialists of the top skills. The role and the place of higher education institution in the system of higher education are considered from this position. Setting a task of development of new concept of the organization of physical training, Academy of physical culture recognizes from the fact that it is necessary to it to create together with governing bodies of physical culture and formation of Kharkov and the Kharkov region association of sports education for coordination of activity of educational institutions of all types preparing shots of experts in physical culture of various levels for the purpose of ensuring continuity of professional education, improvement of quality of training of specialists, universal introduction of the best practices.

The most important problems of the region is providing comprehensive schools with teachers of physical culture now that demands the search of new forms of work which are directed

to the increase of efficiency of improving work with pupils and level of their physical preparedness. Today especially the question of training of specialists, capable means of physical culture to strengthen health, to raise the physical status of all words of the population, to restore physical activity after injuries and various diseases is particularly acute.

The search of new forms of the organization of the educational process and its material security as lessons of physical training at school and classes in physical education in higher education institution don't solve the tasks of improving work set for them is among these problems.

The solution of these tasks demands the development of subject training of future experts, the creation of experimental grounds. It defines need within the educational-scientific-sports complex of Academy of the development of all types of educational and sports primary organizations (special classes, sports school, schools of the Olympic reserve, college, centers for providence of permanent educational training camps of youthful and youth teams of Ukraine and for providing educational and sports-improving services to the population). A row from the listed tasks is already introduced in life. Since 2010 in academy scientific researches on subjects are actively conducted: «Theoretic-methodological bases of the creation of mass control and assessment of the level of physical development and physical preparedness of various groups of the population», the number of the state registration is 0111U000192; «Theoretical and practical bases of the creation of monitoring of physical development, physical preparedness and physical condition of different groups of the population», the number of the state registration of the subject is 0111U001206; «Innovative approaches to healthcare technologies in school sports education», the number of the state registration of the subject is 0115U004856.

The main goal of the conducted researches is connected with questions of individualization of creation of educational and training process on the basis of an assessment of level of physical development with establishment of biological age and features of his course, level of physical fitness and the current physical state.

Importance of the solution of the noted questions consists that the creation of the state system of physical education assumes the creation of uniform structure of control of physical development, physical preparedness of all population of Ukraine with the simultaneous accounting and certification of biological age and features of its course. Such information bears in itself the additional value which is connected with possibility of the creation of donosological diagnostics and the organization of preventive actions by means of opportunities of physical exercises.

The development of the system of physical education, covering all population the country and accompanying it throughout all life will allow not only to keep account of physical development of the population and to have a view of physical potential of the population, but also to provide purposeful selection of the persons having motive endowments to certain types of the motive activity making a basis of a concrete sport.

Such «Complex of readiness for work and defense» was developed and entered (RWD) into practice in the USSR in 1931. In 1934 it was added with standards for younger group of the

population and was called «Be ready to work and defense» (BRWD). Since 1972 this complex includes exercises from different types of sport. All standards were developed for 5 age groups covering the contingent of the population from 10 till 60 years old.

Certain shortcomings and the inconsistency of regional features of physical development of the population of the country making 1/5 land of all planet resulted in need of its revision that in the subsequent led to its oblivion. However the main reason for this phenomenon became a large number of sports societies in which an opportunity was presented to be engaged in any kind of sport at the level of the mass sports categories covering much bigger number of the population of all age according to their individual choice and availability according to physical capacities.

Control of physical development by the population and its physical preparedness became the priority direction in many states. The open question at all is the assessment of features of physical development of an individual and the definition of an available arsenal of motive activity to the corresponding biological age of physical development of the considered contingent of the population.

Qualitative and quantitative characteristics of the motive mode which extremely differs at different people depending on the professional activity, geo-climatic factors, and living conditions, national and regional customs make one of the most important problems of the modern development of physical culture.

Its decision is based on not less important problem which is connected with need of the solution of questions of an assessment of an initial physical condition of the organism allowing use of the specific improving program. This problem in turn demands the evidence-based theory of testing which can provide the objective and national characteristic of the opportunities of an organism of the surveyed contingent which are going in for physical culture.

The creation of sports and improving programs has to proceed from concrete requirements of individual opportunities of physical development and measures of readiness to perceive the offered physical activities. The requirement of the accounting of specific features of physical development, physical fitness and physical state assumes high level variability of the recommended individual algorithms of the creation of necessary programs. It in turn results in need of broad application of computer providing, as for use in individualization of creation of programs for optimum algorithm of the development of physical loadings, and for the expansion of educational programs in training of specialists in the field of physical training with a possibility of their free possession of a concrete technique.

In turn, the creation of optimum algorithms of individual training remains still not resolved problem as in it such tasks met at the same time as: the assessment of the level of endowments; the level of initial proficiency; the need of definition of a consecutive step of the complication available to the mastered material; the necessary time for its fixing; the determination of necessary level of the previous material for the subsequent its complication; the establishments of a limit of individual learning ability and the mode of preservation of the mastered

proficiency level.

The need of the solution of the noted tasks is connected with the fact that today many countries of the world are guided by the prevention of diseases by not drug-induced means, improving forms, and physical culture which methodical fundamentals still demand deep and comprehensive scientific justification in order that they could turn into technology of improvement fully. The development of the principles of formation of sports and improving programs requires the solution of a wide range of the scientific problems which are closely connected with various fields of knowledge, including the exact sciences, such as mathematics, physics, chemistry; natural sciences to which anthropology, biology, physiology, anatomy belong; and finishing with humanitarian fields of knowledge – sociology, economy, etc.

Concerning such difficult questions as improving physical culture and control of physical development of an individual, its adequate level of physical fitness and an assessment of the current physical state, naturally arises as it was already noted, the task connected with the development of the evidence-based system of testing. Testing of physical fitness submits to the general principles of testing in any area of human activity. The main essence of this process consists in obtaining necessary information for idea of the going on process or an assessment of any properties of the observed phenomenon. Any system of testing has to possess the most available idle time, validity, reliability, reliability and objectivity.

Practice of testing in physical culture is based on two approaches. One of them is based on the measurement of results of the carried-out activity and the subsequent their assessment, or on the measurement of reaction of any physiological systems to standard loading and the assessment of a measure of change of their activity that makes the group of biomedical tests. The classification of methods of testing can be chosen depending on the purpose. Similarly concrete tests can be chosen. Any classification is defined by the creation of the consistent system for use of the classified objects in compliance with facing the purposes of the researcher [22].

This purpose consists in an assessment of «the level of health» in improving physical culture which has no unambiguous definition today [10; 13; 15; 16; 23].

The average characteristic is established and concerning it the subsequent process of comparison is carried out in all cases on the basis of the obtained data of testing. Individual distinctions in each case can be estimated by a size of deviation at the big or smaller party from its average indicator. The difficulty of the compared objects of comparison as the received individual «profile» of a deviation grows at the increase in a kind of the used tests as it is difficult to interpret and give the preferable characteristic to the observed results. Therefore, except insufficiently precisely this content of determination of «the level of health» or «the level of motive preparedness», the single test can't characterize the multidimensional importance of these concepts [7; 19; 23].

In practice it is necessary to use complexes of the tests providing a multidimensional assessment of the object of supervision [8; 18; 21]. The development of such complexes is carried out from a parcel most fully to characterize everything a variety of properties of an organism. Such multidimensional

assessment is very inconvenient for its interpretation. It leads to aspiration to mark out the «defining» properties on which assessment the main attention is concentrated. Eventually the solution of an objective is consolidated to the development of statistical models or definition of the standard to each of tests on the basis of the empirical data which are used in the battery of the applied tests. Such model serves as the standard of comparison, and the assessment is given on the extent of coincidence to each model characteristic of the test separately. At the same time there is a problem of commensurability of a measure of the importance of the observed rejections of each test when receiving the identical end result.

Not resolution of this problem leads to use of the multidimensional statistical analysis of the used selection of tests on the basis of which the models representing the equations of multiple regression are under construction. In this case the problem of comparison and the measure of its assessment aren't solved as further it is necessary to carry out the comparison of all set of results of each investigated.

Actually the problem of testing remains not resolved so far. It is connected first of all with an illegibility of definition of what should be tested; the choice of those tests which are suitable for the solution of an objective and a way of comparison of the received results on degree of their invariability. The choice of the concrete test is defined depending on a problem of testing. If the assessment of suitability of an individual for any activity is carried out, then in this case the availability threshold which overcoming testifies to sufficient compliance of an individual for classes by the chosen type of motive activity is defined. Selection of «material» is practically carried out. Who can pass a test with the entered suitability assessment, which is allowed to classes with an appropriate level of complexity of motive activity. The sequence of the becoming complicated loading is defined by its availability that is the cornerstone of an assessment of qualification of level of the achievements which are engaged in this type of specialized sports activity.

A certain way of its complication is developed in each specialized type of motive activity (sport). Certain specifics of a ratio of motive qualities are the cornerstone of such complication that defines qualitative feature of its construction, and degree of expressiveness of its complication that determines the absolute level of possible achievements. In this case the test for selection is the sequence of steps of complication of the mastered motive activity, and absolute value of the achieved result acts as an indicator of achievement. The level of step-by-step assimilation of the becoming complicated task acts as the entered suitability assessment to the development of the chosen motive activity. The process of selection, in this case, is carried out in the empirical way. There are those which are capable to reach equilibrium interaction with the selection environment. But in this case there is an unresolved question of preliminary selection at the initial stage of training of sportsmen.

Regardless of a sport, success which is defined by congenital predisposition to specifics of motive activity; the limit of skill is reached thanks to motive endowments of an individual. Sport acts as a factor of natural selection which leaves on the arena of only the most adapted for the corresponding extreme conditions of competitive activity.

Sport in general can be considered as the creation of the artificial training environment in which there is a selection of

the chosen by this environment. Actually the basic principle of evolutionary development consisting in natural selection is used in this environment.

Essentially other role is played by the process of testing in the solution of the tasks arising in mass improving physical culture. In this case it is not about selection, and about the assessment of qualitative features of an athletic ability of an individual for the definition of the available motive activity necessary for normal physical development of the individual taking into account its morphofunctional features and the current physical state.

In this case the set of tests has to capture various motive activities, which are characteristic of natural activity of the corresponding period of physical development of the investigated contingent. Such tests define limits of availability of performance of various type of motive activity to each specific individual. The qualitative characteristic of individual structure of motive activity for the corresponding period of physical development is defined by the delimitation of availability of the performed task according to each test from the used battery of tests.

Therefore, there is a problem of definition of «norm» of motive activity for each age period which includes the qualitative structure of creation of the movement and the quantitative characteristic of its manifestation depending on the current physical state and features of morphofunctional development. Despite absolute theoretical validity of the communication of physical development and the constitution of a somatotype, now typological features of structure of a body aren't taken into consideration either in the applied medicine, or in the theory and practice of physical culture. The reason of such situation is connected either with complexity of use of methods of an assessment, or with insufficient resolvability of an appropriate question.

The extremely important role was played by the BRWD and RWD complexes for an assessment of the qualitative characteristic of physical fitness of the population. However the wrong understanding of a test role of exercises and standards of their performance haven't allowed taking all value of collected statistical material. Without having the correct assessment of creation of norm of performance of each of exercises and creation of the general norm of the assessment, which is reflecting result of performance of all exercises, which are entering a complete complex led to its addition with a number of exercises from mass sports.

Insufficient correction of the introduced standard requirements to formation of the general assessment of physical preparedness and physical development resulted in need in the 60th years to revise standards practically for all tests, entering the complex RWD [9]. Attempts to develop regional standards of the complex RWD were made in the subsequent [18]. Questions of need of the account anthropometrical and morphofunctional characteristics, inconsistency of an assessment of results in various motive tests, unspecified understanding of semantic contents regional individual norms and norms in general brought a solution into the deadlock [20].

In 1976 new approach gained the development to the creation of complexes of tests [18]. Such complexes of tests were KONTREKS-1, KONTREKS-2, KONTREKS-3 [12]. Standards

of WHO for the PWC<sub>170</sub> test were entered into practice of an assessment of "physical state" [7; 14; 24]. However the lack of theoretical justification of concept of norm and zone of a functional optimum didn't allowed solving the existing problem. In spite of the fact that the complexes BRWD and RWD remained a lot more years a basic basis of physical training at schools, high school programs for physical training, and their importance was gradually lost. The issue of satisfaction of individual interests and interests in specific motive activity was more and more widely resolved, but problems remained insoluble in the process of the development of mass sport.

Problems of mass improving physical culture still demand the development of standard evaluation criteria and the basis of creation of test criteria for evaluation of the qualitative characteristic of structure of individual physical development, physical fitness and physical state necessary for the creation of the state system of the physical culture based on the uniform, theoretically reasonable standard criteria and tests which are based on the accounting of specific features of physical development and biological age of the investigated contingent. The solution of these questions is executed according to scope of the scientific researches which were conducted in KhSAPC.

Implementation of the received decisions became possible thanks to the development of new methods of representation of results of the conducted researches in the special sign semantic spaces from the uniform measure of representation of an order of placement of the compared signs which are entered into them [17]. It allowed establishing such important characteristics in construction of interdependent morpho-functional educations as criterion of constancy of the relations, criterion of constancy of occurrence of these relations. Use of dimensionless units in the system of sign semantic spaces allowed entering a uniform measure of norm of the received results of test estimates of the investigated contingent regarding their physical development, physical fitness and physical state [17]. The solution of this task gave the chance to establish a measure of invariability of the compared objects with introduction of any necessary quantity of the compared signs. At the same time the order of structure of following of signs is defined; the measure of their remoteness in the ranged number of their representation, deviation degree from the entered standard of norm of their manifestation.

The opened possibility of multiple parameter comparison of

the compared objects allowed to resolve an issue of an assessment of biological age and to unveil specific features of its manifestation that morphofunctional educations in the structure of creation of a complete organism explains the variability nature. In turn, it explains the nature of various adaptive opportunities and gives the chance to development of donosological diagnostics that is especially important in creation of system of improving physical culture [11; 5].

Use of semantic spaces allowed presenting the qualitative structure of manifestation of a physical state, having divided it into a "conservative component" and the current adaptive physical state. This problem was lifted by V. D. Sonkin in 1993 [19], however it couldn't be resolved without the development of the new methods allowing to divide the quantitative characteristic of the received result and qualitative structure of its providing. The received results of the conducted researches in the field of the development of innovative technologies in improving physical culture allow starting directly implementation of the program of the development and the creation of monitoring of physical development, physical fitness and physical condition of various groups of the population.

## Conclusions

1. The use the developed sign semantic spaces and methods of comparison of the qualitative structure of multiple parameter characteristics of physical development, physical fitness and physical state allow entering the accounting of specific features of these data into the system of improving physical culture.
2. The existence of the techniques allowing considering specific features of the course of physical development, the level of physical fitness and physical state open a possibility of creation of monitoring of dynamics of the course of these indicators and control of the level of physical viability of the controlled contingent.

## Prospects of further researches

The further continuation of researches in this direction will be connected with the development of the system of collecting, processing of necessary information on physical development, physical fitness and physical state for its use in the management by the system of improving physical culture.

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