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The journal is intended for teachers, coaches, athletes, postgraduates, doctoral students research workers and other industry experts.

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2. Improving the training of athletes of different qualification.
3. Biomedical Aspects of Physical Education and Sports.
4. Human health, physical rehabilitation and physical recreation.
5. Biomechanical and informational tools and technologies in physical education and sport.
6. Management, psychological-educational, sociological and philosophical aspects of physical education and sport.
7. Historical aspects of the development of physical culture and sports in Ukraine.

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CONTENT

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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 introducted 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_{170} 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 morphofunctional 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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The determination of efficiency of a special obstacle course for training of cadets and rescuers of Public Service of Ukraine on emergency situations

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Purpose: *to determine directions of the improvement of the educational and training process of cadets and retraining of rescuers of Public Service of Ukraine on emergency situations (PSES) for carrying out the search-rescue works in highlands.*

Material & Methods: *the contingent – cadets (25), rescuers (25) and officers (25) of Public Services of Ukraine on emergency situations took part in the research. The following methods are used for the solution of objectives: the theoretical analysis and generalization of scientific and methodical literature, pedagogical methods of research (poll and questioning).*

Results: *the main requirements to a special obstacle course were defined on the basis of studying and analysis of biographical particulars with the purpose of the improvement of rescuers of PSES for carrying out the search-rescue works (SRW) during the emergency situations (ES) of a natural character.*

Conclusions: *the need of modeling of weather conditions on a special obstacle course is defined for the purpose of the improvement of the level of preparedness of staff of the search-rescue groups in highlands.*

Keywords: *special obstacle course, wrecking, educational-training plan, modeling.*

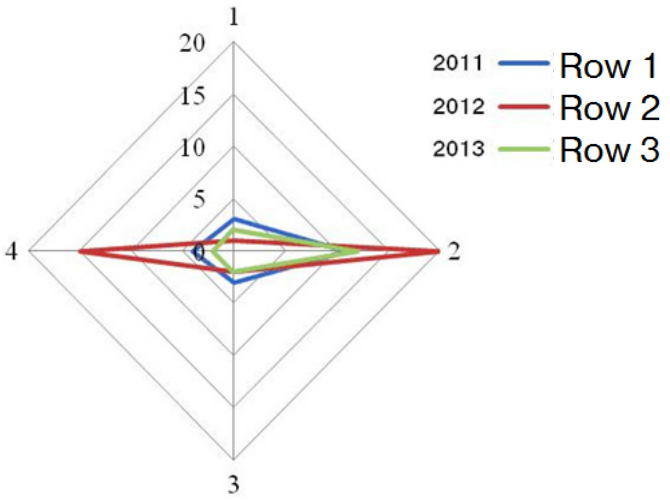
Introduction

There are several climatic zones (regions) with natural disasters, characteristic of them in the territory of Ukraine [2; 6]. Carrying out wrecking during natural disasters in each separate case demands certain skills and abilities. Efficiency of carrying out wrecking by search and rescue groups is defined by the level of preparedness of fighters of PSES of Ukraine to a performance of work in the mountain district [1; 2; 7; 9].

Training of future rescuers of PSES of Ukraine has to be carried out taking into account a possibility of effective carrying out wrecking by search and rescue groups in various climatic conditions, land relief, at influence of a large number of factors of the environment [1–5; 7–11].

The analysis of total of the natural disasters which occurred in Ukraine for 2011-2013 showed that the meteorological dangerous phenomena prevailed (pic. 1). Also the geological and hydrological dangerous phenomena (DP) were observed. Besides, the growth of the emergency was noted, which is connected with fires in natural ecosystems – in 3,75 times [2].

The data set of the facts makes increased requirements not only to special preparedness of cadets and employees of PSES of Ukraine [2; 7], but also to the level of the most educational-training process, in particular to a special obstacle course. The correction of the educational-training process is necessary, including imitation of the natural dangerous phenomena on a special obstacle course for the purpose of formation of necessary skills at cadets and rescuers of PSES, their adaptation to conditions of the future professional activity.



Pic. 1. The emergencies of natural character which happened on the territory of Ukraine for 2011-2013: *1 – Emergency of geological character; 2 – Emergency of meteorological character; 3 – Emergency of hydrological character; 4 – The emergencies connected with fires in natural ecosystems*

However the special obstacle course is intended for working off of skills and improvement of technology of fire extinguishing. The experiment made earlier with use of the modules, imitating weather conditions, proved need of correction of the educational-training process of cadets of PSES [9].

Thus, the search of ways of improvement of the educational-training process of cadets and students of PSES is relevant.

The purpose of the research

To define the directions of improvement of the educational-training process of cadets and retraining of rescuers of PSES of Ukraine for carrying out wrecking in the mountain district.

Research problems:

1. To develop the questionnaire for studying of a problem of the organization and carrying out wrecking at an emergency of natural character in the mountain district.

2. To carry out the analysis of methods and means of training of cadets and rescuers of PSE of Ukraine for actions at an emergency of natural character.

3. To define possibilities of use of special modules in the adapted obstacle course during training of cadets and retraining of rescuers of PSES.

Material & Methods

Cadets (n=25), rescuers (n=25) and officers (n=25) of Public service of Ukraine on emergency situations have taken part in research. For the solution of objectives the following methods are used: theoretical analysis and generalization of scientific and methodical literature, pedagogical methods of research (poll and questioning).

Results and discussion

The questionnaire was developed by means of which questioning of cadets and students of PSES of Ukraine is carried out, and also specialists in carrying out wrecking for the solution of the first task [1; 6; 7].

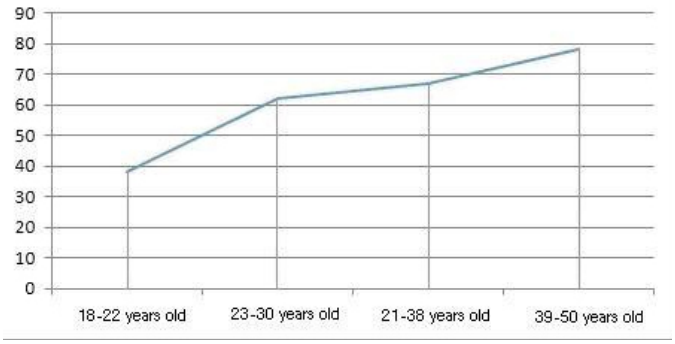
The questionnaire included 10 questions allowing revealing opinion of respondents on compliance of a special obstacle course on training of rescuers for carrying out search and rescue works in the mountain district. Besides, questions of efficiency of introduction in educational and training process modeling of conditions of carrying out a wrecking in the mountain district were formulated course in the questionnaire during an emergency of natural character by means of a special obstacle.

The questioning allowed to reveal features of the educational-training process of cadets and rescuers of PSES of Ukraine, and also to define the existing problems in the organization of the educational-training process at training of specialists for carrying out wrecking in the mountain district. Questions of the questionnaire were differentiated on an age, a rank and a post of a respondent.

It is revealed that cadets of older years keep the watch in the operating parts of PSES [6]. However the experience of carrying out wrecking by cadets in the mountain district is minimum or it is absent. It is also necessary to note insufficiently effective carrying out the professional development of the acting rescuers for carrying out rescue efforts during an emergency of natural character in the conditions of the mountain district.

So, less than 5% of respondents answered affirmatively a question of experience of carrying out wrecking in the mountain district during an emergency of natural character. According to most of respondents, there are no modules imitating weather conditions on the existing obstacle course.

Tendency is so that more senior experts on age consider a special obstacle course [6] non-compliant to the requirements on preparation and improvement of abilities of rescuers for carrying out a wrecking in the mountain district.
Dependence between age of respondents and quantity of affirmative answers a question of need of inclusion of elements of imitation of weather conditions for a special obstacle course (pic. 2) is defined.



Pic. 2. Results of questioning of cadets and experts of PSES – a question of need of imitation of a wrecking for the mountain district

Depending on a post and a rank, the opinion of respondents on need of imitation of wrecking in the mountain district also differed during the educational-training process (tab. 1).

As the experience of actions in the mountain district was available for the small number of the interrogated rescuers (6%), it is difficult to give the answer about expediency of imitation of weather conditions during training 21% from the interrogated rescuers. Thanks to the gained knowledge, only 14% from the interrogated officers were experienced difficulties with the answer. However most of rescuers and officers, 67% and 78% respectively, consider necessary application of imitation of weather conditions on a special obstacle course.

Table 1

Results of the questioning about need of imitation of various weather conditions, %

Respondents	Answers a question of need of imitation of various weather conditions during training		
	It is necessary	There is no need	It is difficult to answer
Rescuers of PSES (ordinary and non-commissioned officer's structure)	67	12	21
Officers of PSES	78	8	14

Thus, the conducted research allowed to reveal the existing problems and to define ways of improvement of the educational-training program of training of cadets, students and rescuers of PSES of Ukraine for carrying out wrecking in the mountain district.

Conclusions

1. The analysis of the obtained biographical particulars and the tendency to increase in an emergency of natural character allowed defining relevance of the problem of improvement of the educational-training process of training of rescuers for carrying out wrecking in the mountain district.

2. It is revealed that the existing obstacle course doesn't correspond to conditions of carrying out wrecking during an emergency of natural character.

3. The number of the experts increases, who are considering necessary introduction of elements of imitation of an emergency of natural character on the adapted obstacle course with the increase in age of respondents, and also experience of carrying out PSES in the mountain district.

4. As a result of the questioning it is established that use of special modules of an obstacle course imitating various factors influencing rescuers during wrecking in the mountain district, is perspective.

The prospect of further researches

Is connected with optimization and improvement of the educational-training process of cadets and rescuers of PSES of Ukraine for carrying out wrecking in means of a special obstacle course.

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Training of referees in wrestling

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Purpose: *the analysis of problems in the training of referees in wrestling.*

Material & Methods: *theoretical analysis and generalization of literary sources, pedagogical observation.*

Results: *the analysis and generalization of the opinions of experts shows that the success of the complex of judicial activities caused by the judges' experience, knowledge of the techniques and tactics of wrestling and a high level of development of professionally important psycho-physiological functions.*

Conclusions: *given the lack of professional officiating freestyle and Greco-Roman wrestling, the preference shall be given independent forms of training short-term precompetitive workshops not only for training, but and for testing of individual capabilities of individual judges.*

Keywords: *wrestling, international judging activities.*

Introduction

Sports science is deeply developed and implemented training methods for athletes and coaches in sports, many teams are equipped with modern video equipment, a variety of teaching AIDS, sports teams are continuously integrated monitoring the preparedness of athletes.However, in the field of refereeing of similar research and development, advanced methods of selection and training were not affected. A weak reflection of the issues of refereeing in scientific-methodical literature, no method of selection and training this activity led to a noticeable lag of skill of the arbitrators on the level of development of this prestigious sport [5].

The current stage of development of the struggle defines the action of the judicial personnel in the context of a significant increase of physical and mental stress referee modes, steady, orderly progress of performance skills of participants, improve their speed-power qualities. The judging in the fight is of particular importance due to the fact that is a result of subjective evaluations of different match situations arising in different parts of the carpet that involves a significant amount of displacement. Practice shows that not all athletes and coaches (and of them mostly completed and the judiciary at the present time) to quickly and successfully master this specialty[8].

Many of those who in one way or another was for many years connected with struggle, it is not possible, however, to become qualified arbitrators or moral reasons, or because of insufficient knowledge of methods of judging, either because of low level of physical preparedness, or in its restricted psychomotor capability,impeding the achievement of knowledge and skills in acute and short-term competitive situations[14].

Unfortunately, there are currently no scientific data, and among professionals there are contradictory ideas about the structure and leading factors of judicial craftsmanship, informative and reliable about the gauges, suitable for diagnostics and control in the selection and training of judges, about the organizational-methodical bases of selection and effective training and education of judges of high qualification[6].

The connection of the research with scientific programs, plans, themes

Work performed under the research plan of the National technical University «Kharkiv Polytechnic Institute».

The purpose of the study

The analysis of problems of training of referees in wrestling.

Material & Methods

To solve the target bili sleduyushie used methods: 1) analysis and generalization of data of scientific-methodic literature data and the Internet; 2) analysis and synthesis of best practices; 3) teacher's observations.

Results and discussion

As in any activity, refereeing can distinguish the objective and subjective difficulties. W. Jones sees the difficulties of refereeing in the first place in the special position of the arbitrators as representatives of the sports laws. Judges expect absolutely bespristrastno and error-free solutions, however, fair to say that refereeing errors, like in any other activity[2;7].

However, no matter how competent the referees were not, you cannot expect complete satisfaction from all stakeholders. most of the known authors notes that losers are subjective, as a rule, incorrect assessment of the officiating. On the other hand, the winners, with rare exceptions, characterized the refereeing in the competitions ended, in the highest degree positive. Subjective in substance and perception of judging journalists and commentators, but most importantly, unfortunately, and officials that directly affects the credibility of the referee, further judicial actions[3;11].
Among the factors that negatively affect the judging of the wrestling matches are highlighted specific features of the

organization of competitions, namely, to their long-term nature, frequent trips, an arbitrary alternation of competitions of different age groups and categories, with the result that the activity of the arbitrators is not subject to the condition of the gradual increase in the degree of difficulty,systematic development of state of fitness, which leads to changes in the level of refereeing and officiating of referee form[1].

Some authors are of the opinion that is in itself a special emotional background of wrestling matches thoroughly complicates judicial activity.

High emotional stress in major competitions largely created by the presence of a large number of viewers located indoors in a special proximity to the carpet. The ardent support of his team,the violent reaction of the fans on a separate decision of judges is called in some cases such a noise that I do not hear the whistles of arbitrators[9].
In the process of competition referees have to engage with participants in a kind of interpersonal relationship. Unfortunately, as recognized by many authors, are the direct psychological vozdeistvuya on judges,as in the combat, and,before, and after[2].

The activity of the judge against exceptionally intellectually saturated. Of particular importance is the strict and proper compliance with various articles of the rules,guidelines,regulations, official documents[2].

Adversely affect the activities of the arbitrators and long breaks in publishing of methodological literature.In particular, over the last ten years have not released any manuals for refereeing of competitions in wrestling. Among the «factors» of judging can also be inadequate or too bright lighting, poor state of training facilities to officiate and rest of the judges, the poor quality of the Secretariat's work[13].

Unfortunately, the task of staffing the judiciary with many highly qualified arbitrators is very difficult due to the scarce amount of information and slow penetration into this area of research.

In some known works attempted to treat the issues of judging from the standpoint of sports science, however, the most important aspect of the problem is not sufficiently developed.

So, almost completely bypassed the authors question about the selection and integrated control training of arbitrators, there are virtually no data on experimental verification of the effectiveness of the proposed training programmes, not developed quantitative estimates of the number of critical factors, preparedness and the quality of refereeing[10].

Existing work on the issues at hand are rather a prerequisite for research, as predstavljajut only a partial pedagogical recommendations.

In the sports literature rightly emphasizes the connection with the success of the activities conducted with pre-selection for her[10;6].

The authors are Yu. p. Zamyatin, and others, convinced of the need for purposeful selection with regard to the prediction of various aspects and among a large number of different persons[7;9].

Recorded evidence that high level athletes differ from less skilled level of development of physical qualities and a number of physiological and morphological characteristics[4].

G. S. Tumanyan and E. G. Martirosov[9] showed that there are dependencies between the anthropometric characteristics of athletes of different specializations and achievements in sport activities. Anthropometric characteristics have a significant impact on the level of development and manifestation of speed, endurance, strength, adaptation to different environmental conditions. B our case, it is clear that the characteristics or discrepancy with the Constitution cannot be an obstacle to practice judging, and stipulate only the use of certain elements of their personal training.

The skill of the arbitrators has its own very specific age boundaries, and other than the players. In some works provided evidence that the age of the judges on team sports for the most responsible competitions of approximately forty years. It is considered that the decisive factor existing, in fact, natural selection is the accumulated practical experience of refereeing of arbitrators[11]. In sports games, international and national federations established age limits to attract judges to the competitions, however, such solutions have no scientific basis and fair criticism[10].

It is obvious that at the present stage of development of wrestling, the selection for judicial profession needs to academic positions to act as a complex pedagogical process that requires a certain form and content. Centralized training wrestling arbitrators provided for in the children's sports facilities, but it is already at the first stage is very difficult[3].

The correctness of bringing to the judicial activity of the young men confirmed by the statements of many experts, so as to become the judge of high qualification, you need at least 5-7 years.
However, existing proposals differ in any known contradictory or not specific enough, because today the training of judges is a distinct individual characteristic the basis of knowledge gained through personal experience[6].

Apply self-studies, supported by participation in workshops or short-term judicial training camp[8].

In the sports literature reflected the idea of the integrated training of arbiters according to the method of judging, but also in other important disciplines: pedagogy, psychology, and physical training[5].

Despite the fact that the issue of integrated control of theoretical, physical and psychological fitness of referees has received some coverage, fundamental studies on the relationship between the controlled parameters with the quality of refereeing in the works is not detected[4].

Following the complexes benchmarks do not have a common methodological structure, levels of requirements in certain types of fighting are significantly different ,and the tests themselves are often replaced unnecessarily and do not respond adequately to modern requirements. Despite the importance of regulatory requirements for arbitrators, reflecting the degree of their physical fitness, theoretical knowledge, the level of development of psycho-physiological characteristics, as

the basic criterion of qualification and training of judges, advocates a direct analysis of the quality of practical refereeing. It is conducted by various means: on the observation results of the screening commissions and judges - inspectors and judges-commissioners, using videozapisi contractions[13].

Conclusions

1). In analysing the activities of the judges during the judging of fights had been identified 4 groups of signs of subjectivity (bias) of the judging:

1 group - delay (increase) - time assessment of the situation;

Group 2 - correction and evaluation of the standard provisions (POS) (contact and verbal action);

Group 3 - designing and evaluation of dynamic situations (contact and verbal action);

Group 4 - stop the fight at the beginning of the reception (advance, attack breakdown), inadequate assessment of the situation.

2) Analysis and synthesis of the opinions of experts shows that the success of the complex of judicial activities caused by the judges ' experience, knowledge of the techniques and tactics of wrestling and a high level of development of professionally important psycho-physiological functions.

3) It is established that judges of the higher qualifications of judges differ from low-skilled to higher-level indicators of balance of nervous processes, emotional resilience to stressful situations, good sensitivity of the visual analyzer of data and the best decisions judicial situations over time and the correctness of the decision.

4) On the basis of indicators of level of development of professionally important functions of the judges of the different skills developed by the system of normative requirements to the body of arbitrators and the method of their evaluation. Its component indicators have predictive value and reliability and can be applied for the selection of judges of the wrestling competitions of any rank. Training of judges should include means and methods aimed at the improvement of psycho-physiological functions, ensuring instant, appropriate response to situations of fighting, to reduce emotional tension. Given the lack of professional officiating freestyle and Greco-Roman wrestling, preference shall be given independent forms of training short-term precompetitive workshops for not only training but testing of individual capabilities of individual judges.

The prospects for further research

In this direction is of the poll and poll the judges of the international categories to identify the problems of subjectivity of refereeing in wrestling; development of a program for the preparation of independent arbitrators.

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Health-improving action effects of the system of P. K. Ivanov and Breathing Technique on the method of K. P. Buteyko for people of different age (from the long-term experience of the author)

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Purpose: *estimate efficiency of using of the system of Porfiry Ivanov and Breathing Technique on the method of K. P. Buteyko in health promotion for people of different age and physical condition.*

Material & Methods: *there were 160 adult persons (113 women and 47 men) on the age of 36–54 years with different physical condition under our supervision. All the researches were provided on the ground of Brovarskyi city club of natural health improvement of people using the system of P. K. Ivanov «Vodoliy» (Water Bearer) (Kyiv region). There were applicable theoretical methods (includes analysis and synthesis of scientific and methodical literature), empirical method (includes functional and psychophysiological analyses) and statistics methods.*

Results: *there were also indicated positive matters in the dynamics changes in indicators of the physical health.*

Conclusions: *there were proved that, health-improving system of P. K. Ivanov and Breathing Technique on the method of K. P. Buteyko reasonable for practical use on filling of take on the purpose of health-improving action effects for people of different age.*

Keywords: *system of Ivanov, method of Buteyko, health, adults.*

Introduction

What kind of way in respect of preservation and promotion of health will chose a person of the XXI century? She will live in "harmony" with the Nature, to feel like a full-fledged member of the society from the birth till the extreme old age or, on the contrary, her existence will be connected with drugs and hospitals is defined in the majority by a way of life of a person, level of physical activity, training and so forth.

Today the special attention in the improvement of people of different age is deserved by methods of nonconventional medicine. It is necessary to distinguish the system of natural improvement of the person Porfiry Ivanov and the method of breath according to K. P. Buteyk among a big arsenal of the mentioned methods. These methods are simple and available to everyone. At the heart of the first method (system) – love and trust to the nature and people, wish health to everybody, help to those who need it, also bathing in open reservoirs or dousing with cold water, conscious refusal from food and drink for a certain period of time, mental self-control, observance of moral standards, and so forth [3]. According to the second – strong-willed elimination of deep breath which consists in reduction of depth of breath through strengthening of will of a person by relaxation of respiratory muscles [4].

It would seem, health of a person has to become his primary requirement as life needs it. Unfortunately, a «blind» belief in medicine, in its main remedy – pills by means of which a person without any efforts can become healthy, is a psychological basis of neglect of real opportunities of strengthening of health. The last as I. Muravov and E. Bulich [7] note, has to be based on a replacement of traditional strategy of health care that provides prevention and treatment of diseases, and elaboration of essentially new strategy – stimulation of viability and protective forces of an organism. Not the last role in it, in our opinion, has to be allocated for nonconventional methods of the improvement of a person.

Spiritual and improving effects of training of teenagers who play sports, forces of nature according to the system of Porfiry Ivanov are given in the previous work [8]. We consider it is necessary to give results of our long-term researches which concern the improvement of people with a different physical state by means of the above-mentioned methods.

Communication of the research with scientific programs, plans, subjects

The research was carried out according to subject of of the RW of the department of biological bases of physical training and sports disciplines of National pedagogical university named after M. P. Dragomanov «Medicobiological and valeological problems of human health with a different physical state».

The purpose of the research

To estimate the efficiency of use of the system of Porfyriy Ivanov and breath according to K. P. Buteyk's method in strengthening of human health, different in age and a physical state.

Material & Methods

There were 160 adult persons (113 women and 47 men) of 36-54 years old with a different physical state [almost healthy (29,4%) and sick on cardiovascular and bronchopulmonary chronic diseases under our supervision within 10 years (from 1990 till 2000), which were in a remission stage (70,6%)] for carrying out improving classes on mastering a technique of superficial breath and natural training.

Researches were conducted in the group "Zdorovye" at Brovarsky city club of the natural improvement of a person according to the system of P. K. Ivanov «Vodoliy» (Brovary, the Kiev Region) (the state registration number is 406-271-Club of May 19, 1992). Educational and improving classes on mastering a technique of the strong-willed elimination of deep breath (SWEDB) according to Buteyk and training were carried out in the second half of a day (from 17:00 till 19:00 o'clock) through one-two days within 30 days. The assessment of a functional condition of men and women was carried out in three steps: the first stage – before classes, the second – in 30 days and the third – in 6 months after classes.

Classes were given under the leadership of the author of the article – the head of the club "Vodoliy" with avlong-term experience of training, and also the doctor-methodologist of SWEDB according to K. P. Buteyk (the certificate No. 7/2 of January 31, 1989 is issued by Kiev research institute of phthisiology and pulmonology of a name the academician of F. G. Yanovsky MES of Ukraine).

Research methods: 1) theoretical (the analysis of scientific and scientifically methodical literature from problems of use of nonconventional methods of improvement), 2) empirical: functional (the express method of an assessment of somatic health) and psychophysiological [testing of the main mental functions (memory, attention)] as the components of mental health of a person making intellectual [2], 3) statistics methods.

The research of specific features of *a short-term visual memory* was conducted by a technique "memory on geometrical figures" [5; 6]. The investigated was shown forms with the image of geometrical figures in number of 7 pieces at the implementation of this test. The investigated has to remember their arrangement during 30 s, and then to reproduce the given figures on the empty registration form for 45 s. The test task was performed twice with use of similar forms. The quantity of correctly located figures (QCLF, units) of the investigated was counted for the entire period of a work. The assessment to a condition of "visual memory" of an individual was given in conditional points by the results of a performance of two tasks.

The assessment of attention was carried out by the proof test of V. Ya. Anfimov with use of the alphabetic table [5; 6]. The investigated was offered to delete conditional two letters in each of lines of this table. In the following researches the ratio of letters changed. The work duration –is two minutes. The following indicators were defined, which characterize a function of attention: quantity of the reconsidered signs (A, units), quantity of correctly deleted letters (B, units), quantity of the carried-out mistakes for all the time of work (QMi, units), and also concentration of attention which was estimated by its such components as speed of revision of signs (SR, con. units), correctness coefficients (CC, con. units) and efficiency of performance (Ke, con. units).

The research of somatic health was carried out by the express method of G. L. Apanasenko [1].

Results and discussion

At first we will analyze the nature of changes of functions of memory and attention that developed in an organism as a result of use the mentioned improving methods of the investigated.

As it was noted earlier, the assessment of function of *memory* was carried out according to the estimates of quantity of correctly located figures. We adhered to such situation when carrying out the direct estimation of this function: the more the investigated could reproduce correctly geometrical figures in each of two forms (the last, as a result, automatically influences reduction of quantity of the made mistakes), the higher indicator of function of memory was at him [6].

The analysis of tab. 1 and 2 testifies about thre essential (on 1% levels of the statistical importance) increase in quantity of correctly located figures which are registered on the second (II) and third (III) stages of the investigation in comparison with the first (I) both at men, and at women.

Almost the same nature of changes of function of *attention* is observed with the above-mentioned mental function. Results of the research of the last in dynamics (according to the first, second and third stages of the investigation) are presented in tab. 3 and 4.

The analysis of changes of indicators of the mentioned function at men which are given in the tab. 3, specifies on a reliable (at $P<0,05–0,01$) increase in total of the reconsidered signs in two minutes of a work (A), quantities of correctly deleted letters (B) and reduction of quantity of the made mistakes (*QMi*), in the course of the carried-out improvement. The fact draws attention that a reliable (at $P<0,01$) increase of efficiency of a performance (according to registration of an indicator of *Ke*) this group was carried out at the expense of a reliable (at $P<0,01$) increase as *speed of revision* (*SR*), and the correct performance of work (an indicator of *Cc*).

The same nature of changes of function of attention is observed at women (tab. 4).

The distribution of the investigated (men and women) on indicators of somatic health which was defined by reserves of bioenergetics organism (G. L. Apanasenko's method) at different stages of the research is presented in tab. 5.

We find that men and women had a low level of somatic health. The investigated were on an average, below an average and low levels. There wasn't any person with high and above average levels. The level of their health has improved in 30 days of classes. The confirmation of it is the increase to percent of the investigated with an average (57,4% of men and 75,2% of women) and above an average (respectively 4,3% of men and 0,9% of women) levels and lack of persons with level below an average. The number of persons who have moved to the level above an average (12,5% of persons were among men , and among women – 4,5%) increased in 6 months of independent classes. As annoyingly, but there was no person with the high

Table 1

Average indicators of a short-term visual memory at men of 39-54 years old which were engaged according to P. K. Ivanov's system and a technique of breath of K. P. Buteyk, at different stages of the research, X±m

Stages of the research								
Before classes (I)			In 30 days (II)			In 6 months (III)		
(n)	QCLF, units	Assessment (points)	(n)	QCLF, units	Assessment (points)	(n)	QCLF, units	Assessment (points)
47	5,6±0,34	4,0±0,20	47	7,3±0,37	4,9±0,22	32	6,9±0,28	4,8±0,19
	t; P [I–II]		–	3,38; <**0,01**	3,03; <**0,01**	–	–	–
	t; P [I–III]		–	–	–	–	2,95; <**0,01**	2,90; <**0,01**

Table 2

Average indicators of a short-term visual memory at women of 36-48 years old which were engaged according to P. K. Ivanov's system and a technique of breath of K. P. Buteyk, at different stages of the research, X±m

Stages of the research								
Before classes (I)			In 30 days (II)			In 6 months (III)		
(n)	QCLF, units	Assessment (points)	(n)	QCLF, units	Assessment (points)	(n)	QCLF, units	Assessment (points)
113	5,7±0,38	4,1±0,22	113	7,3±0,33	5,0±0,23	66	7,0±0,30	4,9±0,20
	t; P [I–II]		–	3,18; <**0,01**	2,83; <**0,01**	–	–	–
	t; P [I–III]		–	–	–	–	2,69; <**0,01**	2,69; <**0,01**

Table 3

Average an indicator of function of attention at men of 39-54 years old which were engaged on P. K. Ivanov's system and a technique of breath of K. P. Buteyk, at different stages of the research, X±m

Stages	(n)	Attention					
		A, units	B, units	QMi, units	SR, con. units	Cc, con. units	Ke, con. units
Before classes (I)	(47)	57,2±2,83	51,7±2,93	9,5±1,68	0,48±0,023	0,90±0,025	0,43±0,026
In 30 days (II)	(47)	66,4±2,11	65,2±2,88	4,3±1,39	0,55±0,016	0,98±0,013	0,54±0,019
In 6 months (III)	(32)	64,3±1,98	63,9±2,53	4,5±1,42	0,54±0,017	0,99±0,017	0,54±0,021
t; P [I–II]	–	2,61; <**0,05**	3,29; <**0,01**	2,38; <**0,05**	2,50; <**0,05**	2,84; <**0,01**	3,42; <**0,01**
t; P [I–III]	–	2,06; <**0,05**	3,15; <**0,01**	2,27; <**0,05**	2,10; <**0,05**	2,98; <**0,01**	3,29; <**0,01**

Table 4

Average indicators of function of attention at women of 36-48 years old which were engaged on P. K. Ivanov's system and a technique of breath of K. P. Buteyk, at different stages of the research, X±m

Stages	(n)	Attention					
		A, units	B, units	QMi, units	SR, con. units	Cc, con. units	Ke, con. units
Before classes (I)	(113)	55,9±3,08	49,6±2,97	7,6±1,47	0,46±0,031	0,88±0,024	0,41±0,029
In 30 days (II)	(113)	64,6±2,64	62,3±2,67	2,5±1,32	0,54±0,018	0,96±0,017	0,52±0,018
In 6 months (III)	(66)	63,9±2,40	60,5±2,39	2,7±1,37	0,53±0,014	0,99±0,022	0,52±0,021
t; P [I–II]	–	2,14; <**0,05**	3,18; <**0,01**	2,58; <**0,05**	2,23; <**0,05**	2,72; <**0,01**	3,22; <**0,01**
t; P [I–III]	–	2,05; <**0,05**	2,86; <**0,01**	2,44; <**0,05**	2.06; <**0,05**	3,38; <**0,01**	3,07;<**0,01**

Table 5

Distribution of men and women on indicators of somatic health (G. L. Apanasenko's express method, 1992) at different stages of the research, %

Level of health	Men			Women		
	I (n=47)	II (n=47)	III (n=32)	I (n=113)	II (n=113)	III (n=66)
High	–	–	–	–	–	–
Above an average	–	4,3	12,5	–	0,9	4,5
Average	34,1	57,4	55,6	15,0	75,2	62,1
Below an average	48,9	38,3	31,9	60,2	23,9	33,4
Low	17,0	–	–	24,8	–	–

Note. *The first stage (I) – to carrying out classes, the second (II) – in 30 days, the third (III) – in 6 months after classes.*

level of physical health.

Conclusions

The long-term researches concerning influence of improving trainings with use of nonconventional methods are conducted (Porfiry Ivanov's system and breath ccording to K. P. Buteyk's method) allow drawing such conclusions:

1. That functions of memory and attention are in direct dependence on the level of development of highly genetically determined properties of the main nervous processes as it is possible to learn about it from the researches of V. M. Makarenko, V. S. Lizogub (2011), use of the above-mentioned methods, promotes the reliable improvement of mental functions at people different in age and a physical state.

2. The use of the improving system of Ivanov in combination with a breath method according to Buteyk promotes the increase of level of physical health. The last is estimated by reserves of bio-energetics organism (G. L. Apanasenko's method).

3. The above-mentioned points to the expediency of use of the system of P. K. Ivanov and the method of breath according to K. P. Buteyk in practice of a physical recreation for the purpose of improvement of different segments of the population.

Prospects of the subsequent researches

Carrying out the research in the direction of studying of influence of trainings by hardening according to the system of P. K. Ivanov is planned for the development of the main nervous processes at people of different age in the subsequent.

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Influence training process program for coach physiological quality of players 10–12 years

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The practice of sport shows with proper evidence-based construction training process, not all young athletes can achieve high-level sports technics that puts them at further sporting destiny.

Purpose: *identify the dynamics of psychophysiologic preparations young players aged 10–12 years.*

Material & Methods: *analysis and synthesis of the literature; pedagogical testing laboratory method; methods of mathematical statistics.*

Results: *significant difference in evaluating the capacity for predicting the situation in the field: between 10 and 11 years – on 0.16 points (t=3,57; p<0,001) and between 11 and 12 at 0.27 points (t=2,99; p<0,05). In 11-year-old young players improved 0,79 points relative to 10-year (t=2,30; p<0,05), and 12 years 1.09 points respectively to 11 years (t=4,12; p<0,001). Retrieved changes in terms Tapping test from 10 to 12 years (t=3,15; p<0.01), due to a higher physical activity (both in terms of employment and volume load).*

Conclusions: *with age, physiological indicators improved significantly.*

Keywords: *young players, physiological properties, tests.*

Introduction

The functional condition of the nervous system and its parameters are the main background for the motive activity [1; 2; 5; 20]. It is known that the psychophysiological status of a sportsman plays a large role in the organization of the adequate answer in game sports to which the high level of psychoemotional pressure and concentration of attention are inherent [4; 6; 8; 10].

Skill of a football player is defined by the sum of many qualities which provide the high level of game endurance, coordination of movements, accuracy, operational thinking. A sportsman with the high level of mental preparedness and indicators of the personality corresponding to its, has an advantage at identical qualifications, levels of physical qualities, technical and tactical preparedness, [4; 5; 8; 12–14; 16].

Practice of sports activity shows that not all young sportsmen can reach the high level of sports skill even at a competent evidence-based creation of the educational and training process, a natural elimination of sportsmen takes place [21; 22].

Some stop playing sports, others stop at the level of classes by physical culture, mass sport, and only the small part of sportsmen achieves high-class results, because of the fact that the level of modern sport demands from sportsmen of special abilities for the effective implementation of the competitive activity [17; 19].

Decision-making at football players depends on the efficiency of information processing and its use for performance of the special motive activity [3; 16]. So, the progress of tactical activity of football players considerably is defined the main properties of attention at them by the high level of the development [5; 7; 9].

Thus, the definition of influence of classes by football on a psychophysiological condition of young football players is important.

Communication of research with scientific programs, plans, subjects

This work was performed by a subject: 2.3. «Scientifically-methodical bases of improvement of the system of training of sportsmen in football taking into account features of the competitive activity» of the Built plan of the research work in the branch of physical culture and sport for 2011–2015 (No. of the state registration is 0111U001722) and by the initiative subject of the RW of the department of football and hockey of Kharkiv state academy of physical culture for 2011-2015 2.6. «The optimization of the educational and training process of football players of different qualification» (No. of the state registration is 0111U003127).

The purpose of the research

To define dynamics of psychophysiological qualities as a result of classes by the program of CYSS.

Material & Methods

The following methods were used in the research: analysis and synthesis of references; pedagogical supervision, laboratory method; methods of mathematical statistics [9].

The research has been conducted on the basis of children's football club «Arsenal» Kharkiv, in which 24 football players of 10-12 years old have taken part. The tests of psychophysiological preparedness were carried out four times before the first circle (8/28/2013), after the first circle (11/23/2013), before the second circle (3/27/2014) and after the end of the second circle (6/5/2014) of the superiority of Kharkiv on football.

Results and discussion

The analysis of results of testing which are presented in tab. 1 confirms the improvement of psychophysiological indicators with age at young football players.

Changes in indicators of ***speed of reaction to a sound*** and visual signal, reactions with a choice and on mobile object have a positive character, but they are insignificant and doubtful (p>0,05) (pic. 1).

So, the improvement of speed of reaction to a visual irritant between football players of 10 and 11 years old makes 0,089 s (t=0,44; p>0,05), between 11 and 12-years old – 0,025 s (t=0,15; p>0,05) (pic. 1).

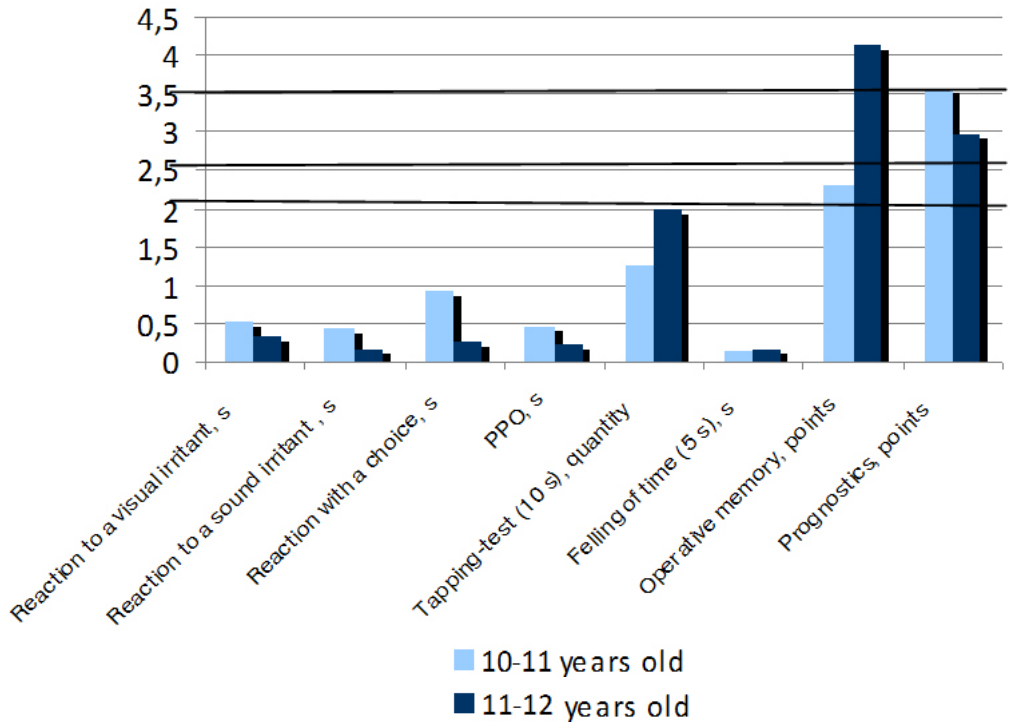
The difference in indicators of speed of reaction to a sound irritant between football players of 10 and 11 years old is defined in 0,08 s (t=0,54; p>0,05), between 11 and 12 years old – 0,025 s (t=0,32; p>0,05) (pic. 1).

The difference between football players of 10 and 11years old makes 0,053 s (t=0,92; p>0,05), between 11 and 12 years old – 0,015 s (t=0,25; p>0,05) in reaction speed indicators with a choice.

Table 1

The comparative analysis of psychophysiological properties of football players of 10-12 years old during trainings (n1=n2=n3=24)

№	Indicator	Age of sportsmen, years old: 10	11	12
		$\bar{X}_1 \pm m_1$	$\bar{X}_2 \pm m_2$	$\bar{X}_3 \pm m_3$
1.	Reaction to a visual irritant, s	0,394±0,14	0,314±0,11	0,289±0,12
2.	Reaction to a sound irritant , s	0,413±0,25	0,324±0,12	0,271±0,11
3.	Reaction with a choice, s	0,565±0,040	0,512±0,041	0,497±0,043
4.	PPO, s	0,371±0,5	0,341±0,4	0,328 ±0,4
5.	Tapping-test (10 s), quantity	22,4±1,25	24,3±0,85	27,3±1,28
6.	Felling of time (5 s), s	0,31±0,012	0,29±0,015	0,26±0,011
7.	Operative memory, points	2,32±0,27	3,11±0,21	4,2±0,16
8.	Prognostics, points	0,37±0,04	0,53±0,02	0,62±0,03



Pic. 1. Numerical values of t-criterion and reliable levels (p) of indicators of special physical fitness of young football players of 10-12 years old (n1=n2=n3=24)

Table 2

Matrix of statistical reliability of indicators of the tapping-test of football players of 10-12 years old (n1=n2=n3=24)

Age	10		11		12	
	t	p	t	p	t	P
10		*	1,25	**>0,05**	3,18	**<0,01**
11	–	–		*	1,97	**>0,05**
12	–	–	–	–		*

The difference between football players of 10 and 11 years old makes 0,03 s (t=0,46; p>0,05), between 11 and 12 years old – 0,013 s (t=0,22; p>0,05) in indicators of speed of reaction to a mobile object (pic. 1).

The difference between football players of 10 and 11 years old makes 0,02 s (t=0,12; p>0,05), and between 11 and 12 years old – 0,03 s (t=0,18; p>0,05) in indicators of feeling of time (pic. 1).

The reliable difference in tapping-test indicators isn't also determined between football players of 10–11 and 11–12 years old (p>0,05), significant improvements have taken place at that time for the entire period of researches (from 10 to 12 years old) (t=3,15; p<0,01) (tab. 2).

Operative memory of young football players of 11 years old has improved on 0,79 points concerning to 10 years old (t=2,3; p<0,05), and next year (12 years) – on 1,09 points (t=4,12; p<0,001) (tab. 3).

Indicators of young football players have authentically improved during the estimation of ability to prognostics of a situation in the field: between 10 and 11 years old – on 0,16 points (t=3,57; p<0,001) and between 11 and 12 years old – on 0,27 points (t=2,99; p<0,05) that is explained by more increased volumes of physical activity (both by the number of classes, and by volume loading).

Table 3

Matrix of statistical reliability of indicators of operative memory and ability to prognostics of football players of 10-12 years old (n1=n2=n3=24)

Age	10		11		12	
	t	p	t	p	t	P
10		*	1–2,30 2–3,57	**1–<0,05** **2–<0,001**	1–5,99 2–6,93	**1–<0,001** **2–<0,001**
11	–	–		*	1–4,12 2–2,99	**1–<0,001** **2–<0,05**
12	–	–	–	–		*

Note. *1 – operative memory, 2 – ability to prognostics.*

Conclusions

1. Psychophysiological indicators authentically improve with the age in estimation of ability to prognostics of a situation in the field: between 10 and 11 years old – on 0,16 points (t=3,57; p<0,001), and between 11 and 12 years old – on 0,27 points (t=2,99; p<0,05).

2. Operative memory of football players of 11 years old young has improved on 0,79 points concerning to football players of 10 years old (t=2,30; p<0,05), and in 12 years – on 1,09 points in comparison with 11 years old (t=4,12; p<0,001), changes in tapping-test indicators from 10 to 12 years old are revealed (t=3,15; p<0,01) that is explained by more increased volumes of physical activity (both by the number of classes, and by volume loading).

Prospects of the subsequent researches

The definition of psychophysiological indicators is compliant to each role of football players from 10–12 years old.

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Hydrocolonotherapy ankle joints after injuries

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Purpose: *to improve efficiency of gydrokinesitherapy by means of specially designed devices and monolasts for patients after ankle joint injuries.*

Material & Methods: *there are pedagogical methods, clinical and radiological methods, anthropometric measurements and goniometry were used.*

Results: *the author's technique of hydrokinesitherapy with application hydrokinesimechanotherapy device in the program of physical rehabilitation which provides optimum conditions for the recovery process was developed.*

Conclusions: *the specially designed hydrokinesomechanotherapeutic device and monolasts are allow strictly controlled movement in all planes of the ankle joint, which contributes to the acceleration of the recovery; the conducted anthropometric and goniometric studies were indicate more rapid elimination of edema, increase movement amplitude, carries opposition to the development of contractures and muscle atrophy.*

Keywords: *ankle-joint injure, physical rehabilitation, hydrokinesotherapy, hydrokinesomechanotherapeutic device, monolast.*

Introduction

Fractures, which are connected damages of intershin – 10,5%, make 60% in the structure of injuries of a talocrural joint (G. S. Yumashev, 1990; O. M. Myatiga, 2004). The desirable result isn't always achieved, despite of an application of modern methods of conservative or operational methods of treatment of fractures with the use of means of physical rehabilitation. A significant amount of complications in the form of contractures, rigidities, muscular atrophies, flat-footedness, violations of the arch of foot, support ability of the injured extremity, gait is observed. The combination of these factors can result in disability which arises almost in half of patients at heavy breaks of a talocrural joint [2; 3; 5; 6; 13–15]. It is proved that desirable results can be achieved at use of devices of mechanic-therapy in the water environment which principle of actions is based on biomechanical features of movements in joints and properties of water. However the existing mechanic-therapeutic devices not completely provide the movements in water inherent in a talocrural joint which reduces the efficiency of a hydrokinesotherapy and process of renewal. Therefore the development of new hydromechanical devices which are capable to provide the mobility volume in a joint, to reduce post-traumatic motive complications, not to allow invalidization of a person is relevant not only from the medical but also social and economic point of view.

Communication of the research with scientific programs, plans, subjects

The work is performed according to the plan of the research work of NNIFK of A.S. Makarenko Sumy state pedagogical university of MES of Ukraine for 2007-2011 by the subject "Theoretic-methodological and organizationally-methodical problems of health, physical rehabilitation and correctional pedagogics" (number of the state registration is 0107U002826), and by the subject "The increase of the level of health and physical fitness of different groups of the population by means of physical culture" (number of the state registration is 0111U005736) for 2011-2015.

The purpose of the research

To increase the efficiency of hydrokinesotherapy by means of specially designed hydrokinesomechanotherapeutic device and monoflippers for patients after damages of a talocrural joint.

Research task:

1. To analyze features of the designs of the existing mechanotherapeutic devices and to define technological shortcomings which influence efficiency of renewal of functions of a talocrural joint.

2. To design hydrokinesomechanotherapeutic device, monoflippers and to develop hydrokinesotherapy technique for patients after damages of a talocrural joint.

3. To estimate efficiency of an author's technique of hydrokinesotherapy with the use of hydrokinesomechanotherapeutic device and monoflippers in the system of physical rehabilitation of patients after damages of a talocrural joint.

Material & Methods

The research was carried out on the basis of the Ukrainian scientific research institute of traumatology and orthope-

dics of AMS of Ukraine (Kiev). We examined 57 persons after damages of a talocrural joint. The contingent of patients was distributed on the main (MG – 29 persons) and comparative (CG – 28 persons) groups. Research methods: pedagogical methods, clinic-radiological data, anthropometrical measurements, goniometry.

Results and discussion

Unsatisfactory results of treatment after fractures are observed in 5–37% of patients among whom nearly a half becomes disabled people (O. Ye. Loskutov, 1990; L. A. Dvoynin, 2002; V. I. Dubrovskyi, 2004). One of the major factors, that allow to reduce undesirable consequences of damages of the SMA and to increase quality of treatment, is physical rehabilitation. The need of application of means of physical rehabilitation for complex treatment after fractures is proved by the theory and practice (M. V. Kornilov, E. G. Gryaznukhin, 2004; A. V. Maglyovany, 2006; S. M. Popov, 2006; V. M. Bogolyubov, 2007; V. P. Murza, V. M. Mukhin, 2015).

Some authors distinguish hydrokinesotherapy (HKT) from means of physical rehabilitation as a powerful factor in the prevention and elimination of morphofunctional violations after removal of an immobilization. At the same time according to V. I. Dovgan, S.B. Temkin, 1981; O. F. Kaptelin, 1986; H. F. Riegler, 1987; L. I. Fisenko, 2005, the efficiency of application of physical exercises in water raises on condition of use a portable mechanotherapeutic device. However technological parameters and operating modes of devices which were used by authors not always allow to work differentiated on inherent biomechanical properties to a talocrural joint (TJ).

The use of special mechanotherapeutic devices gives the chance to improve functional results of the recovery process, to reduce the duration of the period of temporary not working capacity, to prevent the development of complications and disability. But not always the technological modes of known mechanotherapeutic devices (block, paperweight, and cylinder objects) allow to influence differentiated and effectively displays of a traumatic illness, the majority of them have only one plane of movements. Among others mechanotherapeutic devices of different modifications are often used (A. s. No. 1773403 USSR, Pat. No. 2033780 RU, A. s. No. 1416123) which not always give the expected results or not adapted for use in water. Shortcomings of devices are:

– impossibility of performance of the passive and actively facilitated movements in TJ from average-physiologic starting positions for the elimination of contractures;
– impossibility of regulation and fixing of a tilt angle in TJ of rather basic surface of foot which doesn't give the chance to carry out accurately dosed movements at early stages of physical rehabilitation;
– absence of goniometric means which allow to carry out monitoring of movements in a talocrural joint.

Despite of shortcomings, some of them provide a complex of passive and active movements, but don't allow fixing accurately average-physiologic situation for performance of frontal movements in TJ and limiting performance of the dosed actively facilitated physical exercises.

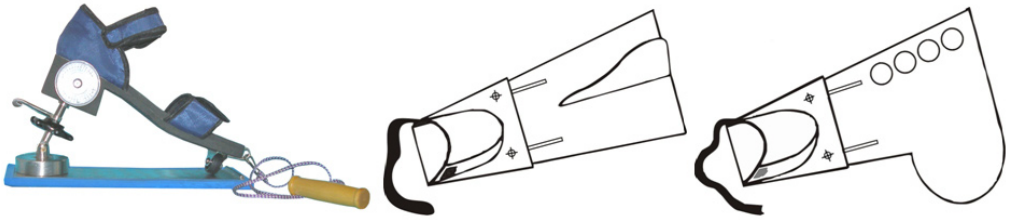
Flippers of different designs are considerably adapted for conditions of the water environment and to performance of movements in all planes. However the majority of them make impossible conditions for performance of exercises with an essential resistance of water in sagital, frontal and horizontal planes, and movements of joints of a back department of foot which reduces efficiency of rehabilitation.

Therefore, technical capabilities of the known devices allow fighting against consequences of fractures, but not capable to provide the differentiated movements with different degree of activity, muscular tension, and possibility of their performance in all planes which are peculiar to joints of a back department of foot.

The analysis of scientifically-methodical literature and practical experience allowed us to develop an author's technique of hydrokinesotherapy in the program of physical rehabilitation with application of specially designed hydrokinesomechanotherapeutic devices (HKMTD) and monoflippers for patients after damages of a talocrural joint. The performance of such physical exercises was its feature: autopassive, active facilitated by means of HKMTD (pic. 1a), active with use of monoflippers (pic. 1b, c), tractions; application to hydromassage in a bathtub «Relax» and the dosed walking in the pool with the different level of immersion.

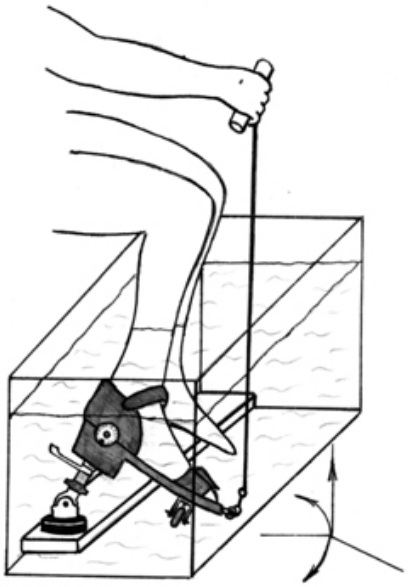
Autopassive exercises in water from the first days of the postimmobilization period were carried out for mobility renewal, tension of hems, prevention of contractures and strengthening of the copular device TJ (pic. 2).

The patient was consistently suggested executing the movements of bending extension in sagital and inversions-aversion of foot in the frontal planes by means of a flexible draft. Loads of the operated extremity increased gradually due to the formation of a right or acute angle between foot and a longitudi-



a) b) c)

Pic. 1. Author's devices for the development of a talocrural joint:
a – hydrokinesomechanotherapeutic device;
b – monoflippers for movements in the frontal and sagital planes;
c – monoflippers for movements in the sagital plane.



Pic. 2. Hydrokinesomechanotherapeutic device for the development of a talocrural joint

nal axis of a shin. The initial angle reached by means of goniometer and the HKMTD constructive elements which made 40–45˚. Gradually this corner was reduced to 10-15º with elimination of pain and increase in amplitude of movements.

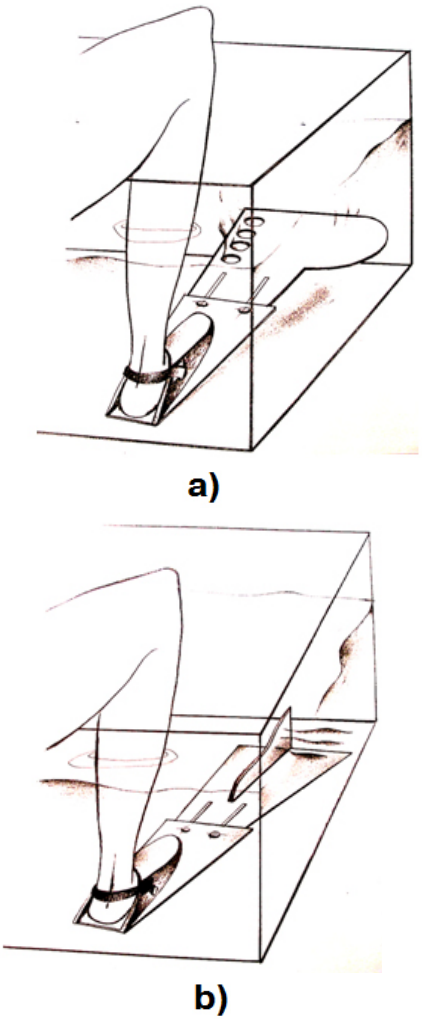
The autopassive movements were carried out at slow speed, with gradual finishing amplitude of movements to the greatest possible. At the end of each movement the short delay to easy painful feelings with the sufficient force of external action was carried out, at the same time exercises were carried out with the prolonged exhalation phase. The number of repetitions of each exercise – 18–20 times.

The active facilitated exercises were a transitional chain between autopassive and active free exercises. They began with movements in the frontal plane (inversion-aversion) by means of the built-in roller in the nasal part of the device and muscular effort. Loads of the damaged segment of the lower extremity during a performance of the offered physical exercises was dosed by means of different tilt angles of a foot from 40º to 10º, the angle is smaller, and the bigger loading is. The angle was established which answered 10-15º for the reduction of pain at the end of each movement and achievement of a certain level of fitness. The number of repetitions of each exercise – 14–16 times, speed is slow, amplitude incomplete, and breath is any. During a performance of exercises, the movements were limited which repeated the trauma mechanism, severely adhering to a certain tilt angle of a foot.

We used monoflippers for the increase in power load of shin muscles: monoflippers for movements in the sagital plane; monoflippers for movements in the frontal and sagital planes (pic. 3a).

The author's technique of hydrokinesotherapy with use of specially designed monoflippers to movements in TJ was applied in a complex of rehabilitation actions after the education of a secondary bone callous:

a) monoflipper for movements in the sagital plane; s.p. – sitting on a side to the pool, legs are shipped in water to knees:



Pic. 3. Monoflippers for rehabilitation of TJ:
a – monoflippers for movements in the sagital plane;
b – monoflippers for movements in the frontal and sagital planes.

bending extension in TJ, a knee joint; features of a design of a monoflipper provided tension of the joint-copular device on the one hand of TJ, and strengthening of muscles from the opposite side; change of position of the rowing blade of a monoflipper on 180º caused a opposite effect of action on tissue;

b) monoflipper for movements in the frontal and sagital planes; s.p. – the same that in the point "a": bending extension, inversion-aversion in joints of a back department of foot; features of a design of a monoflipper provided strengthening of muscles, the accuracy and coordination of performance of movements which promoted stabilization articulate and the copular device of TJ and increase of an support ability of an extremity.

Physical exercises were carried out on average speed, with incomplete amplitude, the number of repetitions of 20-25 times at the beginning of the training period, speed, amplitude and the number of repetitions (40–50 times) increased gradually at the end.

Hypostases of soft fabrics of foot and lower third of a shin, succulence of its forward surface, manifestation of an at-

rophy of muscles, restrictions of volume of movements in TJ and violation of a gait were observed before the beginning of application of hydrokinesotherapy for sick of both groups. Phys-rehabilitation actions were already applied to sick of both groups before carrying out during this period anthropometrical and goniometric researches. But sick of MG were engaged according to individually developed program of physical rehabilitation [3], and sick of CG by the standard techniques [4; 8; 13; 15–17]. Therefore results of a difference of the contoured sizes of separate segments of the lower extremity for the 50th day after the operation had reliable differences between indicators of MG and CG where conditionally the best indicator was observed at sick of MG. There weren't reliable differences between indicators of MG and GP by the results of the goniometric measurements during this period, and indicators of volume of the movements of TJ remained low with sick of both groups.

Measurement of the contoured sizes of separate segments of the injured extremity was shown reduction of hypostases at sick of both groups. At the end of the rehabilitation course the difference of the contoured sizes of the TJ at sick of MG made 0,4±0,04 sm, the lower third of a shin – 0,3±0,03 sm, an average third of a shin – –0,17±0,03 sm, and in CG – respectively 1±0,04, 0,8±0,03 and –0,74±0,03 sm. The fact of reduction of hypostases and hypotrophy of muscles of sick of MG in comparison with sick of CG is statistically reliable ($p<0,001$).

The final result of measurement of volume of active movements in a talocrural joint and a joint which is above a heel of sick of both groups showed that they changed positively in comparison with the initial level (pic. 4).

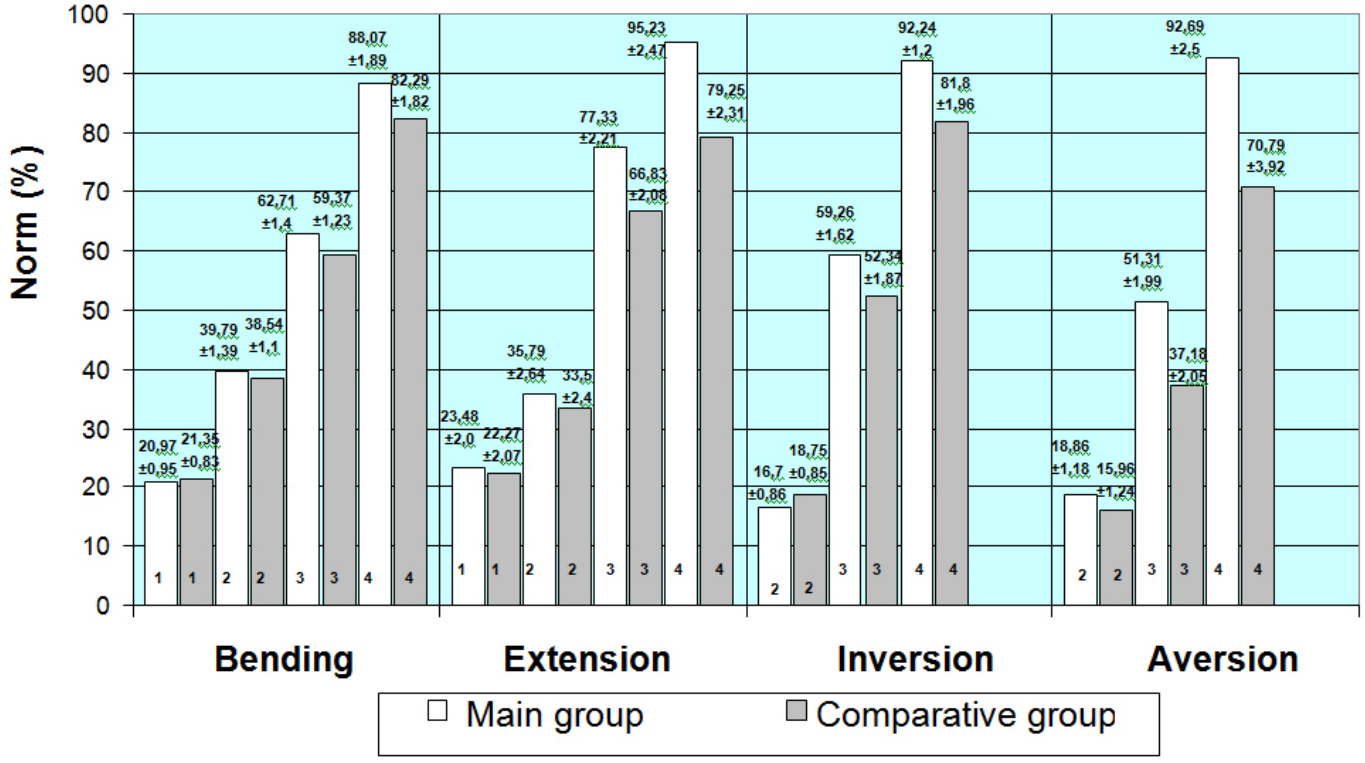
Despite of the positive dynamics of increase in volume of active movements, its incomplete renewal was observed at patients with the heavy complicated changes, difficult reconstructive operations, bigger traumatism of tissues, intra articulate and adjacent to TJ, associated diseases. The bigger quantity of sick of CG, in which the worst result of rehabilitation was observed, probably is connected with not carrying out autopassive exercises by means of HKMTD and non-use of a monoflipper of sagital movements for the alternate, differentiated action on lateral and medial parts of a talocrural joint.

Conclusions

1. The features of designs and technical parameters of functioning of the existing hydromechanotherapeutic devices don't ensure the movements in the planes of a talocrural joint characteristic of its natural biomechanical properties that influences efficiency of hydrokinesotherapy.

2. The hydrokinesomechanotherapeutic device and monoflippers, which allow carrying out severely dosed movements in all planes of joints of a back department of foot, are designed and the technique of their use in the complex recovery process is developed.

3. The conducted anthropometrical and goniometric researches demonstrate the acceleration of elimination of hypostases, increases in amplitude of movements; counteract of the development of contractures and an atrophy of muscles. The difference the contoured sizes between the injured and healthy extremity made 0,4±0,04 sm at the level of the TJ seg-



Pic. 4. Dynamics of indicators of volume of active movements in a talocrural joint and a joint which is above a heel of the injured extremity (in percentages):

1) the 5th day after the operation; 2) the 50th day after the operation; 3) the 70th day after the operation; 4) the 5th month after the operation

ment, the lower third of a shin – 0,3±0,03 sm, an average third of a shin – 0,17±0,03 sm, and patients have groups of comparison – respectively 1±0,04, 0,8±0,03 and – 0,74±0,03 sm that indicates the fact of a bigger reduction of hypostases and hypotrophy of muscles in the first, than secondly ($p<0,001$). The amplitude of active movements in a talocrural joint and a joint which is above a heel of the injured extremity approached a norm in both groups, however the number of patients of the main group who managed to renew almost completely until the end of the rehabilitation course mobility, was 1,2 times more, than in the group of comparison. The volume of movements of bending made 88,07±1,89% from a norm, extension, – 95,23±2,47%, inversion – 92,24±1,2%, aversion – 92,69±2,5% at the first one; at the second – respectively 82,29±1,82, 79,25±2,31, 81,8±1,96 and 70,79±3,92% from a norm.

4. Positive results of approbation in practice of the author's technique of hydrokinesotherapy with application of hydrokinesomechanotherapeutic device and monoflippers in the recovery process allow recommending its for use in the system of physical rehabilitation of patients after damages of a talocrural joint.

Prospects of the subsequent researches

Is are considered by us in studying of the efficiency of application of designed hydrokinesomechanotherapeutic device and monoflippers at sports injuries of a talocrural joint.

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Importance of early physical rehabilitation in improving functional state of vegetative nervous system of women with postmastectomy syndrome

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Purpose: *to determine the expediency of early application of physical rehabilitation to improve the functional state of vegetative nervous system of women with postmastectomy syndrome.*

Material & Methods: *theoretical analysis of scientific and methodical literature, analysis of heart rate variability, methods of mathematical statistics. The study involved 135 women with postmastectomy syndrome who underwent radical mastectomy for Madden.*

Results: *at the end of the research value of high-frequency component of the spectrum was significantly higher in women* MG_1 *compared to MG on 257,72 msl (p<0,01) and the stress index was lower on 107,01 c. u (p<0,001).*
Conclusions: *the feasibility of early rehabilitation intervention to improve the functional state of the autonomic nervous system is not detected during the year classes on problem-oriented programs.*

Keywords: *postmastectomy syndrome, women, autonomic nervous system, exercise, physical rehabilitation.*

Introduction

Continuous improvement of medical advances in cancer increases the number of patients that are formally due to lack of progression of breast cancer are considered «healthy», but the presence of complications caused by conducted aggressive anticancer therapy increases with the duration of the postoperative period, which requires active intervention by the rehabilitators [1; 2; 6].

Top randomized feasibility studies show early detection and correction of complications of the musculoskeletal system, cardiovascular and nervous systems for the timely overcome them and improve the quality of life of women of this nosology [7–9]. However, the overwhelming focus on the part of medical rehabilitation, the development of modern medical schemes providing, implementing reconstructive plastic surgery, unfortunately, does not pay enough attention to the physical rehabilitation of patients with postmastektomy syndrome, including the improvement of the functional state of the autonomic nervous system.

The above definitely indicates the importance of developing, conducting and determine the usefulness of timely rehabilitation measures to improve heart rate variability in women with postmastektomy syndrome.

Relationship with the academic programs, plans, themes. The selected research direction corresponds to the research topic of Zaporizhzhya National University "The development, experimental testing and implementation in practice the measures of physical rehabilitation to improve the health status of different categories of people" (state registration 0114U002653) and Lviv State University of Physical Culture "Basis of physical rehabilitation of women with the postmastektomy syndrome" (state registration 0114U007008).

Purpose: to determine the expediency of early application of physical rehabilitation to improve the functional state of vegetative nervous system of women with postmastectomy syndrome.

Material & Methods

The article used the following methods: theoretical analysis of scientific and methodical literature, analysis of heart rate variability, methods of mathematical statistics.

To evaluate the functional state of the autonomic nervous system using electrocardiographic complex KARDIOLAB (National Aerospace University of electronic medical devices and technologies «HAI-MEDICA», Kharkiv, registration certificate № 6037/2007, conformity certificate № UA-MI/2p-2765-2009). Technology of analysis of heart rate variability (HRV) was based on registration short records (5 minutes) the patient's electrocardiographic signal with further analysis of the mathematical methods rytmohramy [5]. We investigated the total variability parameters (SDNN, RMSSD, AMo, Si, IVR) and periodic components of heart rate variability (TP, VLF, LF, HF, LF/HF, IC, LF%, HF%, VLF%). The study was conducted on the basis of Zaporizhzhya Regional Oncology Center.

The study involved 135 women with postmastektomy syndrome (50 patients had stationary and clinical stages of rehabilitation, 85 – only dispensary), the average age was 60,27±0,79 years. In the stationary stage, women were divided into two groups: main group (MG), n=25 and the comparison group (CG), n=25; in dispensary stage – the first main group (MG_1), n=45 and the second main group (MG_2), n=40

according to its own wishes and encouragements to studies on personality-oriented program of physical rehabilitation. Previously, women had held a conversation in which given a clear explanation of the features sessions on each of them.

The first complex personality-oriented program [4] included: aquafitness (aquamotion, akvabilding, aquastretching), conditioned swimming, recreational aerobics (first main group and main group); second [3] – conditioned swimming and Pilates (second main group and comparison group).

Women of the main groups involved in the relevant programs during the year, efficiency controled in six months. Admission to the sessions provided by oncologist, patients of these groups belonged to the third clinical group. At the beginning of the dispensary stage groups were homogeneous in all parameters of heart rate variability.

Results and discussion

To determine the feasibility of early application of physical rehabilitation to improve the functional state of the autonomic nervous system in women with postmastektomy syndrome on dispensary stage of rehabilitation, we conducted a comparative analysis of HRV in six months and year after classes of personal-oriented program of physical rehabilitation (Tab. 1).

The benefits of early physical rehabilitation, it has not been established in six months of classes on the first personality-oriented program between the main group that began rehabilitation with a stationary phase and the first main group – from the dispensary, as evidenced by the presence of probably the best indicators of heart rate variability in the last.

Specifically mentioned stress index (Si) was lower in women MG_1 at 101,69 c. u. ($p<0,01$) compared to the MG, and activity level of the parasympathetic regulation higher on 5,42 ms ($p<0,05$), indicating that lower tension of regulatory systems in women who started on the dispensary stage of rehabilitation. Going on the second personality-oriented program had similar trend benefits to improve the functional state of the autonomic nervous system, including the value of stress index (Si) was lower in women MG_2 on 174,56 c. u. ($p<0,001$) compared to the CG, and the percentage contribution of a very low range component was higher on 12,92% ($p<0,01$), indicating a better adaptive capacity of the autonomic nervous system in the second main group of women.

At the end of the study, the level of parasympathetic regulation of heart rate was significantly higher in women MG_1, as evidenced by higher values of high-frequency component of the spectrum (HF) – on 257,72 msl ($p<0,01$) and (RMSSD) – on 9,56 ms ($p<0.001$), the value of stress index was lower on 107,01 c. u. ($p<0,001$) compared to CG.

A similar was traced when comparing two other groups for the first half, including stress index values were lower in women MG_2 compared to CG on 174,56 c. u. ($p<0,001$), for the second half – on 117,11 c. u. ($p<0,001$).

Conclusions

The results of the study found that developed and tested personality-oriented program of physical rehabilitation of women with postmastektomy syndrome contribute to the improvement of the functional state of the autonomic nervous system of women of all groups, but according to the results of the semi-annual and annual control has been shown to lack feasibility of early rehabilitation intervention on improvement in cardiac rhythm.

Prospects for further research include determining whether early use of physical rehabilitation to improve functional status of upper extremity among women with postmastektomy syndrome.

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Comparison of heart rate variability (M±m) in women with postmastektomy syndrome on dispensary stage of rehabilitation

Index, units	6 months				12 months			
	MG_1 (n=45)	MG (n=25)	MG_2 (n=40)	CG (n=25)	MG_1 (n=45)	MG (n=25)	MG_2 (n=40)	CG (n=25)
SDNN, ms	27,61±1,33	26,04±1,70	23,36±1,07	23,56±1,24	38,34±1,54	36,64±2,03	26,44±1,19	30,16±2,27
RMSSD, ms	22,62±1,60	17,20±1,37*	17,77±1,05	16,64±1,37	30,96±2,04	21,40±1,82**	20,16±1,08	20,64±2,46
TP, ms l	705,77±71,94	697,68±96,84	547,71±50,36	559,24±58,66	1491,80±122,90	1261,96±142,75	722,36±64,02	992,72±155,40
VLF, ms l	174,28±31,69	268,28±50,51	215,61±30,54	154,88±33,73	450,53±52,62	450,92±64,38	216,73±32,46	247,63±63,03
LF, ms l	262,48±26,47	226,24±40,83	191,61±20,50	195,84±21,83	486,40±46,15	500,84±91,04	297,36±36,43	460,00±92,87
HF, ms l	255,07±31,92	184,64±25,32	125,09±14,74	202,88±27,34°	536,08±73,30	278,36±35,43**	202,23±20,65	278,36±43,89
LF/HF, c. u.	1,80±0,22	1,58±0,32	2,39±0,31	3,34±2,24	1,41±0,18	2,05±0,31	1,89±0,22	1,64±0,19
AMo, %	62,20±2,13	64,48±2,74	64,42±1,82	64,04±2,11	50,00±1,64	50,96±1,66	59,72±1,60	60,28±2,68
Si, c. u.	277,75±19,80	379,44±23,86**	290,72±19,86	465,28±32,15°°°	156,55±11,37	263,56±21,12***	261,05±17,69	378,16±32,80°°
VLF, %	25,08±2,38	37,37±4,61*	38,52±3,02	25,60±3,03°°	31,16±2,41	36,62±3,18	32,31±3,03	24,22±3,57
LF, %	39,04±2,27	31,24±2,93*	35,96±2,38	36,11±3,38	33,11±2,00	37,70±3,24	38,10±2,15	42,48±3,66
HF, %	33,32±2,78	31,38±4,01	22,72±2,21	38,28±2,57°°°	33,73±2,41	25,67±2,72*	28,55±2,22	33,26±3,44

Notes. ** – p<0,05, ** – p<0,01, *** – p<0,001 compared MG_1 and MG; ° – p<0,05, °° – p<0,01, °°° – p<0,001 compared MG_2 and CG.*

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Comparative analysis of special preparedness young water-slalom

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Purpose: *to identify indicators is specially trained water-slalom aged 10–12 years.*

Material & Methods: *methods of theoretical analysis, synthesis and synthesis of information, pedagogical control tests (tests), methods of mathematical statistics.*

Results: *presented materials research performance technical readiness of 60 young water-slalom groups of initial training. A comparative analysis of the results and regulatory requirements, the proposed curriculum for youth sports schools.*

Conclusions: *the results of the study suggest lagging performance testing young athletes behind the standards of the program requirements, indicating insufficient specially trained water-slaloms.*

Keywords: water slalom, research, physical preparedness parameters, young athletes. functional preparedness.

Introduction

On this time from all types of rowing, that is included to the program of the Olympic Games, water slalom in Ukraine is the least studied type of sport. The increase of his popularity in the world makes to organize the training process of sportsmen on all stages of long-term sport improvement, using objective material that got an experimental ground [1, 3].

A main factor that provides realization of individual possibilities a sportsman in water slalom is an optimal construction of training both on the size of the training loading and after the orientation of their action. On the modern stage of development of water slalom it is impossible to ignore the specific sport preparation on the initial stage which lays the "basic foundation" for future sports results [5].

Analysis of the last researches and publications

It is known that the modern system of training in sport of higher achievements causes deep functional changes in activity of all organism of sportsman [8]. Influence of the sport training results in the increase of capacity of sportsmen through the achievement of some level of functioning of certain, for the certain type of activity, systems of organism. It needs perfection of process of preparation due to the rational planning of the educational-training loading, methodically competent use of exercise volume and intensity of training loads [8; 12]. Necessary pre-condition for the achievement of high-class sport skills is a systematic and gradual increase of the special and physical preparedness of young water-slaloms [7; 11]. Importance of realization of different type of control of physical and special preparedness on all stages of long-term preparedness of sportsmen registers in works of next authors [4; 6; 9; 10]. However, mainly a training process passes without sufficient pedagogical control after the rate of increase of motor qualities [2].

The lack of accurate data about the level of development of technical mastery complicate the conduct of scientifically-reasonable training process of water-slaloms and search of the most rational way at the construction of training process. Therefore very actual is a search of ways of perfection of process preparations of sportsmen, the use of that allows considerably promoting the level of development of motor qualities from going in for sports. This research is sent to the exposure of some reasons of low level of mastery of young sportsmen on the basis of study of indexes of the special preparedness of young water-slaloms.

Connection of work is with the scientific programs, plans, themes.

Work is executed in obedience to the Erected plan of research works in industry of physical culture and sport on 2011 - 2015 after the theme of a 2.8 «Perfection of preparation of sportsmen in the separate groups of types of sport».(number of State registration 011U003125).

The purpose of the research

To define the indexes of the special preparedness of water-slaloms in age 10-12.

Research purposes:

1. To define the level of development of the special preparedness of water-slaloms in age 10-12.
2. To compare the obtained data to the normative requirements, offer an on-line tutorial for child-youth sport schools, specialized child-youth schools of Olympic reserve.

3. To conduct the comparative analysis of the got results of estimation of level of the special preparedness and normative requirements of offered the program for child-youth sport schools.

Material & Methods

Research methods:

1. Methods of theoretical analysis, synthesis and synthesis of

information.
2. Pedagogical control tests (tests).
3. Methods of mathematical statistics.

Results and discussion

In researches took participation of 42 boys and 18 girls age of 10-12 that engage in a water-slalom in the sport section of SDYuShOR "Mayak +" of Kharkiv. Identification and evaluation carried out by specially trained standards established for water-slaloms the initial preparation. Testing was conducted on such control indexes: passing of reverse gate (right), passing of reverse gate (left), rowing on a line 100 м., eight of circles for 1 minute. Testing for greater authenticity of results was conducted as competitions. Treatment of testing results came true by means of methods of mathematical statistics. Results of testing of level of the special preparedness of water-slaloms on the stage of initial preparation, and also quantitative and percent comparison of investigational indexes, it is driven to the table 1 and figure 1.

On results comparing of the obtained data to the norms, it is possible to mark that almost in all tests boys and girls showed results worst from set in norms. In rowing on a line on a 100 m test, the results of boys practically do not differ from normative requirements. The lowest results they showed in test eight of circles.

In the test of passing of reverse gate right and left, indexes of boys in present $\bar{X}$ =18,5±0,06 and $\bar{X}$ =20,9±0,9, that on 12% and 14% below, than it is set by the program. The results of girls present $\bar{X}$ =24,3±0,09 and $\bar{X}$ =26,2±1,2, that on 14% and 20% less than it is set by the program. Results of test on a 100 m, for boys present $\bar{X}$ =45±10,3, percent advantage folds 5%. For girls results in this test present $\bar{X}$ =67±13,5, that on 15% less than from programmatic requirements.

In test eight of circles is for 1min boys and girls showed such results $\bar{X}$ =1,5±5,71 and $\bar{X}$ =0,8±3,56, that on 25% and 36% less than from normative requirements.

Specifies the got values of coefficient of variation (V) on heterogeneous development of the special preparedness for young water-slaloms.

On results the analysis of literary sources and own researches by us reasons were educed, insufficient level of the special preparation of sportsmen: incompleteness of scientific-methodical ground of the program of the special preparation of water-slaloms; low level of speed-power capabilities of sportsmen.

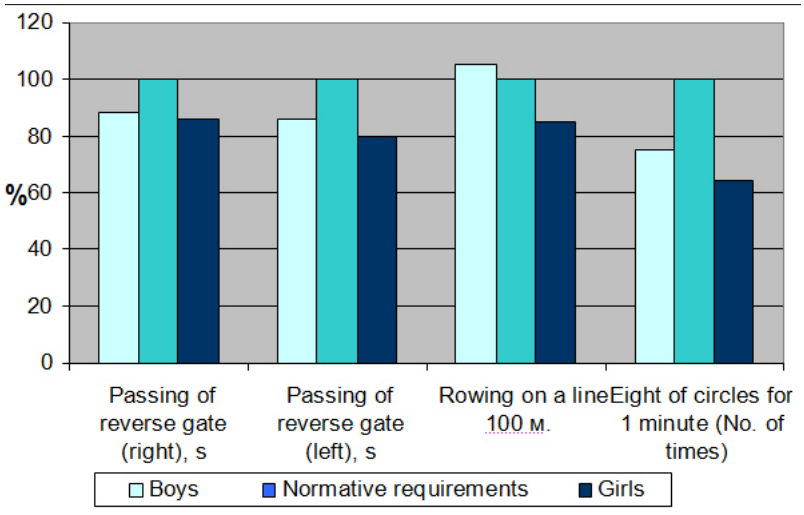
Conclusions

1. The comparative analysis of results of the special preparedness of water-slaloms testifies that on the average the indexes of testing of young sportsmen fall behind from the norms of programmatic requirements, which specifies on the insufficient level of the special preparedness.

Table 1

Indexes of the special preparedness of water-slaloms age of 10–12

Test	Boys (n=42) $\bar{X}\pm\sigma$	V, %	Normative requirements (boys)	Δ, %	Girls (n=18) $\bar{X}\pm\sigma$	V, %	Normative requirements (girls)	Δ, %
Passing of reverse gate (right), s	18,5±0,16	8,2	15	12	24,3±0,19	9,3	18	14
Passing of reverse gate (left), s	20,9±0,9	4,2	15	14	26,2±1,2	6,3	20	20
Rowing on a line 100 м.	45±10,3	10,1	50	5	67±13,5	17,4	55	15
Eight of circles for 1 minute (No. of times)	1,5±0,41	8,1	3–4	25	0,8±0,86	11,6	2-3	36



Pic.1. Percent correlation of indexes of level of the special preparedness of young water-slaloms

2. As a result of research it was educed by us, that some indexes of tests exceed norms, namely: in test a 100 m. for boys advantage makes 5%. In all other tests results were below from normative requirements. Most lag of boys and girls is educed in test eight of circles of 25% and 36%. In test of passing of the reverse gate left and right, lag of guys folds 12% and 14%, for the girls of lag folds 14% and 20%.

3. Thus, the results of test tests for boys and girls witnessed lag of the special preparedness of sportsmen that participated in research, from normative requirements. These results are not satisfactory and specify on a necessity for the prospect of development.

The prospects of further researches

Will be based on development of experimental methodology of training of water-slaloms with an accent on the increase of level of speed-power capabilities and special preparedness.

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The influence of physical activity on life quality formation of elderly people

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Purpose: *to analyze the relationship between various parameters of life quality and physical activity level of older Ukrainian citizens.*

Material & Methods: *150 female aged 65,2±4,3 years were interviewed with MOS SF 36 and IPAQ questionnaire.*

Results: *it is shown the values of scales Emotional role functioning (44,0 points), General Health (51,4 points) and Bodily Pain (52,2 points) can be considered as critical.*

Conclusions*: statistically significant correlation between the numbers of metabolic equivalents used on physical activity during work (study), duration of active recreation was found.*

Keywords: *physical activity, quality of life, elderly people, leisure time.*

Introduction

Thereon the unsatisfactory social and economic conditions of aging of the population of Ukraine are followed by the essential deterioration in health, growth, the number of persons which needs the public and state aid. Understanding of the factors, which provide the formation of quality of life of elderly people, improve wellbeing of the population, promote attraction to the public life, will help to keep labor potential, will reduce financial expenses on the medical and social care and will continue life expectancy of Ukrainians.

The concept «quality of life» actively develops in the different field of science. Some of the known definitions have the general character – «awareness of own wellbeing by a person», «satisfaction or dissatisfaction with own life», «feeling of happiness or misfortune», others are based on objective and subjective indicators, or on the contrary, display only some components of wellbeing [1; 2; 7]. The last most often can be met in works which are devoted to health, physical activity and efficiency of a person.

Researches of the communication between physical culture and sport and quality of life are rather tightly directed. So, somatic health of a person remains the main object of studying. The subject of studying of such scientific researches is the communication between physical culture and sport and physical component of wellbeing, change, as life of different groups of the population which provide long-term sports and improving projects, which are specialized programs for rehabilitation of persons with sharp or chronic diseases and so forth [2–6; 8–10]. But, the package of questions which concern other aspects of physical culture, sport and quality life of the population is insufficiently reasonable. Among them are– mental health, cognitive abilities and level of physical activity; physical culture, sport, education and employment; trainings by physical culture and sport and prevention of asocial behavior; physical activity, social capital and social inclusion; physical recreation and quality of life and so forth. Studying of the communication between quality of life and physical activity is necessary for the development of the special preventive programs which are directed to the formation of high level of wellbeing of persons of different age.

Communication of the research with scientific programs, plans, subjects

The work is performed according to the basic scientific research at the expense of expenses of the state budget «The involvement of elderly people to sports and improving educational programs for the purpose of improvement of health and quality of life».

The objective of the research

To analyze the communication between different parameters of quality of life and level of physical activity of elderly people.

Material & Methods

150 women of the advanced age, who were students of University of the third age at Lviv state university of physical culture for the 2014–2015 academic years, are interrogated. The age of participants – 65,2±4,3 years old. Data of scientific literature [3–6; 8–10], and also own results, concerning the quality of life of respondents of mature age (450 teachers, age of 24-60 years old) are used for the comparison.
The quality of life, which is connected with health, was studied by means of the questionnaire of MOS SF 36. Indicators of wellbeing according to such scales were analyzed: “Physical Activity” (PA), “A role of physical problems in activity restriction” (RP), “The pain level” (P), “Vital capacity” (VC), “The general state of health” (GH), “Social Activity” (SA), “A role of emotional problems in activity restriction” (RE), “Mental Health” (MH).
The level of physical activity was studied with the use of the International Physical Activity Questionnaire, IPAQ. Energy consumption at work, at home, during movement and in free time was counted separately. The size of physical activity was calculated at MET (metabolic equivalent of task) that

answered the consumption of 3,5 ml of O_2 on 1 kg of weight in 1 min. 3,3 MET, 4,0 MET and 8,0 MET respectively was used on physical activity, insignificant, average and considerable behind power, within 1 min.

Results were studied statistically. The independent among themselves selections were compared to the help of the nonparametric test of Kruskal-Wallis. The correlation analysis was carried out according to Spearman. The differences at a significance value not lower than 95% ($p<0,05$) were considered reliable.

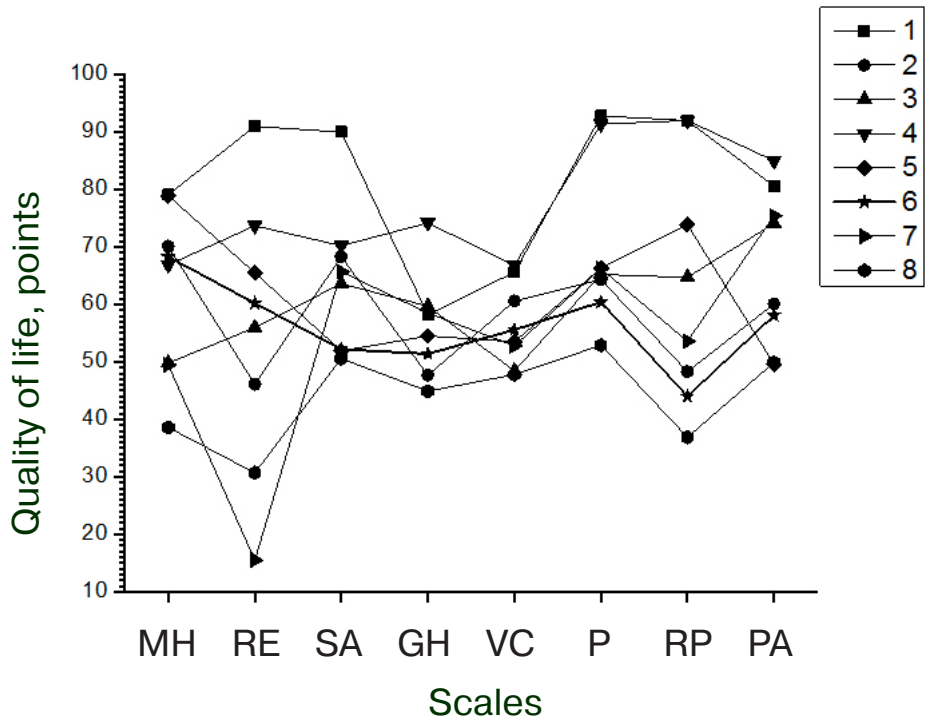
Results and discussion

The quality of life of the Ukrainian respondents was compared to wellbeing of persons who lived in other countries of the world (pic. 1). It is revealed that the existence of sharp and chronic diseases – a major factor which significantly worsens a meaning of quality of life by all scales. So, wellbeing of elderly people after a stroke or at senior patients who have the disease of eyes, which is predetermined by diabetes, is made lower than 50 points by scales «Physical activity», «A role of physical problems in activity restriction», «The role of emotional problems in activity restriction». A meaning of quality of life of the Ukrainian respondents is one of the lowest and commensurable with data of patients with serious chronic illnesses.

But, indicators of wellbeing of residents of the People's Republic of China or the USA are rather high. A meaning by a scale "Physical activity" makes 74–94 points, "A role of physical problems in activity restriction" – 73–95 points. Indicators of scales which correlate with the general mental component ("Mental health", "A role of emotional problems in activity restriction") make over 85 points. The exception can be considered results for a group of persons which are in specialized institutions. The senior people, who need a continuous examination, have low meanings according to all scales of quality of life. Indicators of wellbeing are in range of 36,9-52,9 points, in particular, a meaning of the "Role of emotional problems in activity restriction" parameter (36,9 points) and "Mental health" (49,9 points) are very low.

Results of the poll of the Ukrainian respondents testify to vital issues with a functional state and its restrictive influence on the daily activity. Meanings of wellbeing by the majority of scales are critical: «A role of emotional problems in activity restriction» – 44,0 points, «The general state of health» – 51,4 points, «Pain» – 52,2 points. But, indicators of scales «Mental health», «Social activity», that «Vital capacity» is higher and make 58,1 points, 60,4 points and 55,6 points, respectively. Low indicators which characterize the general mental to a component of wellbeing of elderly people and also its separate parameters, in particular, a meaning by a scale «Mental health» (58,1 points), «A role of emotions in daily activity» (44,0 points), «Social activity» (60,4 points) testify about certain negative welfare tendencies in the Ukrainian society – a negative perception of an old age, a restriction of activity of senior persons, their dependence on younger family members and so forth.

Physical activity of adult respondents was analyzed at work



Pic. 1. Quality of life of elderly people:
1 – citizens of the People's Republic of China (age >60 years) [4]; 2 – respondents from the People's Republic of China (age >55 years, suffer on a diabetic retinopathy) [8]; 3 – respondents from the USA (age – 77 years, problems with hearing) [10]; 4 – respondents from the USA (age – 78 years) [6]; 5 – respondents from Poland (age – 45–65 years) [9]; 6 – respondents from Ukraine (age – 65 years, own data); 7 – citizens of Sweden (age – 74 years, patients after a stroke) [3]; 8 – respondents from Iran (age – 60 years, patients who are in specialized institutions for elderly people and need continuous examination) [5].

(on study), at home, a plant area during rest and movement from one place to another. All kinds of physical work which they performed within the last week asked to remember participants of the research. Respondents of a mature age at work spent 45,6% of total of Met-year/week, during a movement – 11,5%, houses (in particular, on a plant area) – 32,5%. These meanings made 30,9%, 19,9%, 36,8% respectively at elderly people. The senior respondents in off-duty time spent 12,4% of total of metabolic equivalents for physical activity, and respondents of a mature age – 10,4%. Differences in absolute meanings of the given indicators were observed. In particular, the general level of physical activity at persons of a mature age made 283,1±20,2 MET-year/week, at elderly people – 179,6±15,8 MET-year/week.

Correlation coefficients, insignificant and average by size between quantities of the metabolic equivalents are found, which were spent for a physical activity during work (study), movements, at home, in free time and quality of life (tab. 1). The greatest meanings are characteristic of parameters physical activity at work and scales «Physical activity» (r=0,48), «Social activity» (r=0,54) and «Mental health» (r=0,43), activity which is connected with a movement and an indicator «The general state of health» (r=0,71).

Physical activity of at home, it is similar as well as spending of free time passively, or long sedentary work influences negatively some components of quality of life. So, negative correlation connections are found for the parameter "Physical activity of the house" and scales "Pain" (r=–0,34), "A role of emotional problems in activity restriction" (r=–0,41), "Mental health" (r=–0,51); "Time, carried out sitting" and "Physical activity" (r=–0,28), "A role of physical problems in activity restriction" (r=–0,41), "Social activity" (r=–0,34). But, the growth of duration of active recreation is connected with the increase in quality of life of elderly people. Reliable correlation connections are found for the meaning of scales "Physical activity" (r=0,63), "A role of physical problems in activity restriction" (r=0,58), "The general state of health" (r=0,35), "Social activity" (r=0,51), "A role of emotional problems, in activity restriction" (r=0,41), "Mental health" (r=0,49).

Conclusions

The quality of life of elderly Ukrainians is low, indicators of scales «A role of emotional problems in activity restriction» (44,0 points), «The general state of health» (51,4 points), «Pain» (52,2 points) are possible to consider critical. The majority of indicators are commensurable with the data of respondents of the advanced age who live in other countries of the world and have chronic diseases.

The statistically reliable and average by size coefficients of correlation between quantity of the metabolic equivalents are found, which are spent for physical activity during work (study) and meanings of scales, «Physical activity» (r=0,48), «Social activity» (r=0,54) and «Mental health» (r=0,43), and also the activity which is connected with a movement and an indicator «The general state of health» (r=0,71). The quality of life of elderly people depends on a duration of active recreation – correlation coefficients for scales «Physical activity», «A role of physical problems in activity restriction», «The general state of health» (r=0,35), «Social activity», «A role of emotional problems, in activity restriction», «Mental health» were in range of 0,41-0,63.

Prospects of the subsequent researches

Consist in introduction of sports and improving projects for elderly people that will promote the formation of skills which are necessary for healthy lifestyle that, in turn, will positively influence the quality and duration of life.

Table 1

Correlations between quality of life and level of physical activity of elderly people

Parameters according to the International questionnaire for the determination of level of physical activity	Scale of quality of life							
	MH	RE	SA	GH	VC	P	RP	PA
Physical activity:								
at a work (during a study)	0,48*	0,34*	0,02	0,32*	0,41	0,54*	0,01	0,43*
connected with movement	0,12	0,13	0,34	0,71*	0,39*	0,20	0,34*	0,11*
at home (on a plant area)	0,42*	0,13*	–0,34*	–	–	–	–0,41*	–0,51*
in free time	0,63*	0,58*	0,11	0,35*	0,11	0,51*	0,41*	0,49*
Time of spending, sitting	–0,28*	–0,41*	–0,19	0,14	–	–0,34*	–	0,31

Note. "*" – a reliable correlation, p<0,05

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Characteristic of passes of ball games team qualifications

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Purpose: *to define quantity and efficiency of passes in games of participating teams of world championship 2014.*

Material & Methods: *analysis of scientific-methodical literature, registration of technical-tactical actions, methods of mathematical statistics. The study of competitive activities was conducted with participating teams of world championship 2014.*

Results*: the article shows the quantitative and qualitative indicators of passes in games of high teams qualification.*

Conclusions: *the total of passes of the commands executed by football players in games of world championship 2014, it varies in the range from 242 to 819 where average value is 499,7 passes. Victorious teams surpass losers teams almost in all the quantitative and qualitative indicators of passes.*

Keywords: *ball passes, penalty area, half of a field, efficiency of passes.*

Introduction

The analysis of technical and tactical indicators of the competitive activity in football is considered in two aspects – all-command [8; 13; 14] and individual (on game roles) [2; 3; 12].

Indicators of technical and tactical actions of football players of different qualification are rather fully reflected in works [4; 10].

The analysis of games of the strongest teams of the world allowed experts [1; 5; 15] to plan the following tendencies on which it is possible to lean at an assessment of technical and tactical preparedness of football players.

So, the main mean of conducting a game for the leading teams of the world are passes: their approximate contribution to the sum of TTA makes 56–60%. A flaw when performing short and average passes shouldn't be more than 20%, forward back and across – 10%; when performing long passes a flaw shouldn't exceed 30–45%.

So, as a result of the conducted researches [7] it was established that teams-participants of the World Cup of 2014 carried out 500 passes on average for a game. At the same time the quantity of passes at teams on the WC-2014 varied from 242 till 819 passes.

Results of the research demonstrate that winner teams carried out 532,8±20,2 passes on average for a game, and teams which lost – 493,7±13,4.

The analysis of the competitive activity of teams of the championship of Ukraine demonstrates [5] that field players carry out 261 passes on average for a game that makes 35,8% of all TTA. Respectively: short passes make 121 (16,5%), average passes – 92 (12,6%), long passes– 48 (6,6%). The second indicator in a total amount of TTA are ball stops – 164 (22,5%). That is 58,3% of all TTA are the share of passes and stops of a ball on average.

Researches of individual TTA of football players of different qualification allowed establishing [11] that football players of a team of a premier league made 42 short and 5 long passes on average for a game. Football players of the first league carried out 33 short and 9 long passes on average for a match. Football players of the second league of the championship of Ukraine carried out 27 short and 6 long passes on average for a game.

Results of other researches [6; 9] demonstrate that from 900 till 1000 actions with a ball are on matches of a high level from which 350 passes in two and more contacts and 150 – in one fall.

These data are confirmed by results of other researches [10] in which it is noted that the team "Metallist" of Kharkov in games of Cup of UEFA of 2008-2009 was carried out by 108 passes in one contact (attacking 50,6, constructing 57,4) on average for a match. At the same time football players of the team of "Metallist" made 14,4 passes in a defense zone, in an average zone – 77,4, in an attack zone – 16,2.

The objective of the research

To define the quantity and the efficiency of passes in games of teams-participants of the World Cup of 2014.

Material & Methods

The competitive activity of teams-participants of the World Cup of 2014 was researched. Research methods: analysis of scientific and methodical literature, registration of technical

and tactical actions, methods of mathematical statistics.

Results and discussion

From the tab. 1 it is visible that teams in the World Cup of 2014 made 499,7±10,2 passes on average for a game. More often teams applied average passes – 299,7±7,5 (59,4±0,4%). 123,6±3,1 (25,0±0,4%) were short passes, 76,5±1,3 (15,9±0,3%) – long.

The results, which are presented in the table, demonstrate that teams had the unequal efficiency of performance of different passes. So, the efficiency of short passes made 76,4±0,6%, average passes – 79,6±0,6%, long – 56,5±0,9%. At the same time the efficiency of total of passes made 75,2±0,6%.
From the tab. 2 it is visible that the quantity of passes in a penalty area of the rival at teams-participants of the WC-2014 varied in the range from 3 till 42, with an average 18,6±0,7. At the same time efficiency of transfers to a penalty area varied from 0 to 50%, at an average of 22,3±1,0%.

As a result of the conducted researches it was established that on personal and others' half of the field significant differences had the efficiency of passes (t=25,8; p<0,001). So, the

Table 1

Quantitative indicators of short, average and long passes of teams-participants of the WC-2014

Indicators	Quantity	Specific weight, %	Efficiency, %
Total of passes	499,7±10,2	100,0±0,0	75,2±0,6
Short passes	123,6±3,1	25,0±0,4	76,4±0,6
Average passes	299,7±7,5	59,4±0,4	79,6±0,6
Long passes	76,5±1,3	15,9±0,3	56,5±0,9

Table 2

Quantitative and quality indicators of passes of teams-participants of the WC-2014

Indicators	Minimum meaning	Maximum meaning	On average for a game
Total of passes	242	819	499,7±10,2
Short passes, quantity	59	246	123,6±3,1
Average passes, quantity	122	545	299,7±7,5
Long passes, quantity	50	114	76,5±1,3
Passes in a penalty area of the rival, quantity	3	42	18,6±0,7
Efficiency of passes of a ball, %	56	89	75,2±0,6
Efficiency of short passes, %	57	90	76,4±0,6
Efficiency of average passes, %	59	92	79,6±0,6
Efficiency of long passes, %	37	81	56,5±0,9
Efficiency of passes in a penalty area of the rival, %	0	50	22,3±1,0
Efficiency of passes on the half of the field, %	73	98	90,8±0,4
Efficiency of passes on others half of the field, %	49	91	70,0±0,7

Table 3

Quantitative and quality indicators of passes of the won and lost teams

Indicators	The won teams	The lost teams	t	p
Total of passes	532,8±20,2	493,7±13,4	1,61	>0,05
Short passes, quantity	131,5±5,7	125,1±4,8	0,86	>0,05
Percent of short passes, quantity	24,6±0,5	25,3±0,5	0,99	>0,05
Average passes, quantity	320,4±14,3	293,8±9,5	1,55	>0,05
Percent of average passes, quantity	59,5±0,5	59,2±0,6	0,38	>0,05
Long passes, quantity	81,0±2,2	74,8±1,8	**2,18**	**<0,05**
Percent of long passes, quantity	15,8±0,5	15,6±0,5	0,28	>0,05
Passes in a penalty area of the rival, quantity	18,7±1,5	20,0±1,0	0,72	>0,05
Efficiency of passes, %	75,9±0,9	74,7±0,8	1,00	>0,05
Efficiency of short passes, %	77,1±0,9	76,0±0,7	0,96	>0,05
Efficiency of average passes, %	80,2±0,8	79,0±0,8	1,06	>0,05
Efficiency of long passes, %	57,6±1,4	55,2±1,3	1,26	>0,05
Efficiency of passes in a penalty area of the rival, %	23,5±1,5	21,9±1,4	0,78	>0,05
Efficiency of passes on the half of the field, %	91,3±0,6	90,5±0,7	0,87	>0,05
Efficiency of passes on others half of the field, %	71,7±1,2	68,3±0,9	**2,27**	**<0,05**

efficiency of passes on the half of the field was ranging from 73 till 98%, at an average of 90,8±0,4%. At the same time, the efficiency of passes on others half of the field varied from 49 till 91%, at an average of 70,0±0,7%.

Quantitative and quality indicators of passes of the won and lost teams-participants of the WC-2014 are presented in the tab. 3.

These tables demonstrate that teams-winners almost surpassed teams which lost in all quantitative and quality indicators. However the reliable distinctions are revealed only in indicators of quantity of long passes (t=2,18; p<0,05) and efficiency of passes on others half of the field (t=2,27; p<0,05).

Conclusions

As a result of the research it was established that teams-participants of the World Cup of 2014 made 499,7±10,2 passes on average for a game, at the same time teams used average passes more often – 299,7±7,5 (59,4±0,4%), at the efficiency of total of passes of 75,2±0,6%.

Prospects of further researches

Further researches will be devoted to studying of passes in games of the European championship of 2016.

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Determining the background for implementation of sports-oriented teaching techniques in training of children age of 5–6 years old under the conditions of a preschool educational establishment

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Purpose: *to identify and substantiate the necessity of the implementation of physical training elements and sports games in education of late preschools.*

Material & Methods: *the analysis of scientific-academic literature and regulatory documents, polling, survey, pedagogical observation, test execution.*

Results: *the attitude toward sports-oriented physical training is based on the analysis of children's attitude to their sporting activities as well as of their parents and of personnel at pre-school institutions. This article provides the results of children's motor skills assessment and reveals the necessity of implementation of sports-oriented physical training to the educational experience at pre-school educational institutions. pedagogical observation, test execution.*

Conclusions: *a poor physical health leads to the implementation of physical training technologies and sports games in teaching process at pre-school institutions as an alternative to traditional physical training techniques is the most effective way to motivate preschools to exercise which has a great impact on children's health and well-being.*

Keywords: *pre-school education, sports oriented technologies, children of late pre-school age.*

Introduction

The current state of health of preschool children causes a big concern. Results of various researches testify to the available tendency of deterioration in indicators of health of children and teenagers in Ukraine. The role of physical education increases considerably in the system of preschool education under such circumstances. But the traditional system of physical education not completely satisfies requirements of versatile development of a children's organism, fills emotionally classes on physical culture which pushes on need introduction of the innovative sports focused technologies in the teaching-educational process of preschool educational institutions for the purpose of improvement of the system of work with children.

It is noted in paragraph 1.3 of the article of the I International charter of physical education and sport that special conditions need to be provided to youth, including *children of preschool age*, to elderly people and persons with physical or intellectual defects for the purpose of all-round development of their personality by means of the programs of physical education and sport which are adapted for their requirements [13].

The works of many domestic and foreign scientists are devoted to introduction of achievements of sports science for the solution of methodological problems of physical education, including preschool.

The special place is taken by the concept of conversion of the chosen elements of sports education which is developed by V. K. Balsevich [3] for the benefit of improvement of contents and forms of the organization of physical education at comprehensive schools and preschool educational institutions.

L. V. Volkov [5] developed the program of sports game preparation which (for the purpose of optimization of physical education of children of 5-7 years old) provides use of various methods and means of performance of physical exercises by game and sports game methods. The maintenance of means of training influence and technological model of selective size of physical activity are developed.

L. I. Lubysheva [12] considers sportization as an active use of sports activity, sports technologies, competitions and elements of sport in the educational process for the purpose of formation of sports culture of pupils.

Sports lifestyle, according to N. E. Pangelova [14], is one of the priority directions in physical education for the harmonious development of the identity of a preschool child.

Yu. Babachuk [2] gives the characteristic of maintenance of motive actions of games with sport elements; I. Surinov and Z. Varfolomeyeva [16] pay a considerable attention to sports game activity as means of the Olympic education of the senior preschool children.

Now the wide circulation together with the term «sports training» was received by terms «physical training» (E. Myakinchenko, V. N. Seluyanov, 2000), «improving training» (T. A. Kravchuk, 1996; V. G. Bugrov, 1999), and in physical education of children of preschool age some authors operate with terms «classes of the training direction» (E. N. Pimonova, A. M.

Voropayev, 1989), «training classes» (M. A. Runova, 2000).

According to L. D. Glazirina, V. A. Ovsyankin [6], a competitive method can be included in the study process of movements of children, but a teacher needs to know how to make it. Everything depends on pedagogical skill of tutors. For example, such questions: «Who can better do?», «Who will bring quicker a «jack at a pinch?" set the purpose before a child - it is a methodical technique of a competitive method.

Researchers O. L. Boginich, Yu. M. Babachuk [4] developed a methodical textbook «Outdoor games and game exercises with elements of sports for children of the advanced preschool age».

Various latest technologies of physical education which include track and field athletics exercises will promote formation of a correct posture, beautiful gait, development of coordination of movements, and also improve physical fitness of a child [11].

O. D. Dubogai, N. V. Makovetska [7] consider that application of rhythmical gymnastics and dancing therapy in the educational process of a preschool institution is expedient.

M. Aleksandrovska [1], I. Kuzina [10], I. Tereshchenko [17] assign a significant role in the system of physical education to rather new look – step-aerobics (to use of a step-ladder as a mean of the development of coordination of movements at preschool children).

That is, a positive influence of introduction of achievements of sports science in teaching and educational process of preschool educational institutions is implicit, but this fact not always finds support from parents and tutors of preschool educational institutions.

The purpose of the research: to analyze and prove need of introduction of elements of sports training and sports in physical education of children of the advanced preschool age in the conditions of a preschool institution.

Research task:

1. To analyze scientifically-methodical literature and normative documents concerning introduction of the innovative sports which are oriented technologies in teaching and educational process of preschool institutions.

2. To carry out the analysis of medical cards of children of the studied groups.
3. To find out the relation to sports oriented physical education of children of the senior groups, their parents and tutors.

Material & Methods

The following methods were used in the course of the research: theoretical analysis of scientifically methodical literature, pedagogical supervision, poll, questioning.

Results and discussion

The research on the bases of preschool institutions of Lutsk and Kiev was conducted for obtaining objective data of influence of sports focused physical education on formation at children of motives and incentives to classes by physical culture and sport. 80 senior preschool children who were created in groups (40 persons – control, 40 – experimental) took part in the research. Classes with children of the control group were carried out according to the Basic program, and in the experimental group elements of sports training and sports were applied on classes in physical culture and during walks.

Results of the analysis of medical cards confirm the existence of tendency of deterioration in a state of health at children of the advanced preschool age (tab. 1).

It is noted by the results of medical examination that 47,5% of children of the first group of health in the control group, 42,5% – the second from which 65% of children the main to classes by physical culture and 35% – preparatory. 42,5% of children of the first group of health in the experimental group, 57,5% – the second, from which 57,5% of children the main to classes by physical culture and 42,5% – preparatory.

That is, the main attention during classes with children of the advanced preschool age is necessary to pay to children of the second main group and the second preparatory group («risk group»).

Negative tendencies of deterioration in a state of health of modern children induce to pay special attention to quality of physical education of preschool children. The main priorities have to be: the development of new, most adequate programs, the search of the most effective techniques in physical education of the senior preschool children, introductions of elements of different types of sport for the benefit of improvement of contents and forms of the organization of physical education in preschool educational institutions.

Work with parents and tutors included at itself questioning, lectures and individual conversations. Poll of parents and pedagogical workers of children's institutions were carried out for the purpose of specification of the place and a role of sports focused physical education in teaching and educational process. As a result we increased the level of knowledge and interest of parents in education at children of values of

Table 1

Indicators of medical examination of children of the senior groups (September), n=80

Groups	Group of health				Group of physical education			
	I		II		Main		Preparatory	
	n	%	n	%	n	%	n	%
C (n=40)	19	47,5	21	52,5	26	65	14	35
E (n=40)	17	42,5	23	57,5	23	57,5	17	42,5

the Olympic Movement. Polls of children were conducted by means of parents (for bigger reliability of results).

Sports, elements of sports training, exercise of sports character, which are already adapted by scientists for use in sports focused physical training of the senior preschool children, were offered for carrying out the research.

The number of children was evaluation criterion, who visits sports sections at the beginning of the research, and information, about what sports sections were chosen for classes by children and their parents at the end of the research, and also results of poll of children before and after the termination of the research.

340 parents, 180 tutors of PEI of Lutsk and Kiev answered the question of questionnaires. Results of the poll of parents indicated the positive relation to classes of their children by physical culture for the sports focused program: 96% (326) parents have the positive relation, 4% (14) – hesitated in connection with the lack of information on the matter. That is, the vast majority of parents agree with introduction of elements of different types of sport to the program of physical training of PEI and expressed desire that to put them were brought up according to the Olympic education from preschool age when the socialization of the personality begins.

And a little other situation is observed at the poll of tutors: 47% (84) – prefer as the traditional system of physical education of the senior preschool children, 53% (96) – support introduction sports focused physical education of the senior preschool children.

That is, the desire of parents isn't supported by a half of the interrogated tutors that in turn indicates unavailability to cardinal changes in physical education of children of the advanced preschool age of pedagogical personnel of preschool institutions.

The poll of tutors found requirement to introduction in practice of work of children's preschool institutions of the latest technologies on physical education due to additional methodical classes, both in the conditions of PEI, and at advanced training courses which will give an opportunity to increase efficiency of physical training of children and to improve their health, will give an opportunity to better prepare children for school.

External selective observations were made for the purpose of identification of need of children of the advanced preschool age to classes with elements of sport which the main purpose was diagnostics of a situation which provided non-interference to the process which is studied [8].

Younger pupils came to a preschool institution for carrying out joint walks by the invitation of administration (in which carrying out pedagogical experiment was provided). Children of the elementary grades were suggested playing with kids sports on their discretion, and to the senior preschool children to take part in these games.

The supervisions over children of the experimental groups were carried out both during walks in a preschool institution, and during walks outside a kindergarten. The senior preschool children were willingly connected to pupils of the elementary grades which played football, basketball and other sports.

By the results of supervision it is possible to draw a conclusion that practically all children (boys and girls) seized the offered sports game during 2–3 general games. That is, the senior preschool children created skills of performance of the main physical exercises (run, jumps, throwing but other) which gives the chance to children rather quickly to seize different sports by the simplified rules.

For more effective planning of classes, regulation of dispensing of loading, pedagogical supervision and control, children of the senior groups were distributed on subgroups during classes.

Not only an age and a sex, but also indicators of physical development, a state of health were considered during an assessment of physical training of children by a complex of quick tests.

Especially remarkable is that children of the senior groups independently organized games during a day and evening walks which they have acquired during the general games with younger school students. It is possible to note with confidence what children of the advanced preschool age willingly play sports what they seized, not depending on a sex.

The poll of children of the experimental group about their relation to the sports offered by pupils, easy mastering and interest in studying and assimilation of new games indicates interest of children to classes of a competitive character that provided us the bases for introduction of the sports focused technologies in physical training of children of the advanced preschool age.

By the results of the research it is possible to draw a conclusion that acquaintance of children of the experimental group in the course of classes in physical culture with different types of sport, elementary skills of performance of exercises of sports character, forms resistant interest in sports activities. And, on the contrary, children of the control group had an insignificant interest to sports activities (tab. 2).

Results of the poll of children of control and experimental groups concerning desire to be engaged in sports sections demonstrate that generally it was sports which were used in the teaching and educational process of a preschool institution.

Children of the experimental group expressed desire to be engaged: football – 57,5%, hockey – 20%, basketball – 32,5%, floorball – 70%, track and field athletics – 50%, gorodki – 15%, gymnastics – 40%, tennis – 22,5%, acrobatics – 35%.

Children of the control group would like to be engaged in the following sports: football – 27,5%, basketball – 15%, track and field athletics – 35%, acrobatics – 7,5%; gorodki – 17,5%, gymnastics – 5%.

Interest of children in such sports which aren't in the program of physical training, speaks: oriental martial arts – revision of television programs and desire, generally boys, to be able to protect themselves (control groups – 40%, experimental – 30%); figure skating – visit of children with parents of skating rinks (experimental – 10%); cycling – most of children have bicycles and in free time (outside a children's institution) willingly ride bikes (control groups – 22,5%, experimental – 30%).

Table 2

Indicator of interest of children sports at the end of the research (%)

Groups	Kinds of sport											
	Acrobatics	Basketball	Cycle racing	Gymnastics	Gorodki	Track and field athletics	Floorball	Oriental martial arts	Tennis	Figure skating	Football	Hockey
C (n=40)	7,5	15	22,5	5	17,5	35	–	40	–	–	27,5	–
E (n=40)	35	32,5	30	40	15	50	70	30	22,5	10	57,5	20

Results of the poll of parents of children of the experimental groups concerning classes of children in sports sections at the beginning of the research the following: 37,5% (15) parents for sports, from them 10% (4) – sent children to sections of gymnastics and football; 62,5% (25) parents consider that to play sports at such age early. At the end of the research: 82,5% (33) parents for sports, from them 30% (12) – sent children to sports sections (football, gymnastics, acrobatics, oriental martial arts, swimming); 17,5% (7) parents consider that to play sports at such age early (pic. 1).

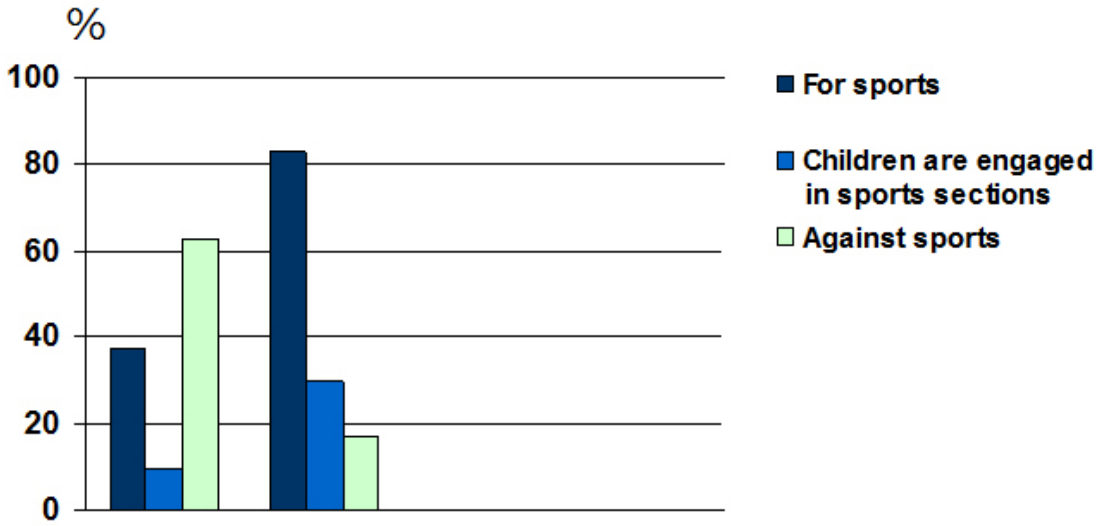
Conclusions

1. The analysis of scientifically methodical literature testified that introduction of the innovative sports focused technologies is one of the priority directions of the improvement of contents and forms of the organization of physical education in preschool educational institutions.
2. The results of the analysis of medical cards confirm the existence of tendency to deterioration in state of health at children of preschool age. The main attention is necessary pay on children of the second main group and the second preparatory group during classes with children of 5-6 years old («risk group»).

3. Results of the poll, the questioning indicate the positive relation of children, parents to introduction of the sports focused technologies in physical education of children of the advanced preschool age.

Prospects of the subsequent researches

Will be connected with more detailed studying and the subsequent introduction of elements of sports training in physical education of the senior preschool children, and also studying of influence of sports focused physical training at choice of boys and girls of sports for classes in sports sections.



Pic. 1. Indicators of the poll of parents of children of the experimental groups at the beginning and at the end of the research of %

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Use motion games in exercise with children with bronchial asthma

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Purpose: *to analyze the possibility of using moving games in the rehabilitation of children with bronchial asthma.*

Material & Methods: *the modern scientific literature on integrated prevention and treatment of children with asthma.*

Results: *A high frequency of morphological and functional deviations at children with asthma. Classification and examples of mobile games, which can be used for this group of children.*

Conclusions: *the results of modern research that show the effectiveness the use of physical rehabilitation, including moving games.*

Keywords: *bronchial asthma, physical rehabilitation, motion games.*

Introduction

The significant increase in prevalence of bronchial asthma (BA) at children, difficulties of diagnostics and possibility of development of heavy, invalidizational forms of a disease, predetermine a special relevance of a problem in modern conditions. BA – is the most widespread disease of a children's age. Boys are ill more often, than girls (6% in comparison with 3,7%), however the frequency of a disease becomes identical in both sexes with the approach of the pubertal period. BA observe at city dwellers more often, than at rural (7,1% and 5,7% respectively). A disease proceeds heavier at children from families with the low social status [6].

In 2011 at the meeting of the UNO on non-communicable diseases – Ncds) the attention was concentrated on the increase in threat of BA and other noninfectious diseases of global health, social wellbeing and economic development. BA usually develops in the early childhood. Signs of BA can disappear in more than in 3/4 of children in whom symptoms of asthma appeared till 7 years old, at an adequate complex treatment till 16 years old [2].

In this situation the search of safe is very actual, but enough effective methods and ways of therapy of BA, especially at a rehabilitation stage. For today methods of non-drug and traditional therapy began to be used rather widely in clinical practice. These methods of influence pathogenetic are proved, they are combined with medicamentous therapy, harmless, allow avoiding polypragmasy, are psychologically well transferred by patients, help renewal of the broken functions of an organism [9].

For today the solution of questions of prevention of bronchial asthma is important. Now there are no prenatal actions which could be recommended for primary prevention of BA [6].

Post-natal prevention provides carrying out the following actions: to recommend the chest bringing up which has a protective effect concerning emergence of whistling rattles at children of early age; the warning of parents-smokers of negative influence of a tobacco smoke on the course of diseases which are followed by bronchial obstruction.

Actions for the secondary prevention are focused on children in whom the existence of a sensitization is proved, but there are no symptoms of BA yet.

The tertiary prevention is directed to reduction of influence of provocative factors for control improvement of BA and reduction of need for medicamentous therapy.

Especially perspective prevention of BA at children who visit the children's organized collectives, which are located in the polluted industrial regions or in territories with adverse ecological conditions and enter into the risk group concerning the development of allergic diseases.

Introduction of the multicomponent system of medico-pedagogical improving actions with inclusion of the alternative methods of influence in child care educational institutions, which are directed to the improvement of a state of health of children including risk groups on the development of bronchial asthma, will allow to solve not only medical, but also socially important problems of use of health care technologies in education of children [9].

The opinion of authors and their colleagues on clinical prospects of physical activity of children with different types of diseases, different degree of their weight is displayed in the book "Health of children and physical activity" of O. Bar-Or and T. Rouland (2009). Authors consider that "… low-mobility practically without options displays an aberration at children which is expressed in physical, mental or emotional violations and social disadaptation" [1].

The disease often leads to reduction of physical activity which provides detraining influence, decrease in functionality of a child and the subsequent prevalence of hypoactivity: "hypoactivity – detraining – hypoactivity – close vicious circle" [1].

Considering physical activity as therapeutic means in physical therapy, work therapy, that is means of physical rehabilitation, it is necessary to consider their positive necessary factor for

growth and development of children, teenagers, causing their full-fledged health, and also reducing development of risk factors of chronic diseases at an mature age [12].

Group of authors (O. N. Kuzina and co-authors, 2015) [5] conducted the research of morfo-functional indicators of an organism of children with atopic BA in the period of clinical remission for the development of criteria of efficiency of basic treatment and rehabilitation of this category of patients. 166 children aged from 3,5 till 15 years sick on atopic BA in a remission stage (113 boys and 53 girls) were examined. All patients were divided into 3 groups in 1 of which 44 preschool children entered; in the 2nd 70 children younger, were included in the third – 52 children of middle school age. The main anthropometrical indicators, force of different groups of muscles, counted indexes were measured: Ruffie, Harvard step-test, Robinson. It was revealed as a result of the researches:

1. Physical development was disharmonious in 53 (31,9%) cases that was generally shown by surplus of body weight; with age the part of these patients grew up from 6 (13,6%) cases in the 1st group to 22 (42,3%) in the third.

2. Indicators of a condition of the muscular system in most of patients, especially at preschool children, were lowered: hand dynamometry in 78 (47%) cases, force of muscles of a back – in 117 (70,5%), a stomach – in 107 (64,5%).

3. High frequency of decrease in separate parameters is registered, which display an initial condition and an adaptive reserve of the cardiorespiratory system.

Being guided by the obtained data by authors which confirm the decrease in force of muscles, disharmonious physical development and a low adaptive reserve of respiratory and cardiovascular systems of children with BA, is expedient to include in the complex treatment of means of physical rehabilitation, in particular, medical physical culture.

Leading experts on physical rehabilitation and pulmonology (S. V. Khrushchov, V. N. Moshkov, M. I. Fonaryev, K. P. Buteyko, V. M. Mukhin, N. A. Geppe, O. V. Peshkova and another) recommend focusing against the all-developing exercises attention on various technicians of breath. But, considering needs of children, V. A. Siluyanova and N. L. Ivanova suggest to enter into the inter-attack period in classes by remedial gymnastics of game of a special orientation, and also elements of sports [4].

According to L. A. Strashk (2011), MPC for patients with bronchial asthma has to become a part of everyday life [10].

The purpose of the research

To learn possibilities of use of outdoor games in rehabilitation of children with bronchial asthma.

Material & Methods

Research methods: the analysis of modern literature and researches, which devoted to use of different means of rehabilitation of children with bronchial asthma.

Results and discussion

Use in pediatrics of medical physical culture as an element of physical rehabilitation allows developing individually the muscular force and physical abilities of children [3].

In the course of physical rehabilitation the approach of remission happens thanks to renewal of own compensatory opportunities of an organism of a patient. Means of physical rehabilitation are ecologically purest and at their correct appendix don't cause complications [9].

It is proved by the researches of certain authors that bad shipping of loadings at children with bronchopulmonary diseases connected with a condition of detraining which develops as a result of an inactive way of life [11].

Means of physical rehabilitation contribute to renewal of function of external breath, normalization of blood circulation, improvement of adaptation opportunities of respiratory and cardiovascular systems, physical activities; strengthening of muscles of a thorax and bronchoalveolar device; increase in mobility of a backbone, ribs, diaphragms; increase of resilience of an organism; improvement of exchange processes; normalization of function of the central nervous system [12].

One of the most effective methods in the motive therapy of patients and the weakened children – outdoor games. They influence favorably the cardiovascular, respiratory systems and the musculoskeletal device [11].

The main form of MPC is classes by the remedial gymnastics (RG) which are recommended to be carried out at the beginning of a rehabilitation course individual, and then low-group and group by methods. From means of MPC are applied: the breathing exercises, all-developing exercises (ADE), special physical exercises, outdoor games of the special and all-developing orientation [7].

Classes by RG consist of 3 parts: preparatory, main and final. 15–20% of the general time are taken away on the preparatory part of classes of RG, on the main part – 65–75%, on final – 10–15%.

Elementary gymnastic exercises are given in the preparatory part of classes of RG which don't need a big physical tension that train a patient for the growing physical activity. It is also possible to include outdoor games on attention which are held on the place, lasting up to 2 minutes.

The main part of classes of RG solves the leading medical tasks and includes the special and all-developing exercises which positively influence respiratory and cardiovascular systems and all organism of children. Exercises are applied to big muscular groups on strengthening of muscles of an abdominal tension, breathing exercises (breathing exercises with a pronunciation of sounds, dynamic breathing exercises with the prolonged exhalation, diafragmalny breath, drainage exercises but other), outdoor games of special and all-developing orientations, Hatha yoga elements. It is also possible to use 1–2 ball games in the main part in which it is necessary to use in transfers which are previously studied in exercises, throwings, dribbling. Duration has to be 5–10 minutes.

Final part: elementary gymnastic and breathing exercises, relaxation exercises, and also elements of autogenic training. It is possible to include to ia an outdoor game with low intensity which will promote a slow decrease in loading and will calm after the emotional excitement [8].

Unlike adults for whom motivation to classes by physical activity is renewal of health, it isn't motivation for children and teenagers. Therefore the program of physical exercises for children needs to be built by the principle of game activity, even with elements of symbolical remunerations after the implementation of the necessary motive program [1].

Game serves satisfaction of different requirements – in self-knowledge and communication, in spiritual and physical development, in rest and entertainment, etc. Different parties of the identity of children appear and develop, many emotional and intellectual requirements are satisfied, character, self-confidence, forces are built up in a game.

Outdoor games – the most available and effective method of influence on a child with her active help. Game exercises take the special place both in physical training of a child, and in treatment, providing complex influence on her organism and high emotionality [4].

Game exercises are divided on outdoor games (on the place, inactive, mobile) and sports.

Requirements to games which are used in rehabilitation of children:

- obligatory regulation of physical activity, according to motive regime of a child;

- possibility of management of the physiologic shifts connected with an emotional coloring;

- fixing of the developed movement skills;

- compliance and realization of the put medical tasks;

- compliance of a game of age of a child.

In view of an insufficiently high level of physical efficiency of children with BA, it is necessary to pay special attention to dispensing. The following receptions are used for regulation of physical and emotional activity on classes: to change the duration and the number of repetitions of a game; to increase or reduce the platform sizes; to apply stock of bigger or smaller weight and sizes; to enter short breaks; to reduce or increase number of teams depending on the number of participants [8].

The cclassification of outdoor games with allocation of 4 groups is accepted in therapy of patients and the weakened children taking into account psychophysical loading in them: I group – games with insignificant psychophysical loading, II group – with moderate loading, III group – with a toning loading, IV group – with a training load [4].

Games on the place and games of small mobility are entered in the post-attack period when physical rehabilitation is carried out in the form of individual and low-group classes. At improvement of a condition of a patient (reduction of frequency of attacks, their duration, decrease in tendency of bronchial tubes to a spasm) elements of sports are connected (volleyball, basketball throwing in a ring and so forth). At the same time the whole loading part of any exercise: trunk inclinations, a ball throw, and so forth is carried out on an exhalation. It is necessary to relax after several repetitions. It promotes increase of adaptation of an organism to growing physical activities, working capacity preservation.

Outdoor games which impose already more considerable requirements to nervous, cardiovascular and respiratory systems [6], are included in remedial gymnastics in the interattck period that are carried out already, as a rule, by a group method.

Outdoor games of a special orientation of N. L. Ivanov offers to divide into 5 groups: I group – with breath correction elements, II group – with elements of drainage of bronchial tubes, III group – with sport elements, IV group – with posture correction elements, V group – with elements of relaxation [4].

Outdoor games with elements of correction of breath solve a task: to promote relaxation of smooth muscles of bronchial tubes, developments of the mechanism of full breath with overwhelming training of an exhalation. «*Summer at the dacha*»: an image of different animals: cows (moo), sheeps (be), goats (me), pigs (oink- oink), bugs (zhzhzh), cats (meow), cocks (cock-a-doodle-doo), toy pistols (uphph). To say each sound 6–8 times. The game for training of an exhalation *"Flight with flowers":* s.p. – straight arms are raised up, palms are connected. The flower extremely reveals – hands in the parties (on an exhalation), the flower smells – a delay of breath, closing of a flower, – return to s.p. (on a breath). *"Festive cake"* – imitation of a a blowout of candles on a festive cake.

Outdoor games with elements of drainage of bronchial tubes help to improve a bronchial permeability and to normalize evacuator function of a bronchial tree. *"Cars"*: s.p. – choldren carry out an emphasis hands in forgery, parents hold them by legs. A child carries out the movement on hands. For children of a middle school age possible performance of this game without the aid of parents, it is necessary to divide them into several teams for this purpose.

Children with BA rather often have violations of a bearing in (most often kyphotic). The correcting outdoor games promote prevention and elimination of postural defects. *"Hit in a skittle by a ball ":* to put in one rank lay down on a stomach, each player has a ball in hands. At small distance opposite to each participant belongs a skittle. A ball push from a breast the skittle needs to bring down a ball. After that a child puts hands on a belt, having raised a breast from a floor, connects shovels – to hold 5 seconds. Then each participant gets up, follows a ball and repeats a task. To execute 5–7 attempts in total. The one who brought down the bigger number of times to a skittle wins. *"Stand up straight":* accept to put in front of the mirror a correct posture and go on the hall a simple step with speed change (slowly, quickly), then turn into run. By a signal of a instructor to put run take the places about a mirror, correctness of a bearing is checked and advice from correction is given if the wrong bearing.

Outdoor games with elements of sport are preparatory to certain sports (basketball, volleyball, track and field athletics,

and so forth). They promote improvement of work of all bodies and systems of an organism, and also breath training. «*Relay with basketball elements*»: the players who are divided into 2 teams and built in columns. By an order of the instructor players of both teams carry out dribbling by one hand, for 2 m to a ring stop, carry out a throw in a ring two hands from a breast on an exhalation. Then catch a ball, and with it in hands run come back to team and pass on baton. The team which all players have quicker executed exercises wins. *"A foot ball"*: players settle down in a circle, in one of them a ball. The pupil who drives comes into a circle. Players roll a ball on a floor each other, seeking to get into the pupil's legs in a circle. If someone manages it, then he changes the player in a circle.

Outdoor games with elements of relaxation help to teach any relaxation of muscles, and also relaxations of muscles of a humeral belt and the top extremities promote. «*Sea waves*»: s.p. – standing in a circle and having joined hands. To carry out hands the wavy movements, weakens at the same time a humeral belt and the top extremities. *"Weeping willow":* s.p. – hands in the parties, legs at shoulder length – a breath. On an exhalation to make an inclination forward, to weaken a humeral belt and hands, then to shake hands diversely, having presented that hands – tree branches, shake on wind.

Conclusions

1. Modern researches of morpho-functional indicators demonstrate a decrease in force of muscles, disharmonious physical development and a low adaptive reserve of respiratory and cardiovascular systems of children with bronchial asthma, therefore are expedient to include in complex treatment of means of physical rehabilitation, in particular, of medical physical culture.

2. From means of MPC are applied: the breathing exercises all-developing exercises (ADE), special physical exercises, outdoor games of a special orientation.

Prospects of the subsequent searches

Are connected with the improvement of programs of physical rehabilitation of children with bronchial asthma for the purpose of the increase of their motivation to physical activity.

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Rationalization of work of leaders of physical-sports organizations

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Purpose: *to create the main ways of rationalization of the work of heads of physical-sports organizations in the structure of their scientific organization of the work.*

Material & Methods: *the content of the administrative activity of representatives of the system of the regional government of the sphere of physical culture and sport of the Kharkov area, and also directors of sports schools of Kharkov (57 respondents) are generalized. Methods – the analysis of references, the organizational analysis, the organizational diagnosis, the poll (questioning), the methods of mathematical statistics.*

Results: *the essence and the content of rationalization of the administrative work in the sphere of physical culture and sport are considered. The integrated approach to certain objects of rationalization of the administrative work is established in physical-sports organizations.*

Conclusions: *the main ways of rationalization of the work of heads of physical-sports organizations are: the organization of work concerning the development of motivational mechanisms of the activity of heads; the increase of the economic appeal of work; the formation of ideology of a healthy lifestyle.*

Keywords: *physical-sports organization, head, administrative work, rationalization*.

Introduction

The modern sports organization is forced to adapt to conditions of market relations and competition, for the purpose of satisfaction of requirements of society concerning the quality of results of its activity. Therefore, factors which define its success in the market at the same time are survival factors. The traditional sports organization has the expressed hierarchy which is focused on control and organizational structure of management with accurately fixed problems of subsections. The sports organization of new type – is focused on the management of processes and human resource management. Therefore the work of the manager is the object of modern researches of the theory and practice of the effective management [4; 8].

The administrative personnel are considered as a decisive factor of preservation of capacity of the organization within new administrative thinking. The sphere of influence on production of the administrative work is much wider, than the work of the workers who are directly occupied in the sphere of production [1; 7; 9].

The effective use of workers of the sphere of physical culture is provided with the system of actions of organizational and legal character which includes: the work regulation on duration and volume; the establishment and observance of qualification characteristics of sports workers; the ensuring of a labor discipline; the creation of necessary working conditions; the professional development of workers, and also the regulation of a salary [2; 3; 5].

A certain place in rationalization of the administrative work is taken by its organization. It provides the rationalization of processes of distribution and labor co-operation, the development of progressive, organizationally-administrative technologies, the improvement of methods of work of management personnel. If to take into account that the basic purpose of the scientific organization of work consists in the increase of productivity of brainwork, then mean is also the rationalization of the administrative work.

Communication of the research with scientific programs, plans, subjects

The research is executed according to the plan of the research work of KhSAPC for 2016-2018, a subject: “Methodological bases of the strategic development of the sphere of physical culture and sport in the region” No. of the state registration is 0113U004615.

The purpose of the research

To create the main ways of rationalization of the work of managers of sports organizations in the structure of their scientific organization of the work.

Material & Methods

The complex of complementary methods was used for the achievement of the purpose: analysis of references, organizational analysis, organizational diagnosis, poll (questioning), methods of mathematical statistics. As a result of the conducted research generally the content of the administrative activity of representatives of the device of regional government of the sphere of physical culture and sport of the Kharkiv region, and also directors of sports schools, Kharkiv (57 respondents).

Results and discussion

The sports organizations play a significant role in the system of social institutions, carry out traditional functions of transfer of knowledge, skills of professional activity, develop erudition and intelligence at youth and define cultural reference points of the future society. Therefore the constant stereotypes in the control system of physical culture and sport shouldn't interfere with the sociocultural principles and aspirations of modern youth to initiative, innovations, full self-realization. The modern sports organizations which function in difficult social and economic conditions need the development of new scientifically-methodical approach concerning the maintenance of components of technology of human resource management. The effective management of personnel of the sports organizations has to answer their accurately certain mission and functional area, to consider changes of internal and external environment, to define adequate methods and receptions, to influence quality of activity. The organizational analysis of technology of management of the studied sports organizations demonstrates that all components of effective management of personnel not always take place in them: planning, picking up and selection, adaptation, motivation, study, advance on service, assessment (67%). Sometimes (30%) their contents doesn't meet requirements of the present.

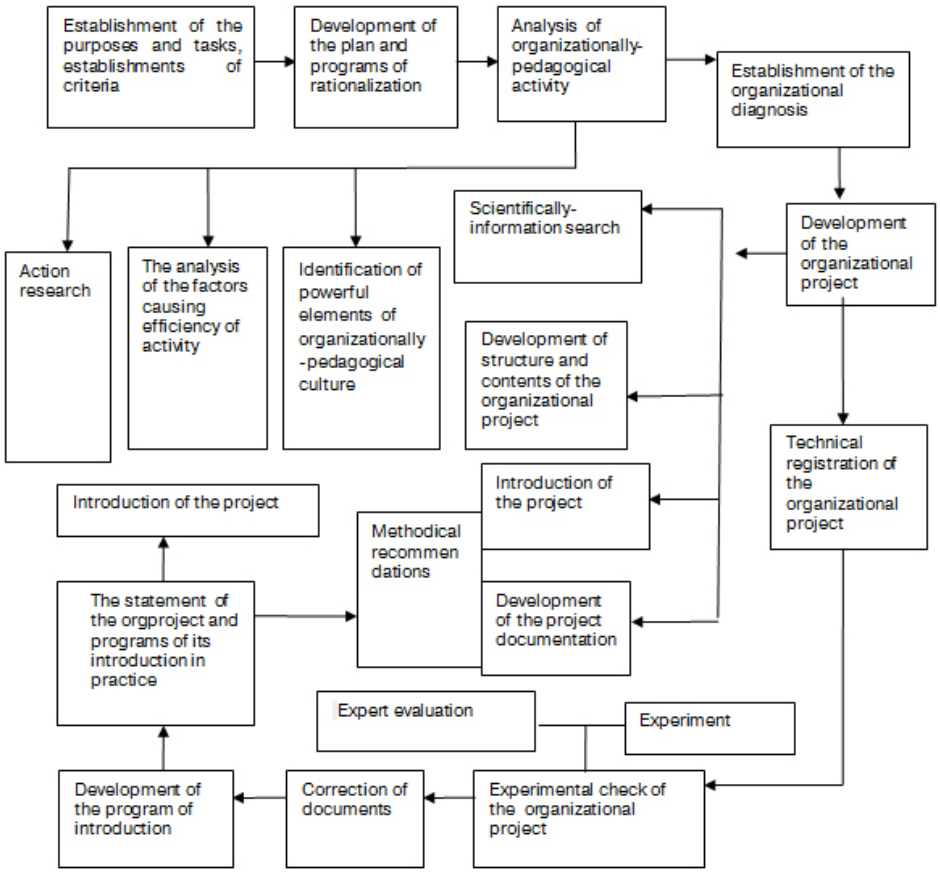
We created the generalized flowchart of organizationally-pedagogical conditions of the effective activity of managers of the sports organizations which followings of algorithm will improve results of the administrative work (pic).

Certainly, any situation is considered correctly as the organizational project in management of the sports organization. This approach allows heads to use technology of management of projects in the professional activity.

In the analysis of conditions of rationalization of the work of the manager it is initially necessary to pay attention of the analysis of the role and the place of the head in the control system; to requirements to which it has to answer; to character and content of its work; to indicators of an assessment of activity of the head.

During the research we estimated the group of indicators (by the technique of L. V. Balabanova) which answer with knowledge of the manager of technology of the personal work (knowledge of rules and receptions of the organization of personal work and ability to use them), namely: ability to organize a workplace; ability to use organizational and computer facilities; ability to work with information; ability to make documents; ability to speak by phone; ability to listen; ability to plan affairs; knowledge of methods of rationalization of a personal labor; ability to use an organizer; ability to change the sphere of classes; knowledge of technology of communications; ability to find and get a job; ability to delegate powers; ability to interact with the deputy; ability to adapt in collective.

As a result of data processing it is established that fully (100%) respondents use the following knowledge and abilities: to use organizational and computer facilities, to work with information, to make documents, to speak by phone, to plan affairs, to adapt in collective, to change the sphere of classes.



Pic. Flowchart of organizationally-pedagogical conditions of the effective activity of managers of the sports organizations

However it is revealed that 53% of respondents underestimate that help which the deputy can provide (a methodologist, an expert). His functions are quite often reduced to a document transfer and oral instructions. It can be explained, on the one hand, with the low level of business qualification of managers, on the other hand – mistrust to opportunities of the deputy (a methodologist, an expert) and therefore the insufficient requirement to results of his activity. It also demonstrates that these heads don't carry out the delegation of powers which leads to an overload and irrational use of time by managers. The delegation of powers to workers psychologically provides unity of trust and insistence – the basic principle which "works" for the organization of the "communicative space": trusting, the head gives to workers an opportunity as much as possible to make use of their experience, knowledge and abilities, performed by tasks, and demanding – he increases the responsibility of workers for their quality, volumes and terms. It is also established that 47% of respondents not fully use methods of rationalization of a personal labor. Therefore management personnel capacity decreases, and also outstanding in time documents collect.

Certainly, the organization of the rational administrative work depends on a state of health of the manager and his relation to a healthy lifestyle. The healthy lifestyle and efficiency of office activity of managers are closely connected among themselves. Managers with poor health, the debalanced nervous system often lose self-control in difficult situations, painfully react to criticism of the highest administration, generate nervousness and tension in the collectives, which are headed by them, aren't able to stand adequately for themselves and the subordinates. For this reason we offered to respondents to arrange and to specify extent of use of indicators which characterize their relation to a healthy lifestyle: physical activities; healthy nutrition; dream; breath; water procedures; training; fight against noise; fitness of the nervous system; ability to relax; work-rest schedule; refusal of addictions. It is established that treat group of the least significant and used indicators: physical activities; healthy nutrition; training. The degree of coherence of respondents makes W=0,71.

Strong physical and psychological health of the manager is office need for him and has to be constantly in the center of his attention for the preservation of high performance for many years. For this purpose it is necessary to conform to the rules of the scientific organization of the work of the manager, you pass the regular medical review, to go in for physical culture, to refuse addictions (smoking and alcohol), to know a technique of removal of fatigue during the working day and after it, to be able to increase the health for a short rest-hour. The manager has to follow the rules of rational connection of work and rest, the mode of healthy nutrition, has to be able to support actually vigorous mood and mood of the collective for avoidance of overfatigue, the increase of labor productivity, the preservation of resistant working capacity.

Conclusions

All problems which arise in the control system of any objects are resolved by people. The manager as the subject of management analyzes the situation, predicts strategy and will organize the operational management from its realization. Considering the integrated approach to the rationalization of the work, we have concentrated the attention only on some objects of the rationalization of the administrative activity.

Thus, it is necessary to carry to ways of the rationalization of work of managers of the sports organizations:

- the organization of work concerning the development of motivational mechanisms of activity in the sphere of physical culture and sport;

- the increase of economic appeal of work;

- the formation of ideology of a healthy lifestyle.

Prospects of the subsequent researches in this direction

The subsequent researches will consist in justification of components of functional approach to the rationalization of the administrative work in the sphere of physical culture and sport.

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Innovative methods of an assessment of physical condition of a person as a factor of ensuring the effective management of a moving object

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Purpose: *to establish the basic provisions of influence of a human factor on reliability of functioning of the system "the person – the object of management – the activity environment".*

Materials & Methods: *The general scientific methods of the analysis, analogy, deduction, comparison, statistical information processing. The methods of a statistical control of sample statistics on an alternative sign. The computer data processing with the use of Excel and Turbo Basic.*

Results: *the method of an individual control and an assessment of influence of a human factor on safety of functioning of the system "the person – the object of management – the environment" is developed.*

Conclusions: *The general provisions of the construction of the sign semantic spaces are established, which allow estimating the current functional state of a person–operator during his direct performance of the professional activity that provides control of its sufficient quality.*

Keywords: *Human factor, safety of movement, semantic spaces, norm of physical condition.*

Introduction

The international symposium on the applied questions of a human factor and ergonomics passed in June, 2015 in Las Vegas. The wide range of questions was considered, disclosing the importance of a role of a human factor in all types of professional activity, in which a person enters as an element of the system «the person– the object of management – the activity environment» in the program of a symposium [1]. A rapid development of a technique representing in this system the component «the object of management» allowed broadening the sphere of the carried-out professional activity significantly. It led to the fact that a person was the weakest link in the considered system «the person – the object of management – the activity environment». Inconsistency of functioning of its elements leads to different incidents which attract emergencies, and in some cases come to the end with accidents. The statistics of the happened accidents indicates that 87% from them occur because of a person [2].

The requirement of development of the system of continuous control of a condition of a person and an assessment of sufficiency of his functionality for a performance of the necessary professional activity, and also the creation of intellectual computer systems for a duplication of functional activity of a person in the conditions inaccessible for his stay acts as the uniting factor of all directions of the research of influence of a human factor.

The most convenient object of the research of this problem are technical sports, and in particular races on motorcycles with a sidecar in which all existing problems are combined, which are connected with optimization of work of the system «the person – the object of management – the activity environment» [3].

The purpose of the research

To establish the basic provisions of influence of a human factor on reliability of functioning of the system "the person – the object of management – the activity environment".

The task of the research

To establish the most general provisions which define the decrease in efficiency of the functional activity of a person. To define the physiological reasons of the decrease in efficiency of a person. To establish the general and special making reliability of a human factor depending on specifics of the professional activity and conditions of the environment in which it proceeds. To define the possible control methods and estimates of the current functional state, admissible for performance of a concrete level of complexity of professional activity. To establish borders of the allowed mistake measure depending on conditions of the carried-out professional activity.

Material & Methods

General scientific methods of the analysis, methods of analogy, deduction, comparison, static information processing. Methods of a static control of a sample statistics on an alternative sign. Computer data processing with the use of Excel and Turbo Basic.

Results and discussion

The efficiency of a performance of the system «the person – the object of management – the activity environment» depends on the coherence of interaction of its compound components providing the level of reliability of the exercised control.

The control of the happening changes in the environment and the corresponding external managing directors of actions of object of management acts as the operating factor in the coherence. This process demands manifestation of an adequate attention (observability) from the person-operator. The problem of finding of conditions of the controllability and observability connected with a possibility of definition of indicators of a state by results of measurement of physical variables in the system which is making the basic requirements in ensuring operability of the system, was put only in the second half of the last century, approximately in the century of emergence of the theory of regulation [4].

In turn, the concept of observability or attention which is carried out by a person-operator has a rather generalized character and demands definition of the structure of a condition of the attention which is providing observability and also the physiological mechanisms which are opening the reasons of its easing. The decrease in attention attracts the increase in an error of assessment of physical variables that leads to a violation of accuracy of the operated actions also, as a result, creates emergencies [5].

The general theory of dependence of size of the made mistakes and possible complexity of the organization of management was developed by V. N. Samsonkin [6; 8]. The main essence of this dependence is stated in proved to them direct and return theories about complexity of the structure of the functional organization of the system in tolerant spaces. The essence of their statement is reduced to the fact that «any functional system has a finite-dimensional complexity of the organization in a tolerant space «. Or «the complexity of the possible organization of the system is limited at the set tolerance of the forming space «. The converse consists that «the creation of the object or the process of the set complexity is possible at the certain tolerance which isn't surpassing some positive number». On the basis of these statements the consequence follows that «at aspiration of tolerance to zero the complexity of the system or the process can increase beyond all bounds and their stability to aspire to zero» [7].

A person, being in various conditions under which his professional activities are carried out, with the development of exhaustion reduces the observation (attention). Depending on conditions of the environment and preparedness to work, duration of performance of professional activity in these conditions is defined in it.

The experimental check of a period of operation depending on intensity of its course shows that this dependence is described exponential which reflects the development of an appropriate level of exhaustion. Thus, tolerance of an assessment of perception, which is flowing on a strict regularity, gives the instrument of control of the made mistake in an assessment of coordination of managing directors of actions with the required results. Therefore, the environment in which the management process takes place, defines requirements of what is necessary for interaction with it.

Having the communication of tolerance of interaction of elements of the system with the accuracy of implementation of the operating actions and regularity of change of tolerance in the course of performance of professional activity, it is possible to determine duration of safe implementation of management of the object with a rather high precision. At the same time the physiological reasons which cause exhaustion completely are defined by intensity of the carried-out activity.

Insufficiency of oxygen for ensuring processes of a metabolism (deterioration process); accumulation of products of an exchange (process of a contamination); exhaustion of an energy potential (process of exhaustion) relate to such reasons. Intensity of work defines individual share of the reasons of exhaustion. The special place in the structure of development of exhaustion causes the mode of monotonous work which proceeds against the changes of the internal environment which aren't overstepping the bounds of its deviation, which are capable to cause protective reactions for counteraction to exhaustion. In this case it is about the local center of braking which arose in the central nervous system. All four factors causing exhaustion always participate in its course, but their share importance in each case has various ratios depending on the character of the experienced strain [9].

The mechanism of the central braking develops as a result of local violation of regional blood circulation. The nature of such violation of the internal environment in direct control methods of its state isn't feasible. Only the existing control method of the development of the central braking is observed violation of accuracy of an assessment on indicators of force, time and spatial characteristics of the performed operations. The most effective method of fight against this kind of exhaustion is switching on other kind of activity as which active recreation acts [10].

In general it is necessary to exercise control of an admissible mistake on the end result of correctness of performance of the operated actions. A standard of comparison has to be for these actions. The previous experience of performance of a task and its step-by-step comparison with the current performance can act as such criterion. Or comparison from results of a double in a joint management with establishment of the allowed limit of discrepancy of the performed operations is.

The most perfect monitoring system behind the current functional state is its representation in special sign spaces. The essence of this advantage is that the high-quality division of structure of response of the operated actions into the stationary basic tension providing the level of necessary functional activity, and on its background of the pulsing adaptation behavior which is directed to the arising deviations in the environment of stay as reciprocal managing directors of the actions keeping an equilibrium condition of the system «the person – the object of management – the environment» is carried

out in the sign semantic spaces.

Such submission of the qualitative characteristic of work of any functional system is that the oscillatory process has a step of transition of accuracy of regulation from the previous state to the subsequent in the range of the shown functional activity from a minimum to a maximum and vice versa. The transition from one state to another is a pulse step (amendment amplitude). Therefore, there is the current value of maximum and minimum (max-min) that is characterized by a pulse difference or a step of the made amendment. In that case average value, rather control, a fluctuation of variation of activity occurs, will be defined as *(max – min)/2*. This size in the course of the exercised control can remain a constant or will change multidirectional both towards a maximum, and towards a minimum that is characterized as a pulsation of its trend.

The feature of representation of the structure of result of the characteristic of high-quality changes of functional activity consists in the determination of compliance to each level of functional activity or its intensity of step-by-step regulation of the made amendments to change of the current level of amendments. Such regulation of the functional activity can be observed concerning the level of its orientation, duration of manifestation of this intensity and prevalence of observed activity.

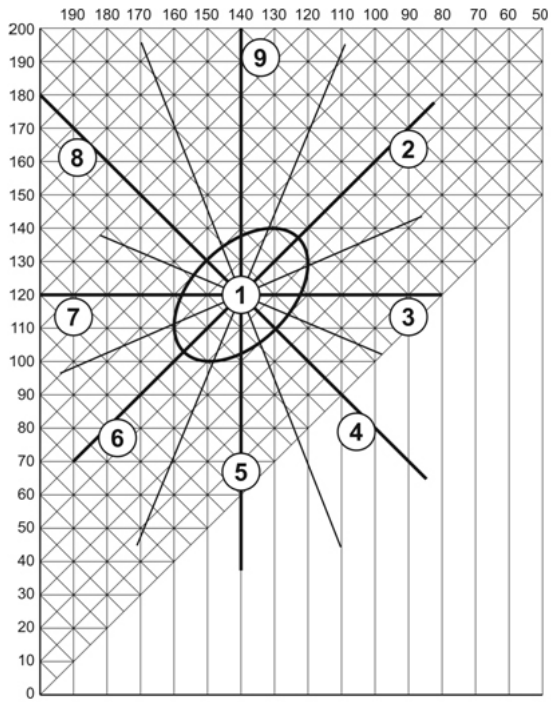
Each of the noted characteristics of the functional activity has the independent morphofunctional mechanism of manifestation which provides the relevant operational adaptive amendments to the relations with the environment of a stay.

The current value of the maximum and minimum size of the functional activity, their average value and step-by-step change of accuracy of regulation of a pulsation are connected by the simultaneous representation of the generalized point in uniform sign semantic space which allows to track regularity of behavior of a trend and pulsation of accuracy of the operated actions in the corresponding condition of intensity of the system.

As an example this regularity can be observed in the course of regulation of a local blood pressure. The objective registration of indicators of a local blood pressure allows establishing its maximum and minimum values. Pulse reaction or pulse pressure (P) is defined as a difference systolic (S) and diastolic (D) pressure. The average arterial pressure (AAP) is equal to a half of the sum of systolic and diastolic pressures *AAP=(S + D)/2*. This characteristic is the most stable and represents energy of the continuous movement of a controlled stream of blood (the existent process).

If to make a sign semantic space which can be presented as two combined coordinate systems in one of four characteristics of which changes of the top and lower borders of pulse fluctuation of rather some state (systolic and diastolic change of pressure) are reflected, and in another – the condition and size of pulse fluctuation, then the only point connecting them will describe a trend of a condition of system in the generalized zone of this space. The feature of creation of a semantic space consists that coordinate systems are turned by 45 degrees relatively each other (pic. 1, 2).

The presented sign semantic space is applicable for all cases of the description of processes when the adaptive step-by-



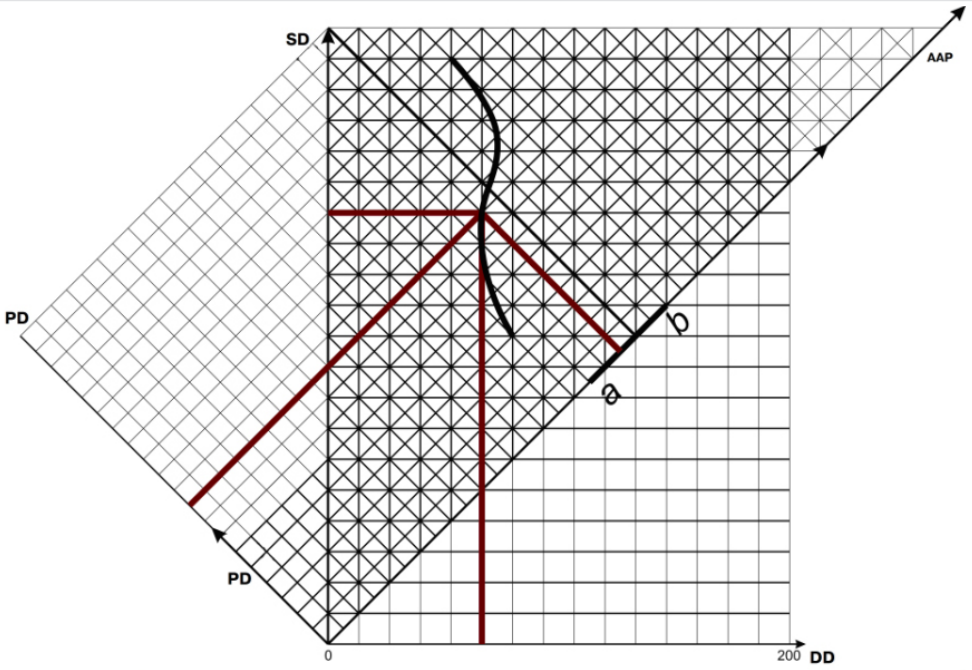
Pic. 1. The nomogram of dynamics of measurement of arterial pressure defining a characteristic orientation of change of arterial pressure:
1 – norm; 2 – the general hypertension; 3 – diastolic hypertension; 4 – pulse hypotonia; 5 – systolic hypotonia; 6 – general hypotonia; 7 – diastolic hypotonia; 8 – pulse hypertension; 9 – systolic hypertension.

step regulation of its equilibrium relations with the environment proceeds against any condition of the system. The constancy of their relation and the constancy of occurrence of these relations are established in spaces of this kind on the basis of absolute units of measure of controlled signs.

These compliances of the ordered representation of parameters allow establishing the analytical description of a trend of a condition of the system that gives the chance of forecasting of its behavior taking into account specific features of the considered interaction with the environment of a stay.

The most effective use in this regard is the control of a person-operator not on separate indicators of any functional system, and on their integrated indicator which is the equifinal result of the carried-out professional activity. Regardless of a type of the arising exhaustion, its final impact on the carrying-out professional activity is shown in the increase in an error of the introduced operating amendments [11]. It is led to increase in tolerance of space of the interacting components of the system «the person – the object of management – the environment» and to decrease in complexity of solvable problems of management of the object that follows from theoretical developments of V. N. Samsonkin [12].

The control of the accuracy of performance of operations of management of the object doesn't demand carrying out the test control of physiological processes and use of additional hardware providing which has probabilities of refusal and a random error of an assessment of the current state of an operator.



Pic. 2. The combined nomogram of dynamics of measurement of arterial pressure reflecting interdependent behavior of all characteristics AP:
SP – systolic pressure; DP – diastolic pressure; PP – pulse pressure (SP – DP); AAP – average arterial pressure (SP + DP)/2.

The current physical state will act as the forming condition in which it is carried out at control of direct result of the performed operated operations. The level of the current weariness will be the defining factor in an assessment of a physical state. As a certain accuracy of performance of the operated actions (their pulsation) corresponds to any state and borders of this pulsation are known, on the course of performance of operational professional activity in the system of the sign semantic space which was described above, the trajectory of movement of a trend of a working condition will be formed. The established limits of admissibility of an error of management in real time define a possibility of continuation of the performed work. We will exercise such control both at an assessment of prestarting preparedness, and in the course of direct activity [13].

The implementation of such control allows: to establish the most difficult conditions of interaction with the environment of elements of the system «the person – the object of management – the environment» which influence a working condition of the operator; to establish the level of proficiency and learning ability of a person-operator and duration of preservation of his working capacity; ensuring timely inclusion in work of the double or automatic control system. The accumulation of results of such information will promote the improvement of the automated management process and the creation of self-training system of the automated management of the object. The solution of the last point will allow excluding participation of a person in the management of object in the conditions which are inaccessible for his stay that increases safety of management of the system «the person – the object of management – the environment» in especially dangerous conditions of finding of the system «the person – the object of management – the environment».

Conclusions

1. The decrease in efficiency of the professional activity is connected with the increase in inaccuracy of an assessment of the made amendments to the operated actions that is defined by the blown process of exhaustion. The development of exhaustion increases tolerance of the corrected actions and reduces complexity of the solvable tasks. The analytical dependence connecting these factors allows to predict the approach of maximum permissible inaccuracy in the carried-out operated actions and to carry out the necessary amendments anticipating them.

2. The specifics of the professional activity define the development of the process of exhaustion of those functional systems which experience the highest strain. The transferable intensity of this loading causes the corresponding form of manifestation of exhaustion that causes the decrease in the general physical state and decrease in availability of performance of a certain complexity of the professional activity. The corresponding accuracy of an assessment of change of the environment is inherent to the level of a physical state and pulsation of a step of the made amendments to management of the object for each level.

3. The communication of the current state, the borders of a pulsation made at it amendments and the tendency of a trend of a state which are obligatory components of any functional system has the close analytical inter-conditionality which is revealed in the special sign semantic space reflecting constancy of the relations. The existing analytical communication of interdependent behavior of the considered signs allows exercising individual control of availability of performance of the professional activity.

4. The most effective method of safety of management of the object is not control of certain functional systems, but control of their integrated indicator which is reflected in the accuracy of performance of the professional activity and submits to the determined consistent patterns of behavior of a trend of a state and the related accuracy of the performed work.

5. The existence of the regularities reflecting inter-conditionality of the growth of inaccuracy in the operated actions; the exhaustion and the general physical state which are inherent in any functional system allow to carry out a model creation of these processes and to expand borders of opportunities of the automated control systems for the object, excepting participation of a person in the conditions which are inaccessible for his professional activity.

Further researches

In this direction will be connected with the development of intellectual automated control systems for the object with participation of the person who is out of the object.

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The management in the sphere of physical culture and sport at the level of administrative and territorial units: traditions and innovations

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Purpose: *to analyze the activity of subjects of management in the sphere of physical culture and sport at the level of territorial administrative units.*

Material & Methods: *the legal analysis of a feature of management in the sphere of physical culture and sport of administrative and territorial units of the various levels.*

Results: *the main activities of administrative structures of the governmental authorities and the local governments are allocated.*

Conclusions: *it is revealed that the sphere of physical culture and sport needs the improvement in the conditions of decentralization; offers on its reforming are considered.*

Keywords: *state run public authorities, local government authorities, sphere of physical culture and sport, administrative and territorial unit.*

Introduction

The administrative-territorial and functional reforms in Ukraine, the European vector of the development of the country cause organizational changes which happen in all spheres of the Ukrainian society including the sphere of physical culture and sport.

The traditional analysis of literature, standardly-legal sources [1; 4; 5; 7; 8] gave an opportunity to find some features of management in the sphere of physical culture and sport of administrative and territorial units of different level. The systematization of the saved-up experience of management in different segments of administrative and territorial units including in the sphere of physical culture and sport is actual in the conditions of carrying out the decentralization in Ukraine.

The article is based on practices of such scientists as A. V. Pochinkin [3], I. I. Prikhodko, V. I. Mudrik [6] who investigated the organization of the public administration in the sphere of physical culture and sport.

Communication of the research with scientific programs, plans, subjects

The research is executed according to the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 of the Ministry of Ukraine of family, youth and sport, by a subject 2.6 “Theoretico-methodical bases of the improvement of the training process and competitive activity in the structure of long-term training of sportsmen” (No. of the state registration is 0111U001168).

The purpose of the research

To carry out the analysis of activity of subjects of management in the sphere of physical culture and sport at the level of territorially-administrative units.

Research task:

1. To investigate the traditional ways of interaction of public authorities and local governments as subjects of management in the sphere of physical culture and sport in Ukraine.

2. To define the contradiction in the modern control system in the sphere of physical culture and sport at the level of territorially-administrative units.

3. To define the directions of improvement of the system of the state regulation of the development of the sphere of sports activity.

Material & Methods

We used the following methods of the research to achieve the aim: traditional analysis of literature, legal analysis.

Laws of Ukraine “About physical culture and sport”, “About merging of societies”, statements, reports, provision on structural divisions of public authorities and local government are analyzed during the research. Features of activity of bodies and organizations on providing sports-improving and sports services to the population were found in different spheres.

Results and discussion

The sphere of physical culture and sport in Ukraine is a generally-national phenomenon which reflects an achievement and problems of all country in many respects. At the same time its social mission is a satisfaction of needs of specific individuals – consumers of sports services which are united by a resi-

dence within a separate administrative and territorial unit.

For today administrative and territorial units in Ukraine differ by three bases:

1) they are divided into regions (ARC, areas, regions, cities-regions, Kiev and Sevastopol) and settlements (cities, settlements, villages) by geographical signs;

2) according to the status – on: administrative and territorial units (areas, regions), self-coping territorial units (cities, settlements, villages). Besides, ARC has the special status of the territorial autonomy, and areas in the cities are characterized by signs both administrative-territorial, and self-coping units);

3) by a place in the system of the administrative-territorial device of Ukraine – on territorial units of the primary level (cities without a regional division, areas in cities, settlements, villages), the average level (areas, cities with a regional division) and the highest level (The Autonomous Republic of Crimea, areas, Kiev and Sevastopol) [2].

The control system is inherent to the sphere of physical culture and sport of each of administrative and territorial units which structure depends on the noted level – the primary, the average or the highest, and elements are bodies that answer them which exercise control at these levels. It is defined in the article 5 of the Law of Ukraine "About physical culture and sport" "The public administration in the sphere of physical culture and sport" that the public administration of physical culture and sport is exercised of the central executive authority in the sphere of physical culture and sport with an assistance of respectively other public authorities and local governments [5]. At the same time the central executive authority in the sphere of physical culture and sport interacts with the central executive authorities, other public authorities and local governments in the sphere of physical culture and sport.

The Ministry of youth and sport of Ukraine is the principal organ in the system of the central executive authorities which provides a formation and realizes a state policy in the youth sphere, the sphere of physical culture and sport according to the Provision on the Ministry of youth and sport of Ukraine which is approved by the resolution of the Cabinet of Ukraine of July 2 in 2014 No. 220.

It is specified in the Constitution that the executive power in areas and regions is put on local authorities – regional and district public administrations which are a part of the system of executive authorities of Ukraine [2].

At the same time the control of local affairs is exercised by local governments: councils and their executive bodies – executive committees of village, settlement and city councils what they form independently. The called bodies aren't state, however the local governments can be allocated with separate powers of executive authorities according to the article 143 of the Constitution of Ukraine [2].

The control of the sphere of physical culture and sport is exercised:

– at the regional level – governing bodies of physical culture and sport (Departments and committees on affairs of physical culture and sport of regional, regional public administrations);
– at the local level – local governing bodies (Committees on physical culture and sport of regional administrations and city councils);
– at the level of settlement creations – public commissions or departments of physical culture and sport.

The exhaustive list of functions and powers of local governing body of the sphere of physical culture and sport isn't defined by the law of Ukraine "About physical culture and sport". But, some of them contain in the section II of the Law "Subjects of the sphere of physical culture and sport". In particular, it, as the local public administration, is granted the right to act as founders of certain subjects of the sphere of physical culture and sport and to give them support (financial, personnel, information).

So, for example, the main tasks at the regional level of the Department of physical culture and sport, family and youth of the regional public administration are:

1) providing with:

- realization of a state policy concerning physical culture and sport, family and youth;

- social and legal protection of families and youth, equal rights and opportunities for participation of women and men in political, economic and cultural life, assistance to social formation and development of youth, prevention of violence, in a family, counteraction to human trafficking;

- physical education and sports-improving activity in teaching and educational, production and social spheres on the principles of a priority of an improving orientation, use of modern means and forms of development of physical culture of the population;

- participation of national teams of area in the state competitions, assistance in preparation and effective use of shots concerning physical culture and sport;

- promotion of a healthy lifestyle, assistance of development of the Olympic and Paralympic Movement, organization of improvement of the population;

2) participation in formation and ensuring realization of a state policy at the regional level concerning physical culture and sport, improvement of the situation of families, rest and leisure of youth;

3) preparation of analytical, information and statistical materials, organization of carrying out researches of a condition of development of physical culture and sport, family and youth;

4) development and realization together with other local executive authorities, citizens and associations of citizens of the actions which are aimed at the subsequent development of physical culture and sport, improvement of the situation of a family, rest and leisure of youth;

5) organization and carrying out sports competitions, educational and training meetings, sports-dramatizing holidays, competitions and other actions among the general population;

6) assistance for:

- youth and other public organizations in carrying out by them work on questions of physical culture and sport, family and youth;

- international cooperation on physical culture and sport, family and youth [4].

The detailed list of tasks, powers and rights of the Department of physical culture and sport, family and youth of the regional public administration is provided, demonstrates that this state body of the sphere of physical culture and sport has potential bases to act as the leading subject of public administration at the regional level.

It becomes especially obvious if to compare the officially defined administrative functions of the state body with the similar list of the relevant structural division of local government.

So, the Constant commission of the Dnipropetrovsk regional council concerning culture, spirituality and sport, is formed and works according to the solution of a regional council of October 27, 2006 No. 24-4/V and in the course of activity cooperates with departments and managements of the executive office, the constant commissions of the regional council, managements, departments, other structural divisions of the Dnipropetrovsk regional state administration, deputies of local councils, local councils of area of all levels, the regional municipal enterprises, institutions, establishments, public associations, and so forth.

The Dnipropetrovsk regional council has approved such **main activities** of the Youth welfare department and sport:

1. Ensuring free development of sports processes, access for citizens to all sports institutions, all types of service in the sphere of physical culture and sport.

2. Definition and ensuring of the realization of the prime and perspective measures which are directed to formation in the city of model of development of the sphere of physical culture and sport on the democratic and humanitarian principles.

3. Providing guarantees of the realization of youth, family policy and policy in the sphere of physical culture and sport in Dnipropetrovsk concerning creating favorable conditions for vital self-determination and self-realization of young citizens, their vocational guidance.

4. Organization of youth leisure, development of sports, children's, youth and women's public organizations.

5. Assistance of activity of bodies of student's self-government.

6. Implementation of actions for promoting of a healthy lifestyle, physical culture and sport.

7. Social support of youth and family.

8. Ensuring realization of policy in the sphere of improvement and rest of children.

9. Realization of youth policy in the part of the solution of housing problem by creating favorable conditions for the development of preferential crediting for construction (reconstruction) and acquisition of housing for youth [7].

The subject of management in the sphere of physical culture and sport is the local government in which, as a rule, the constant commission of council functions in territorial units of the primary level (cities without a regional division, areas in cities, settlements, and villages). So, the commission on questions of education, health care, and legality of social and legal protection, physical culture and sport is created in the Anniversary settlement council of the Dnipropetrovsk district of the Dnipropetrovsk region.

Changes in the Constitution which were decided by the Supreme Council at the end of August in the 1st reading, cardinally change the system of local government in the country. But the process already started even to the final adoption of these changes – from change of the structure of the income of local budgets and creation the joined territorial societies.

Not everything in the reform of the administrative-territorial device needs fixing in the Constitution – financial changes were put last year in the Budgetary and Tax codes because of what more taxes were reoriented on places, now the unity lasts territorial societies which are already formed over 180 [8]. In these conditions it is necessary to recognize the contradictions whicy are inherent in the modern control system of the sphere of physical culture and sport:

- between the settled practice of management of physical culture and sport and requirements of time when there is an urgent need of close interaction of all structures of management at the different levels which are on different, often polar, administrative positions;

- between the need of the closest interaction of public authorities and local government in the conditions of new legal relations both actual limitation and unpreparedness to it regional administrative system in the sphere of physical culture and sport;

- between the need of complex interaction of representatives of the government and local government, business, institutes of the civil society and active attraction to processes of management of physical culture and sport of a general population and absence at them of knowledge, skills which allow to carry out such actions.

The solution of these contradictions needs such approaches to reforming of the control system in the sphere of physical culture and sport at the level of administrative and territorial units which would provide an active participation of subjects of the sphere of physical culture and sport of the administrative and territorial unit at all of them. According to the current legislation of Ukraine belong to them: sports clubs; children's and youth sports schools; specialized educational institutions of a sports profile; schools of the highest sports skill; centers of the Olympic preparation; sports and improving institutions; centers physical health of population; centers of physical culture and sport of disabled people; collectives of physical culture; local cells of sports societies and sports federations; public organizations of a sports orientation of pupils and students; the department of National Olympic Committee of Ukraine [5].

The position of Igor Zhdanov, a head of this executive authority, was published on February 19 in 2015 on the website of the Ministry of youth and sport of Ukraine. In his opinion, the European model of relationship of the state and sport is the most acceptable for Ukraine [1].

The Ministry of youth and sport or the appropriate government body, which forms and realizes the state policy in the branch, is practically in each country of the European Union. At the same time there are sports federations which have large autonomous powers.

The refusal of "manual" distribution of the budget between sports and ensuring transition to the automatic system, which will exclude a human factor, is one of the directions of the presented reform. For this purpose there was an advanced formula by which ratings of federations are defined and there is a distribution of public funds among the Olympic and Non-Olympic sports. The distribution of means will be based on transparent and clear rating for everybody which will stimulate sports and sportsmen to a competition and achievement of the best sports results. Also the interaction and the help of national federations to Armed Forces of Ukraine, National guard, SSU and so forth will be considered [1].

One more direction of reforms – is the increase of autonomy of national sports federations.

Around the world elite sport is based on the international federations on sports and on activity of national federations which are members of the world associations.

National federations still are rather dependent on the Ministry in Ukraine. Therefore the following direction of reform – the essential increase of autonomy of national sports federations. In particular, the corresponding pilot project began in the second quarter in 2015 [1].

Since 2015 financings of children's and youth sports schools are carried out from local budgets. At the same time CYSS need reforming: it is necessary to expand their powers, to define an order of providing paid services by them, to join their activity with national sports federations.

According to I. Zhdanov, a full public discussion of the offered changes, the maximum openness and the accounting of all constructive proposals, is one of the main keys to success of carrying out reforms in the sports branch [1].

Conclusions

The development of a social and economic situation in Ukraine, the leading role of physical culture and sport in national economy and safety of the state predetermines the transition from the centralized model of management of physical culture and sport to new, decentralizing and democratic mechanisms of interaction with the state, public and commercial organizations. It needs the improvement of the state regulation of the development of sports movement at the regional level, strengthening of coordination of work of the sports organizations of a different profile and different forms of ownership, formations of regional programs of development of physical culture and sport, the increase of efficiency of business activity, sports-improving organizations at the level of administrative and territorial units.

The creation of conditions for the development of physical culture and sport within the corresponding administrative and territorial unit is one of the important components of activity of the local management. At the same time it is important that the corresponding actions of subjects of the local management had not spontaneous, casual character, and occurred in the form of well reasonable sports policy, the effective mechanism of realization of which target programs act.

Such conditions are the most important and the most determinant from the positions of application of the programmatically-aimed approach in management of the sphere of physical culture and sport of the administrative and territorial unit: the existence of the government body of management of the sphere of physical culture and sport; the existence of the aimed program of the development of physical culture and sport; the interaction of public authorities and local government in the sphere of physical culture and sport with public organizations.

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Sport's selection of volley-ball players: morphological and pedagogical criteria of definition of movement endowments: (information 1)

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Purpose: *to define methodology of initial sports selection of young volley-ball players.*

Material & Methods: *methods of theoretical analysis and generalization, bibliographic method of search and study of scientific information, a systematic analysis are turned to account in this work.*

Results*: the article deals with the theoretical model of the mast important factors, which define sports endowments of volley-ball players. It is shown the point estimation of body structure and composition, motor and psychomotor abilities, dynamic possibilities, psychophisiological indices in the prognosis of volley-ball players gifted for high sports results.*

Conclusions: *criteria of high movement endowments of volley-ball players are defined; norms of estimation of motor abilities of valley-ball players on the initial steps of sports selection are given.*

Keywords: *sports selection, model characteristics, motor (movement) endowments, morphological signs, movement abilities.*

Introduction

Achievements of high sports results in world sport, including high achievements on the Olympic Games, are available to almost high-gifted sportsmen. The system of sports selection represents possibilities of the search of sports talented children and the prognostication of their potential abilities.

It is possible to note in modern conditions of development of sports science in general that the system of sports selection was created in many countries of the world: Ukraine [2; 13; 17; 18], Russia [6; 8; 16], USA [19; 21], Poland [15] and other countries. The training course for students of specialty physical education and sport of higher educational institutions of the level III-IV of accreditation is prepared in Ukraine. However many sports didn't receive due attention concerning scientifically caused concept of selection at its various stages yet. It is necessary to call the Olympic type among such sports – volleyball.

The characteristics which are defining success in this sports game are the following. Sportsmen-volleyball players (both men and women) must have the considerable total morphological sizes of a body, special proportions of segments of a body. Only sportsmen with high development specific to this game by the development of motive abilities can achieve good results: high-speed and power abilities, certain types of coordination abilities, anaerobic endurance. Psychomotor and mental features of the personality are important for volleyball players. High development of functional systems of an organism defines sports result: sensory, cardiovascular, etc. [7; 14].

However we will note that the consideration of methodology of sports selection of volleyball players, the definition of the most significant criteria for evaluation of motive endowments from positions of the development of modern sports science demand the further scientific development.

Communication of the research with scientific programs, plans, subjects

The work is performed according to the Consolidating plan of the research works in the sphere of physical culture and sport for 2011-2015 of the Ministry of Ukraine of family, youth and sport, the subject «Theoretic-methodical bases of individualization of the educational-training process in game sports» (No. of the state registration is 0112U002001).

The purpose of researches

To define methodology of the initial sports selection of young volleyball players on the basis of morphological and pedagogical criteria of sports endowments.

Material & Methods

Methods of the theoretical analysis and generalization, the bibliographic method of search and studying of scientific information, the system analysis were used in the work. As experts note, articles with the methodological orientation of consideration of any problem form a complete idea of a certain scientific direction and are strong incentive of future researches.

Results and discussion

Criteria which determine prospects of young sportsmen to classes by volleyball are the age, morphological features of a structure of a body, the development of certain motive abilities.

The age of volleyball players at various stages of long-term preparation. As believes T. O. Bompa [20], the basic selection of volleyball players has to be at the age of 10–12 years old. The age of special preparation (selection of capable and talented sportsmen) at volleyball players is – 15–16 years old. The age of achievement of good results – 22–26 years old.

However the age terms of the beginning of classes are accepted by volleyball in various countries. So, the age of basic selection of volleyball players is 6–7 years old in China and the USA, and in Russia – 9 years old [10].

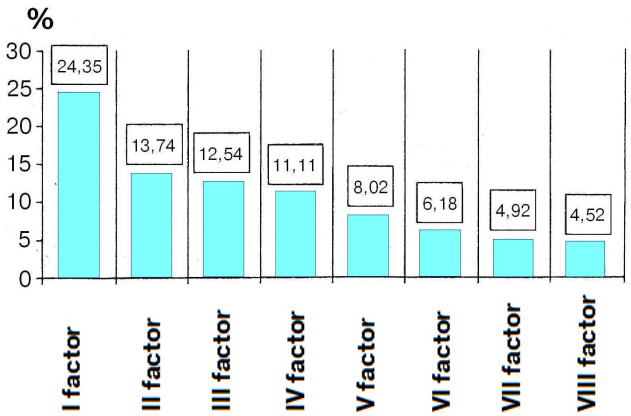
The age of volleyball players – participants of the Olympic Games – is given in tab. 1. We will note that woman reached high qualification in volleyball at younger age, than men. Winners of the Olympic Games have more considerably age in comparison with medalists and finalists of competitions at men. Such differences aren't observed at women.

Informational content of signs and abilities which are defined high sporting achievements of volleyball players. M. S. Bryl, S. Novarro [1] estimated informational content of morphological features, motive abilities and psychological characteristics in the system of sports selection in researches of young volleyball players at the age of 13–16 years old (tab. 2). A degree of informational content was determined by correlation coefficients between phenotypical manifestation of a sign and indicators of efficiency of the competitive activity. It is revealed that jump up from the place, difficult reaction, operational thinking, distribution of attention, level of claim, have a high informational content. A little smaller a degree of informational content is characteristic of indicators of length of a body, run on 5 m, kinesthetic sensitivity. And such morphological indicators have a moderate degree of informational content: body length with the raised hand, scope of hands, length of the top extremities; motive abilities: the explosive muscular force estimated by indicators of a long jump from the place and a throwing of a ball, high-speed abilities which are estimated by run on 20 m; psychological signs: simple motive reaction and functional activity of the visual analyzer (visual depth). Some of morphological indicators (body weight, length and width of a hand, active fatty body weight) aren't informative in the system of sports selection of volleyball players.

The importance of indicators in the system of special preparedness of highly skilled volleyball players can be estimated by results of the factorial analysis. S. V. Harkusha [5] having analyzed factorial structure of special preparedness of volleyball players of high qualification, have found the importance of the following factors (pic. 1):

- the leading factor (makes 24,35% of the general dispersion) are morphological indicators (lengths of a body and prolixity indicators of segments of a body);

- the factor which the author called «high-speed and power» (indicators of test tasks run by «fir-tree», run on 60 m, bending extension of hands in an emphasis lying belong) makes



Pic. 1. Factorial structure of special preparedness of volleyball players

13,74%;

- such indicators as body weight, thorax volume on a breath and an exhalation, the vital capacity of lungs belong to the third factor which makes 12,54% of the general dispersion of selection;

- the author characterizes the fourth factor as «the explosive force»: jump up from the place, long jump from the place and other kinds of jumps is characterized by tests. The contribution of this factor to the general dispersion of the selected data makes 11,11%;

- the indicators of heart rate belong to the fifth factor which the author called «a functional condition of cardiovascular system» (the factor makes 8,0% of the general dispersion of selection);

- the sixth factor called «the general force» (6,2%) – is defined by indicators of force of muscles of the right and left hands, pulling up on a crossbeam;

- the seventh factor characterizes a functional condition of respiratory system which makes 4,9% of the general dispersion of selection;

- the eighth factor characterizes ability to carry out the shock movements by hands (makes 4,5% of the general dispersion). It is estimated by the results of tests of a throw of a ball by two hands from behind a head, standing, sitting also in a jump.

The given abilities and indicators, in our opinion, are also informative in the system of sports selection of volleyball players.

Results of the above-stated researches allow us to build theoretically hierarchical model of informational content of certain signs and abilities (measurements and tests) which define sports endowments of volleyball players (tab. 3). the whole model makes 100 points on the analog with the American system [19].

Morphological indicators (organization of a body and structure of a body) – 35 points have the greatest mark assessment, then motive abilities – 31 points, further functional indi-

Table 1

The age of volleyball players (men and women) – participants of the Olympic Games of 1988 and 1996 [23]

The Olympic Games	Winners and participants	Number of the investigated	Age, years
	Men		
1988, Seoul	The USA	12	26,3
	Medalists	36	26,2
	Finalists, 1–8	96	25,8
	Places 9–12	48	25,1
	Total 1–12	144	25,5
1996, Atlanta	Нидерланды	12	27,8
	Medalists	36	25,9
	Finalists, 1–8	96	25,7
	Places 9–12	48	24,4
	Total 1–12	144	25,3
	Women		
1988, Seoul	USSA	12	23,7
	Medalists	36	23,8
	Finalists, 1–8	96	23,4
1996, Atlanta	Cuba	12	25,1
	Medalists	36	24,5
	Finalists, 1–8	96	25,3
	Places 9–12	48	24,7
	Total 1–12	144	25,1

Table 2

Informational content of morphological features, motive abilities and psychological characteristics in the system of sports selection of volleyball players

Indicators	Volleyball players of 13–14 years old (n=45)	Volleyball players of 15–16 years old	Degree of informativeness
	Morphological features		
Body length	0,649	0,562	xx
Body weight	0,016	0,102	
Body length with the raised hand	0,257	0,467	x
Scope of hands	0,224	0,304	x
Length of the top extremities	0,349	0,271	x
Length of a hand	0,017	0,072	
Width of a hand	0,032	0,015	
Active fatty body weight	0,241	0,124	
Fatty body weight	0,024	0,070	
	Motive abilities		
Long jump from the place	0,478	0,472	x
Jump up from the place	0,872	0,847	xxx
Throwing of a ball	0,485	0,603	x
Run on 5 m	0,732	0,776	xx
Run on 20 m	0,416	0,301	x
	Psychological characteristics		
Simple reaction	0,327	0,386	x
Difficult reaction	0,686	0,705	xxx
Operational thinking	0,706	0,739	xxx
Visual depth	0,411	0,441	x
Kinaesthetic sensitivity	0,347	0,590	xx
Distribution of attention	0,702	0,624	xxx
Level of claim	0,684	0,709	xxx

Note. *Reliable coefficients of correlation are emphasized. xxx – a high degree of informational content; xx – an average degree of informational content; x – a moderate degree of informational content.*

Table 3

Factors (indicators and abilities) which are defining endowments of volleyball players

The controlled system	Indicators	Tests	Assessment of a test, points
Organization of a body and structure of a body	Body length	Anthropometry	23
	Scope of hands		7
	Active body weight and constitution		5
Motive abilities	High-speed force:		
	feet	Jumps up and in length from the place	9
	hands	Ball throwing	5
	Maximum force	Hand dynamometry	3
	Power endurance	Pulling up on a crossbeam	3
	Coordination abilities	Shuttle run	5
	High-speed abilities	Run from 5 till 20 m	6
Functional abilities	Cardiovascular system	HR, AP and etc. Functional tests	10
	Respiratory system		8
Psychomotor abilities	Difficult motive reaction	Techniques of E. P. Ilyin	5
	Simple motive reaction		3
Psychophysiological indicators	Operational thinking	Psychophysiological techniques	3
	Kinestetic sensitivity		2
	Distribution of attention		3

Note. *Point total: 100 – owners of the gold Olympic medal; 90 – the Olympic team; 80 – the national team; 70 – the regional champion; 60 – the winner of local competitions; 10 – the viewer at competitions.*

Table 4

Total anthropometrical indicators of men's teams – participants of the 14th World Championship in volleyball [4], $\bar{X}\pm S$

Country	Anthropometrical indicators	
	Body length, sm	Body weight, kg
Algeria	191,6±3,18	83,2±5,62
Argentina	193,7±6,75	89,8±6,72
Australia	197,8±5,99	91,7±7,26
Brazil	196,7±6,51	87,4±7,67
Bulgaria	198,6±7,16	86,1±6,08
Canada	195,4±5,62	92,8±6,26
China	195,8±4,51	84,2±4,86
Cuba	197,3±4,62	87,7±6,51
Czech Republic	197,8±5,10	91,8±6,90
Egypt	193,5±7,55	89,7±8,29
Spain	195,9±4,78	88,8±6,53
Greece	197,8±3,90	87,6±4,68
Iran	191,4±6,44	84,3±6,93
Italy	195,9±6,19	87,3±5,30
Japan	191,3±9,01	81,7±7,43
Korea	193,2±7,23	81,9±6,03
Holland	198,7±5,85	90,4±5,73
Poland	200,0±7,09	89,9±6,65
Russia	201,2±6,97	91,7±6,96
Thailand	186,7±3,87	77,3±3,72
Turkey	197,0±4,31	84,9±5,90
Ukraine	199,7±5,11	93,8±7,88
USA	198,9±5,33	93,2±5,73
Yugoslavia	197,4±4,77	89,3±5,84
Average indicators of participants (n=429)	196,0±6,60	87,7±7,41

Table 5

Total anthropometrical indicators of men's teams – participants of the Olympic Games of 1988-1996 [23]

The Olympic Games	Winners, participants	Anthropometrical indicators of construction		
		Body length, sm	Body weight, kg	Ponderalis index, con. un.
1988, Seoul	The USA	193,9	88,3	43,56
	Medalists	194,8	89,6	43,57
	Finalists, 1–8	195,4	88,9	43,80
	Places 9–12	190,7	83,0	43,74
	Total 1–12	193,8	86,9	43,79
1992, Barcelona	Brazil	195,6		
	Medalists	197,0		
	Finalists, 1–8	195,6		
	Places 9–11	192,2		
	Total 1–11	194,6		
1996, Atlanta	Netherlands	201,6	93,0	44,50
	Medalists	198,7	90,8	44,20
	Finalists, 1–8	197,5	80,4	44,16
	Places 9–12	190,4	88,2	44,13
	Total 1–12	197,1	89,0	44,15

Note. *The ponderalis index pays off on a formula* $L = \frac{P, kg}{L, sm}$ *, where P – body weight, L – body length.*

Table 6

Total anthropometrical indicators of women's teams – participants of the 13th World Championship in volleyball [4], X±S

Country	Anthropometrical indicators	
	Body length, sm	Body weight, kg
Brazil	183,1±4,99	70,0±5,55
Bulgaria	184,4±4,64	68,6±6,97
China	182,3±3,76	72,2±3,99
Croatia	184,4±4,90	72,6±5,74
Cuba	180,6±4,95	71,3±5,01
Dominican Republic	186,2±5,55	69,5±2,83
Germany	185,4±4,91	72,7±8,50
Italy	182,6±5,45	71,6±6,41
Japan	178,8±6,06	67,7±5,60
Kenya	173,4±8,27	70,7±7,54
Korea	177,3±4,80	67,8±3,81
Holland	183,1±7,23	71,2±5,83
Peru	177,1±6,08	68,9±5,97
Russia	187,4±5,86	73,1±2,83
Thailand	174,1±5,06	63,2±4,88
USA	183,3±5,06	71,7±3,73
Average indicators of participants (n=285)	181,5±6,76	70,2±5,93

Table 7

Total anthropometrical indicators of women's teams – participants of the Olympic Games of 1988–1996 [23]

The Olympic Games	Winners, participants	Anthropometrical indicators		
		Body length, sm	Body weight, kg	Ponderalis index, c. u.
1988, Seoul	USSA	183,5	74,	46,69
	Medalists	180,3	70,9	43,62
	Finalists, 1–8	178,7	68,4	43,82
1992, Barcelona	Cuba	179,8		
	Medalists	181,1		
	Finalists, 1–8	180,1		
1996, Atlanta	Cuba	181,7	72,1	43,65
	Medalists	181,7	71,4	43,80
	Finalists, 1–8	182,4	72,1	43,82
	Places 9–12	178,3	68,7	43,58
	Total 1–12	181,0	71,0	43,74

Table 8

Length anthropometrical indicators of volleyball players of various game role (n=60), $\bar{X}\pm S$

Anthropometrical indicators	Players of the I temp	Players of the II temp	Libero	Binding players
Body length, sm	198,3±6,0	196,2±4,4	189,9±2,7	188,4±4,4
Length of a head, sm	29,4±1,2	29,2±1,5	29,9±2,1	28,9±1,0
Length of arms, sm	88,0±3,7	86,9±4,0	82,0±1,4	82,9±4,3
Length of legs, sm	104,3±5,1	101,4±3,6	97,1±3,2	97,4±3,9
Length of a trunk, sm	62,8±3,4	63,5±3,4	61,5±2,3	59,0±1,9
Length of a trunk, sm	36,5±2,2	35,6±1,7	34,3±1,9	34,4±2,1
Length of a forearm, sm	30,0±1,7	29,8±1,8	27,9±1,4	28,2±1,6
Length of a hand, sm	23,5±1,0	23,4±1,4	22,0±0,7	22,0±1,1
Length of a hip, sm	47,1±2,9	44,9±1,6	45,0±1,6	42,6±3,0
Length of a shin, sm	50,9±3,1	50,3±3,2	47,9±2,6	48,5±2,4
Length of a foot, sm	30,3±1,1	29,7±1,2	28,3±0,9	28,4±0,9

Table 9

Girth anthropometrical indicators of volleyball players

Anthropometrical indicators	Players of the I temp	Players of the II temp	Libero	Setters
Thorax circle (on an inhalation), sm	99,8±3,5	97,5±3,2	99,0±3,0	98,0±2,8
Thorax circle (on an exhalation), sm	97,5±3,3	91,0±3,5	94,5±2,9	89,0±3,0
Thorax shoulder, sm	28,8±1,7	28,5±1,5	30,5±1,1	28,5±1,2
Thorax forearm, sm	26,8±1,0	27,1±1,7	28,3±1,2	27,0±1,1
Thorax hip, sm	56,2±1,7	56,7±3,5	57,5±2,2	52,5±2,5
Thorax shin, sm	38,8±1,2	37,8±1,5	39,5±1,1	36,5±1,4

Table 10

Anthropometrical indicators of volleyball players of various age groups [12], $\bar{X}\pm S$

Anthropometrical indicators	Age group, years				
	13–14 (n=116)	15–16 (n=64)	17–18 (n=51)	19–20 (n=26)	21 … (n=32)
Length of a body, sm	172,98±7,85	182,07±7,03	186,84±7,00	194,44±5,94	192,28±5,60
Body weight, kg	58,41±9,85	69,16±10,78	74,74±9,41	81,64±6,76	84,72±8,18
Thorax circle (on a inhalation), sm	87,01±6,44	94,01±6,33	97,34±6,27	100,92±3,39	102,33±4,01
Thorax circle (on an exhalation), sm	79,20±6,12	85,66±6,00	89,07±6,26	92,26±3,56	94,41±4,42
Girth of a shoulder, sm	26,00±2,49	27,88±2,13	28,35±1,43	31,30±2,11	30,31±2,40
Grasp of a forearm, sm	23,92±1,89	25,69±1,52	26,33±1,03	28,20±1,25	28,19±0,75
Grasp of a hip, sm	48,07±3,69	50,70±3,79	51,88±3,11	55,20±4,97	55,50±3,15
Grasp of a shin, sm	35,01±2,03	36,44±2,15	36,70±1,76	39,10±1,24	38,56±0,68
Length of a head, sm	24,93±1,84	25,94±1,62	26,41±1,62	27,27±1,71	26,79±1,62
Length of a trunk, sm	54,82±4,94	59,06±3,75	60,63±2,90	61,57±5,69	63,00±3,67
Length of a hand, sm	75,36±4,59	79,11±4,13	82,13±3,27	85,17±3,37	84,17±2,92
Length of a shoulder, sm	30,53±2,21	32,17±2,12	34,06±1,91	36,43±1,98	36,50±1,72
Length of a forearm, sm	26,37±2,16	27,83±1,77	28,72±1,64	29,27±1,64	28,38±1,68
Length of a hand, sm	18,89±1,64	19,79±1,33	20,65±1,34	22,20±1,59	21,67±1,39
Length of a leg, sm	92,75±6,23	97,76±5,00	100,54±4,24	103,00±5,49	102,46±5,09
Length of a hip, sm	41,09±3,29	43,35±2,58	45,41±2,43	46,70±2,62	46,38±1,68
Length of a shin, sm	46,42±3,95	48,91±3,49	49,19±4,76	51,13±2,64	51,58±3,20
Length of a foot, sm	27,15±1,37	28,18±0,89	28,38±0,77	28,85±1,14	28,69±0,43

Table 11

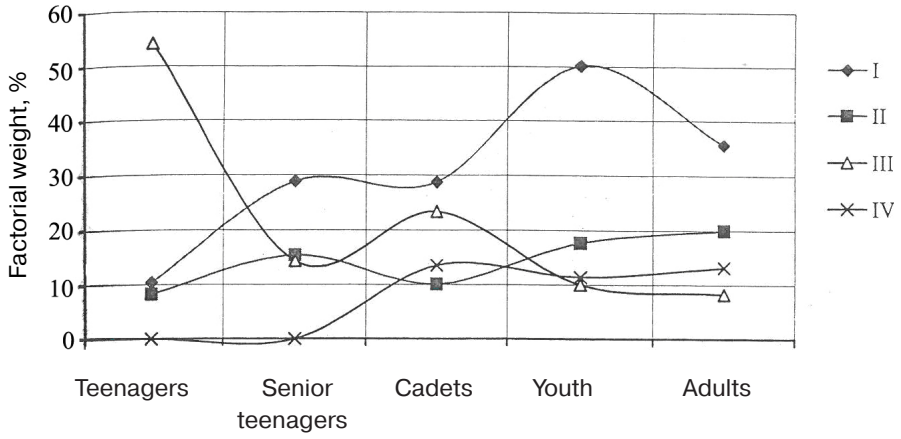
Model indicators of the development of motive abilities in volleyball players of high qualification [4]

Tests	Statistical indicators		
	$\bar{X}$	±S	V
Coordination abilities			
Run by "fir-tree", s	24,55	1,61	6,57
Shuttle run of 4x9 m, s	8,93	0,48	5,33
Power abilities			
Jump up from the place, sm	54,65	7,90	14,45
Long jump from the place, sm	259,12	13,95	5,38
Jump up during the blocking, sm	301,18	11,33	3,76
Throw of a stuffed ball because of the head, sitting, m	14,62	2,08	14,25
Throw of a stuffed ball because of the head, costing, m	19,46	2,08	10,68
Throw of a stuffed ball because of the head, in a jump, m	17,05	2,16	12,69
Pulling up on a crossbeam	10,18	3,41	33,55
High-speed abilities			
Run on 60 m, s	8,01	0,29	3,68

Table 12

Model indicators of development of motive abilities in volleyball players of various age groups, $\bar{X}$±S [11]

Tests	Age group, years				
	13–14 (n=116)	15–16 (n=64)	17–18 (n=51)	19–20 (n=26)	21 … (n=32)
Long jump from the place	217,75±17,84	237,66±15,25	253,63±8,44	256,00±16,19	257,63±13,71
Jump up from the place, sm	51,91±6,50	58,47±5,63	62,05±5,56	55,25±9,08	56,81±7,15
Jump up from running start, sm	57,06±6,10	64,33±5,37	70,32±4,67	68,38±7,65	69,00±6,12
Shuttle run of 3x10 m, s	7,42±0,45	7,12±0,33	6,88±0,24	6,80±0,08	6,79±0,14
Shuttle run of 6x5 m, s	10,63± 0,67	10,06±0,26	9,80±0,19	9,69±0,14	9,72±0,16
Run by "fir-tree" (92 m), s	27,38±1,52	26,03±0,75	25,16±0,77	24,37±1,01	24,68±1,32
Run of 30 m from a high start, s	4,84±0,33	4,61±0,23	4,42±0,21	4,44±0,16	4,44±0,19
Run 10 s on the place, quantity of steps	52,32±5,94	54,05±6,19	57,47±6,25	54,38±3,78	53,56±3,52
Run of 5 min, m	1220,60±102,18	1258,95±91,82	1339,37±101,59	1403,75±58,29	1408,75±49,38
Throw of a ball of 1 kg, m	12,22±2,22	14,88±1,57	17,01±1,40	19,85±2,05	19,52±2,27
Throw of a ball of 1 kg sitting, m	7,12±1,46	8,70±1,29	10,62±2,64	14,34±2,28	14,49±2,18
Throw of a ball of 1 kg in a jump, m	10,17±2,33	12,94±1,34	14,58±1,45	16,81±2,18	17,00±2,48
Pulling up on a crossbeam, time	8,37±3,94	10,50±3,19	13,32±3,84	12,38±4,47	10,75±3,77



Pic. 2. Age dynamics of structure of physical preparedness of volleyball players [11]:
I – high-speed and power abilities; II – explosive force; III – coordination abilities; IV – special endurance

Table 13

Standards of an assessment of the development of motive abilities of volleyball players of various qualifications, $\bar{X}\pm S$

Tests	Sports qualification				
	Master of sport	Candidate of master of sport	I category	II category	III category
Run by "fir-tree", s	25,03±0,16	26,05±0,08	25,18±0,12	28,5±0,15	29,7±0,12
Throwing of a stuffed ball weighing 1 kg sitting, m	8,25±0,18	8,12±0,14	7,98±0,16	7,51±0,08	6,09±0,09
Throwing of a stuffed ball weighing 1 kg in a jump, m	12,96±0,21	12,7±0,16	12,53±0,24	12,43±0,17	9,03±0,17
Reaching of height in a jump, m	2,89±0,02	2,85±0,04	2,76±0,01	2,65±0,45	2,57±0,01
Jumping endurance, time	14,0±0,8	12,3±0,4	10,4±0,5	8,2±0,4	6,6±0,03

Table 14

Standards of an assessment of preparedness of women of master of sport on beach volleyball [3], $\bar{X}\pm S$

Tests	Standards of an assessment
Run on 30 m from a high start, s	4,3 and fewer
Run on 400 m, min	1,12 and fewer
Long jump from the place, sm	241 and more
Jump up from the place, sm	52 and more
Jump up from running start and pushing away of two legs, sm	60 and more
Pulling up in hanging on a crossbeam, time	8 and more
Throw of a stuffed ball weighing 2 kg two hands from behind a head, sm	571 and more
Shuttle run of 3x10 m, s	7,2 and fewer
Run by "fir-tree" (92 m), s	27,0 and fewer

cators – 18 points and close indicators of psychomotor abilities – 8 points and psychophysiological indicators – 8 points in the submitted table of an assessment of sports endowments of volleyball players.

Morphological model characteristics of volleyball players. We will make the characteristic of the total sizes of a body at highly skilled volleyball players according to participants of the World Cups (tab. 4) and the Olympic Games (tab. 5). Indicators demonstrate that the average length of a body of male volleyball players makes 196,0±6,60 sm. Length of a body of the highest team players of Russia made 201,2±6,97 sm. The average body weight of participants of the World Cup made 87,8±7,41 kg. The largest body weight appeared at men of the team of Ukraine: 93,8±7,88 kg. Comparing data of participants of the Olympic Games it is possible to note that length of a body of volleyball players of the victorious team increases over time. Similarly the body weight and the ponderalis index at sportsmen increase from the Olympic Games to the Olympic Games.

The total sizes of a body of women's teams on volleyball – participants of the World Championships are presented in tab. 6. Average indicators of length of a body of sportswomen made 181,5±6,76 sm. The women's team in which the average length of a body of participants was the greatest, was the team of Russia (187,4±5,86 sm). The team of Kenya was the lowest among participants of this championship (average age of volleyball players made 173,4±4,53 sm). Body weight averaged 70,2±5,93 kg. The team of Russia (73,1±2,83 kg) had the largest body weight. Volleyball players of the team of Thailand had the smallest body weight– 63,2±4,88 kg.

We will give also indicators of the total sizes of a body of participants of the Olympic Games (tab. 7). Differential distinctions on body length at volleyball players were from 178,3 sm till 183,5 sm, and body weight – from 68,4 kg till 74,2 kg. The ponderalis index was rather stable (43,58–43,82 c.u.).

According to S. V. Harkusha [4], volleyball players of high qualification of various role have differential distinctions both on length (tab. 8), and on girth indicators (tab. 9). Generally the most considerable data on length anthropometrical indicators are at players of the I and II speed in comparison with volleyball players of other roles (setters and libero). The most considerable grasps of the lower extremities are at libero for the girth of anthropometrical indicators.

The essential distinctions of anthropometrical indicators are observed in various age groups of volleyball players (tab. 10).

Table 16

Standards of an assessment of the development of length of a body and motive abilities at selection of volleyball players at the age of 11–15 years old and sports orientation at the age of 16–18 years old

Indicators	Age, years										
	11	12	13	14	15	16		17		18	
						P	A	P	A	P	A
Length of a body, sm	160	165	175	180	184	186	190	188	192	190	195
Run on 30 m from a high start, s	5,3	5,2	5,1	5,0	4,8	4,5	4,7	4,4	4,6	4,4	4,6
Shuttle run of 6x5 m, s	12,0	11,5	10,5	10,2	10,0	9,8	10,0	9,4	9,7	9,2	9,5
Run on 92 m (fir-tree test), s	29,0	28,0	27,0	26,5	26,0	25,5	26,0	24,2	24,8	23,4	24,0
Jump up from the place, sm	45	50	60	65	70	80	80	84	84	86	86
Jump up from running start, sm	50	56	66	72	78	84	88	90	94	92	96
Throwing of a stuffed ball of 1 kg or 2 kg from the provision of a set, m	5,0	6,2	7,2	8,0	9,0	9,5*	10,0*	12,0*	13,0*	13,5*	14,0*

Note. *P – playing, A– attacking volleyball players; * – the weight of a stuffed ball is 2 kg.*

Table 15

Standards of an assessment of abilities at selection of boys in volleyball, $\bar{X}\pm S$

Test	Age, years					
	10			11		
	Assessment					
	Excellent	Good	Satisfactorily	Excellent	Good	Satisfactorily
Run on 30 m from a high start, s	5,3	5,4–5,7	5,8–6,2	5,1	5,2–5,5	5,6–6,0
Run with change of the direction (6x5 m), s	12,0	12,2–12,4	12,5–12,8	11,8	11,9–12,2	12,3–12,6
Jump up from the place, sm	40	39–33	32–26	42	41–35	34–29
Long jump from the place, sm	165	164–150	149–140	186	185–168	167–150
Two hands costing a throwing of a stuffed ball (1 kg) from behind a head, m	11	10–9	8–6	13	12–10	9–8
Throwing of a tennis ball, m	24	23–20	19–16	26	25–22	21–18

These indicators can be estimated as model characteristics of volleyball players of various age groups.

Model characteristics of the development of motive abilities of volleyball players. As it was noted earlier, the indicators estimating the development of high-speed abilities and high-speed strength of children and teenagers can be informative in the system of sports selection. Practice shows that it is important to estimate as well a predisposition to the development of coordination abilities at a sports selection. Model indicators of the development of these abilities in volleyball players of high qualification are presented in tab. 11. And model indicators of the development of motive abilities of volleyball players of various age groups are given in tab. 12.

The predictive importance of various factors of volleyball players can change with age (pic. 2). So, the highest prognostication of coordination abilities is at youthful age, and during other age periods – explosive force. Special endurance isn't informative in two age periods of youthful age. Since cadet age, the factorial weight of this ability increases.

E. V. Kudryashov [9] recommends using the following standards of an assessment of the development of motive abilities at female volleyball players at various stages of a sports selection (tab. 13).

The standards of an assessment of the development of high-speed, power and coordination abilities, which are presented in the table 14, can be used at a sports selection of volleyball players in national teams of beach volleyball.

Standards of an assessment of motive abilities of volleyball players at the initial stages of a sports selection. Yu. D. Zheleznyak [2] recommends using the program consisting of 6 tests with a three-point scale of an assessment at the initial stages of a sports selection of boys at the age of 10–11 years old in Russia (tab. 15). In Poland W. Jagiello [22] recommends to use the program and standards of a differential assessment at selection of volleyball players at the age of 11–15 years old and sports orientation at the age of 16–18 years old, which are presented in tab. 16.

The above-stated material allows allocating the following **criteria** of determination of motive endowments of volleyball players (men and women). Morphological criteria:

- body length;
- scope of hands;
- features of a structure of a body (active body weight and constitution);
- ratio of length sweeps of various parts of a body.

Pedagogical criteria (criterion of the development of motive abilities):

- power abilities (high-speed force («explosive force»), power endurance, maximum force of separate groups of muscles);
- high-speed abilities (starting speed, remote speed on a short site of a distance);
- coordination abilities (ability to differentiate existential parameters of movements; perception of space; perception of power parameters of movements; spatial and dynamic sensitivity);
- positive dynamics of sports working capacity (sports results);
- optimum age of sports selection and dynamics of sports results;
- high «training» of a sportsman (high adaptation abilities of sportsmen).

Methodological basis of a sports selection of volleyball players is the realization of the following practical tasks:
- formation of model of a high-class sportsman-volleyball player;
- prediction of features of maturing of morphological indicators and development of motive abilities (short-term and long-term);
- organization of a sports selection (regulation of duration of various stages of a sports selection) and distribution of tests at these stages.

Conclusions

1. The generalized concept of sports selection of volleyball players is created.

2. The most significant factors (indicators and abilities) are defined, which are defining endowments of volleyball players. The theoretical mark model of an assessment of a constitution and structure of a body, motive and psychomotor abilities, functionality, psychophysiological indicators is presented in the prediction at volleyball players of predisposition to high sports results.

3. Criteria of high motive endowments of volleyball players are defined.

4. Standards of an assessment of motive abilities of volleyball players are given in the initial stages of a sports selection.

Prospects of further researches

Are connected with the definition of genetic criteria of a sports selection of volleyball players. In particular, they can concern genealogical data, definition of genetic markers of high sports endowments of volleyball players.

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Peculiarities of a backstroke swimming technique acceleration in elementary education

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Purpose*: to research the possibility of intensification and improvement of the efficiency of swimming training for adults by use of accelerated learning backstroke swimming techniques.*

Material & Methods: *the study involved a total of 43 people aged 30–40 years. Applied: analysis and generalization of scientific and methodological literature; analysis of the learning process of swimming training for adults; development and approbation of an accelerated backstroke swimming technique on the base of the recreational sports complex LLC «Technocom» (Kharkiv, Author's swimming school of U. Blyzniuk), teacher observation, experiment.*

Results*: a study shows that developing of swimming skills of people tested occurs faster and more effectively if the accelerated procedure is used. Backstroke swimming skill formation time for examinees: check group had 26 to 36 lessons, there were 25 to 32 exercises with and without use of supporting means; the experimental group had12 to 24 lessons with use of 15 exercises without supporting means.*

Conclusions*: as a result of the experiment, it was found that the use of the proposed accelerated training method allows to intensify backstroke swimming learning process for people aged 30–40, due to training course total duration reduction (2 times) and number of exercises used, and also allows to master quicker the main improving distance according to age of the engaged.*

Keywords: *recreational swimming, training, terms, adults, accelerated method.*

Introduction

Swimming – one of the most widespread, the favourite and constantly developing sports in our country. Today swimming it also a fine mean of active recreation. In many countries of the world swimming is recognized as one of mass and improving means along with such cyclic exercises as walking, run, skies. The increasing role of swimming in comparison with other types of physical activities is in the versatile impact of water on a human body, which is connected with physical, thermal, chemical and mechanical properties of water. During swimming human overcomes water resistance, and it imposes considerable requirements to function of breath, blood circulation, trains physiological mechanisms of thermal control, develops muscles force. In water the metabolism in an organism becomes more active and more energy spends and that is successfully used for decrease in body weight [1; 4; 6–7; 9; 12].

Swimming – an effective remedy of prevention and treatment of cardiovascular and respiratory systems diseases. It is shown also for bearing violations, consequences of the musculoskeletal system injuries. Swimming includes a number of cyclic exercises. All main of muscle groups take part in work, load of them is distributed evenly. In water exercise are carried out smoothly, with a big amplitude, without the body weight pressure upon the musculoskeletal system. It reduces a static stress of muscles and excludes risk of injuries receiving. Swimming increases human body resistance to impact of air temperature fluctuations, tempers the person, develops resistance of an organism to catarrhal diseases [1; 7; 9; 12].

Perfection of biomechanical structure of swimming, availability of mastering its technique, opportunity to dose loading, favorable psychological effect do this type of physical exercises especially valuable to adults.

Among forms of purposeful application of physical culture means for strengthening of health and preservation of active longevity of adults classes in training in swimming in groups of improving swimming gain round [1; 6; 9; 11].

The subject offered for consideration is caused by that quite large number of the adults wishing to visit such groups, but badly swimming or who aren't able to swim annually meets. Mass training in groups of improving swimming has the features since it is necessary to teach adults. The trainer needs to consider anatomical, physiological and psychological features of this contingent. Besides, as a result of numerous and unsuccessful attempts to learn to float, at one a peculiar physiological barrier was already developed, others have hydrophobia, aren't sure of the forces and opportunities. All these factors can affect terms and quality of swimming training of this contingent [1; 2; 4; 6–9; 11].

The intensive rhythm of modern life, numerous duties and cares of the person aged 30-40 leads to that he seeks to seize skill and to gain improving effect from swimming lessons in the shortest time. Publications analysis shows that traditionally created and applied training technique adapts and improves taking into account features of the persons trained. Various sequence of swimming styles training and various terms of their development are offered in practice. Taking into account

variability of trainings terms, one of the priority and actual directions of the theory and practice of swimming training of this contingent are questions of optimization of terms and training technique acceleration [2–6; 8; 9].

The purpose of the research

To research the possibility of intensification and improvement of the efficiency of swimming training for adults by use of accelerated learning backstroke swimming techniques.

Main objectives of research:

1. To generalize experience on training in swimming of adults.

2. To analyze the training methods used to swim and to develop an improved methodology.

3. To reveal a positive effect in formation of swimming skill as a result of accelerated training technique application.

Material & Methods

For solving the main objectives we used the following methods of researches: analysis and generalization of scientific and methodical literature; analysis of educational process of swimming training of adults; approbation of the offered and developed methods of training in swimming with the of the lessons conducted on the basis of a Tekhnokom LLC sports complex in Kharkov (Author's swimming school Y. Bliznuk) organization; pedagogical supervision, experiment, mathematical statistics.

Results and discussion

People who aren't able to swim (i. e. don't float independently 15–25 m) are enlisted on swimming trainings. The program for training of the adults who aren't able to swim is based on a breast stroke and front crawl swimming techniques. Persons aged 30–40 years more often choose a front crawl, and more senior – a breast stroke (since he doesn't demand very high mobility in shoulder and ankle joints). It is best of all to study both ways. When you've already learned swim front crawl and brest stroke (on a breast and on a back), it is possible to alternate them, raising thereby a versatility of influence on the organism. However the final choice of a way remains for engaged since many people have a coordination predisposition to certain movements – in particular, to more effective performing feet movements in front crawl or breast stroke. When determining a way of swimming, age and individual abilities to assimilation of any one way are considered (since adult and elderly people are more capable to assimilation of one swimming way). To establish which way of swimming will easier master a task to try to swim in the known ways is given. Observations and fixation of various hands and feet movements of in original ways of swimming are made, thus, special attention is paid on what feet movements examinees are carrying out. When carrying out our researches, as the main way of swimming skill instilling we used swimming on a back. There are many kinds of such swimming which don't have sports value, however their applicability is indisputable. After long and tiresome stay in water a person can lay down on a back and have a rest. Way of swimming on a back is very economic, and his technical bases are easily transferred to other sports ways [1; 2; 4; 6–10].

Research was conducted during the period from September, 2014 to June, 2015 on the basis of a sports complex of LLC «Tekhnokom» in Kharkov (Author's swimming school of Y. Bliznuk). 43 persons aged 30–40 years which aren't able to swim took part in experiment. Those, who have the initial swimming preparation (ISP) equal from 0 to 5 m – 24 persons. Trainees with IPP of equal 0 m – the 19 persons. Not a one of examinees had skills in back crawl swimming. All trainees were divided into control and experimental groups with 21–22 people in each. Classes in the swimming pool with both of groups were given by same trainer-teacher. Classes frequency – 3 times a week, duration – 45 minutes. Process of training in control and experimental groups consisted of three stages: introductory, initial and the main.

In control group a back crawl swimming technique was studied in traditional way For development of swimming skill at an introductory stage, the preparatory exercises were offered for development with water allowing trainees to examine physical properties of water, to develop feeling of water support, ability to find orientation on water. Trainees got used to feeling of water by walking on swimming pools bottom, knee-bends in water, using of a prone position on a breast and on a back with the supporting means and without ones (poles, noodles, swimming plates were used as the supporting means), lowering of the person in water with closed, and then with opened eyes, sliding.

The introductory stage consisted of 4 lessons, 10–12 exercises were used. At the initial stage started studying back crawl swimming technique and mastered moving in water on a distance of 25 m. This stage was divided into two steps. At first there was a training in movement on a water surface: the engaged were trained in back swimming with the help of feet on shallow part of the pool with and without support; then the movements with support and without it on deep part of the pool were carried out. At the second step of this level the movements of hands with breath were studied; the movements of feet, hands with breath; back crawl swimming in full coordination. Duration of the elementary stage made 12 lessons, 15–20 exercises were used. The main stage began after all trainees could independently, without supporting means, overcome distance of 15–25 meters with back crawl swimming. This stage intended for improvement of the studied way of swimming, and also for preparation for the main health-improving distance overcoming, according to age (for this age category length of an health-improving distance makes 600–800 m). Duration of the main stage made 10 lessons. On the last lesson of this stage there was a test of 30-minute swimming for range of the floated distance, which helped to define the stability of the examinees acquired skill. Duration of all three studying stages for the control group amounted to 26 lessons [2,4,5].

Development of floating skills and acceleration of the learning process are possible both with the help of auxiliary technical means (pole, "noodles", rubber rings and other supporting means), and without any of those [2-5,8-11]. For the purpose of acquiring swimming skills a method of accelerated teaching of backstroke swim was applied to the control group. This method had been successfully used for teaching students [8]. The most effective exercises were selected out of many different suggested in handbooks [2-6, 8], according

to the experience of many years of teaching. The main criterion was to avoid using any kind of supporting means. During the introductory stage the control group was given following exercises:

– "Float on the back", hands "locked" (slowly lay back, with hands joined. Keep this position for a while, then relax hands, dis-join and place along the body. Joining hands behind the back provides stability due to a lower center of gravity.)

– Figure-eight loops with one or two hands (draw eights horizontally. Breathing should be in sync with hands)

– Figure-eight loops with both hands over deep water (legs down, not touching the bottom. Inhale on diverging hands, exhale on converging)

– Bottom push gliding, hands along the body (arbitrary breathing. Advanced option: starting position with hands stretched above the head)

– Side push gliding on the back, hands along the body (inhale, hold breath; push with the legs and glide until stop, use mouth breathing. Advanced option: starting position – straight hands over the head)

– Bottom push gliding + figure-eight loops.

Using these exercises, in just 2 days students were able to float in horizontal position by themselves and breathe normally, as well as perform various gliding exercises on their back

During the elementary stage following exercises were given:

– Figure-eight loops with translation ("float on the back", hands "locked"; perform figure-eight loops at the level of hips, swimming several meters. Rhythmic breathing, in sync with hands movement; legs strait and relaxed)

– Movements of legs (perform "float on the back", hands "locked", alternating movements of legs in the vertical plain)

– Figure-eight loops and movements of legs (perform "float on the back", hands "locked"; perform figure-eight loops at the level of hips, swimming several meters with strait legs; then swim several meters working with legs like when swimming crawl. Rhythmic breathing, in sync with hands movement)

– "Torpedo" on the back

– Gliding, figure-eight loops and legs movements as in crawl stroke (push, glide 1-2 meters, perform "eights" with hands, then add legs movement. Rhythmic breathing, in sync with hands movement

– Back stroke without taking hands out of the water (lay back, perform several figure eight loops with hands, add legs movement. Bend hands in water and reach up above the head, with palms facing up, after that perform the stroke down to the hips)

– Back stroke swimming with a simultaneous stroke to hips

– Faking alternating stroke on shallow water

– Swimming crawl on the back with full body control

The elementary stage was over after 5 lessons, since every student could confidently cover the distance of 25 meters swimming on their back, and could stay afloat for more than 20 minutes. For both experimental and control groups the

Table 1

Comparison of the results of traditional back stroke crawl training (with the help of supporting means) and the accelerated training methodology (without any supporting means) applied to adults (30-40 years old)

Metrics	Groups		t	p
	CG (n=22)	EG (n=21)		
Initial swimming ability (m)	0–5	0–5		
Initial stage				
Lessons	4	2		
Exercises	10–12	6		
Elementary stage (distance 25m)				
Lessons	12	5		
Exercises	15–20	9		
Кол-во метров	17±1,65	27±2,38	3,46	<0,01
Main stage (recreational distance 600-800m)				
Lessons	10	5		
Exercises	10	10		
Distance covered during a 30 minute test (m)	657±17	747±9	4,68	<0,001
Total number of lessons	26	12		

main stage has started, when students had to improve their swimming technique to cover the main recreational distance according to their age. In the experimental group the duration of the main stage was 5 lessons. Just like in the control group, a 30 minute swimming test was conducted to determine the quality of acquired skills.

The test has shown that students of both control and experimental groups have acquired the necessary skills for back stroke crawl swimming (see Table 1).

As can be seen from the Table 1, the experimental group had much more success at acquiring skills of back stroke crawl swimming. The total duration of the course for the control group was 26 lessons, 35–42 exercises were used - both with and without supporting means. In the experimental group much less time was needed to gain the skill of back stroke crawl swimming. The three stages were covered in 12 lessons, 25 exercises without supporting means were used. The elementary stage test of swimming 25 meters with back stroke crawl showed unsatisfactory results in the control group of 17 m in average, while in the experimental group the result was 27 m (avg). The average result of the final 30 minute testing in experimental group was 747 m, 90 m more than in the control group (675 m).

Conclusions

As a result of the experiment, it was found that the use of the proposed accelerated training method allows to intensify backstroke swimming learning process for people aged 30–40, due to training course total duration reduction (2 times) and number of exercises used, and also allows to master quicker the main improving distance according to age of the engaged.

Prospects for further research

It is necessary to develop detailed practical guidance for coaches working with the contingent that will speed up the process of teaching adults to swim and improve the course efficiency.

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Concerning rather modern organizational innovations in the system of physical education of student youth

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Purpose: *studying of attitude of students to the existing system of physical education in higher educational institutions of Ukraine and an assessment of possible consequences of implementation of the order of MES of January 26, 2015 No. 47 and the corresponding explanations and recommendations to it which are stated in the letter of MES No. 1/9-1126 of 13.03.2015.*

Material & Methods: *the poll of students of 1–4 courses (n=757) of one of the faculties of Law University named after Yaroslav the Wise (NLU) was conducted for the achievement of the stated purpose. Health cards of students, log-books of educational work on physical training of students, log-books of work of sports and improving sections were also analyzed.*

Results: *interest in classes by physical exercises decreases at the vast majority of students during training in higher educational institutions. 88,6% of students note a need of carrying out classes on discipline "Physical education" for higher educational institutions. The majority of them (80,2%) will choose discipline "Physical education" if it will be optionally, and 71,9% understand that they need to be engaged in physical exercises 4-6 hours per week for maintenance of the appropriate level of their physical health.*

Conclusions: *the positive result of functioning of the existing system of physical training of student's youth will be shown that interest in classes by physical exercises decreases at the vast majority of students during training. The effective modernization of the system of physical training of student youth is possible, first, due to use of the existing gender distinctions in interests in classes by physical exercises at students. Secondly, due to properly organized classes with the students who are for health reasons to preparatory (10,9%), special (19,1%) medical groups and MPC groups (3,4%). The considerable issues will appear with visit of such classes by students in case of a removal of classes on physical education of students in the department of facultative classes.*

Keywords: *physical education of students, physical health, physical activity, physical-sports activity, sectional classes, requirements, motives, polls, distinctions.*

Introduction

Socio-political changes which happen in Ukraine concern all parties of social being, including spheres of physical culture and sport which was created for this time. In this process the important place is allocated to reforming of the system of physical education of student's youth, according to leading experts, it is insufficiently effective concerning providing an optimum level of physical health of students, and techniques of the organization and carrying out classes on physical education of students in HEI need the subsequent improvement [1; 3; 4; 7]. The solution of the noted problems as shown the analysis of scientifically methodical literature [10], lies in the plane of a reorientation of the educational process which is developed within a realization of the discipline "Physical education", from mainly physical improvement of students which is represented dominating, in the direction of education at student's youth of a personal responsibility for a condition of health, formation at them the positive and effective relation to classes by physical exercises, to maintaining a healthy, physically active way of life, that is formation at them the appropriate level of personal physical culture. Such approach will provide the solution of basic tasks of the system of physical education of the students, which are stated in Laws of Ukraine "About education", "About higher education", "About physical culture and sport", in the Concept of national education of student's youth and in the Provision on the organization of physical education and mass sport in higher educational institutions. However other strategy of modernization of the system of physical education of students is chosen cardinally. So, the attention to a possibility of removal of classes on physical education of students in the section facultative was focused in the letter of MES No. 1/9-1126 of 13.03.15 "Concerning features of the organization of the educational process and the formation of curricula in the 2015/12016 academic year" (that is at the request of students; and to curricula don't join in total number of the credits of EKTS, have no forms of total control). The offered MES of action didn't get an appropriate support in the circle of experts who work in the sphere of physical culture and sport. Responding to their numerous appeals, the Ministry of youth and sport together with the Ministry of Education and Science was initiating the creation of the Interdepartmental working group of modernization of the system of physical training of student's youth [6]. The recommendations con-

cerning the organization of physical education in higher educational institutions are provided [2] and the basic models of the organization of the educational process are also offered (section, professionally focused, traditional, individual) by the results of the work of this group the Ministry of Education and Science of Ukraine. MES also supported the list of the general competence for getters of higher education of different degrees which are offered by National university of physical education and sport of Ukraine. It gives a certain hope concerning prospects of modernization of the system of physical education of students in higher educational institutions of Ukraine and also information which is stated in the message of the press-cutting service of the Ministry of Education and Science of Ukraine from 12/7/2015 "Concerning the development of physical education and sport in higher educational institutions" in which the corresponding explanations of rather key questions are offered which have arisen in the course of implementation of the order of the Ministry of Education and Science of January 26, 2015 No. 47 "About features of formation of curricula for the 2015/2016 academic year".

It is obvious that the organizational innovations which are stated above can be effective only at an appropriate perception of their student's youth for which they are actually also entered.

The purpose of the research

Proceeding from the aforesaid, the purpose of article is studying of the relation of students to the existing system of physical education in HEI in Ukraine and the assessment of possible consequences of implementation of the order of the Ministry of Education and Science of January 26, 2015 No. 47 "About features of formation of curricula for the 2015/2016 academic year" and the corresponding explanations and recommendations to it which are stated in the letter of MES No. 1/9-1126 of 13.03.15 "Concerning features of the organization of the educational process and the formation of curricula in the 2015/12016 academic year".

Communication of the research with scientific programs, plans, subjects

The research is executed within the implementation of the scientific project of MES of Ukraine "Theoretic-methodical principles of formation of culture of physical health at student's youth" (number of the state registration: 0115U006767).

Research task:

1. To analyze scientifically-methodical literature concerning the problem of providing an optimum level of physical health of students and the normative documents of modernization of the system of physical education of students which are offered by MES in 2015.

2. To estimate the relation of students to possible consequences of implementation of the order of the Ministry of Education and Science of January 26, 2015 No. 47 «About features of formation of curricula for the 2015/2016 academic year".

3. To generalize a state and prospects of functioning of the existing system of physical education of student's youth on the basis of the carried-out analysis of the relation of students to the existing system of physical education in higher educational institutions, taking into account results of the previous researches.

Material & Methods

The poll of students of the 1-4 courses (n=757) of one of faculties of Law University named after Yaroslav the Wise (NLU) was conducted for the achievement the stated purpose. The questionnaire of the closed type was used. Medical cards of students who study at this faculty, study log-books on physical education of students of the same faculty, log-books of work of sports and improving sections were also analyzed which function at the faculty.

Results and discussion

The results of the conducted sociological research are presented in the table. They show the following. 36,6% of students estimate the level of the physical health as high, 49,2% – as average, 7,5% – as satisfactory on average on all selection (that is total average result of poll of students of NLU). The results of poll also indicate the existence of certain differences in such estimates between male students and female students (the tab., the question 1). So, for example, 47,5% of students of the legal university estimate the level of the physical health as high, and 39,8% – as average. Considerably the lowest assessment of level of physical health at female students. Only 25,8% from them estimated it as high. Overwhelming most of the interrogated female students of NLU (58,6%) regard the level of the physical health as average. The received results are confirmed by the materials which are stated in the previous article [4]. The above-stated data speak about a rather high assessment of the level of physical health by students. They not fully correlate with objective results of medical reviews. So, for example, 66,2% of students who study at the first year of NLU are carried to the main group, 10,9% – to the preparatory and 19,1% – to the special, and 3,4% to MPC group. At the same time 90% from this number of students and 82,8% of female students regard the level of physical health as high and average. The fact pays attention to itself also that the number of students who, in their opinion, have the high level of physical health decreases during a study in NLU. Such tendency in answers is characteristic as of boys (at the first year such 50,0%, on the second – 65,0%, on the third – 36,2%, and on the fourth – 38,8%), and of girls (at the first year such 31,4%, on the second – 46,0%, on the third – 18,5%, and on the fourth – 7,4%). The noted regularity is perhaps connected with the essential decrease in the level of physical activity of students of older years which is caused by the lack of systematic classes on physical exercises that was provided within discipline the "Physical education". This thesis is confirmed by the fact that the vast majority of students (67,3%) are engaged in physical exercises (or were engaged what results of the poll of students of older years testify to) only on classes on physical education (the tab., the question 2). 67,3% of respondents answered "yes" Among students of NLU. A similar tendency in answers is observed also among female students, respectively 67,0%. This situation authentically causes the fact that 88,6% of students who took part in the poll, noted a need of carrying out of classes on the discipline "Physical education" at HEI (the tab., the question 3). And this tendency is characteristic as of male students (87,9%), and female students (89,4%), and also of the most of students of older courses of NLU (at the first year such students of 83,4%, on the second – 93,0%, on the third – 80,8%, and on the fourth –

Features of perception by students of the legal university of high school system of physical education of %

№	Questions and variants of answers	Male students					Female students					Average value on all selection
		I course n=103	II course n=98	III course n=89	IV course n=68	$\bar{X}$	I course n=140	II course n=115	III course n=76	IV course n=68	$\bar{X}$	
	How do you estimate your level of physical health?											
1	A) high	50,0	65,0	36,2	38,8	**47,5**	31,4	46,0	18,5	7,4	**25,8**	**36,6**
	B) average	40,0	27,0	42,5	50,0	**39,8**	51,4	46,0	59,3	77,8	**58,6**	**49,2**
	C) satisfactory	6,6	8,0	19,1	11,1	**11,2**	17,2	8,0	18,5	11,1	**3,7**	**7,5**
	D) difficult to answer	3,3	–	2,1	–	**1,3**	–	–	3,7	3,7	**1,8**	**1,5**
	Are you engaged in physical exercises (were engaged) generally on physical education classes?											
2	A) yes	86,8	72,0	66,0	44,4	**67,3**	60,6	78	70,4	59,3	**67,0**	**67,2**
	B) no	6,6	25,0	34,0	38,9	**26,1**	11,4	10,0	29,6	22,2	**18,3**	**22,2**
	C) irregularly	6,6	3,0	–	16,6	**6,5**	2,8	12,0	–	18,5	**8,3**	**7,4**
	Is it neseccary to have classes on the discipline «Physical education» at the university?											
3	A) yes	83,4	93,0	80,8	94,5	**87,9**	94,3	82,0	88,9	92,6	**89,4**	**88,6**
	B) no	16,6	7,0	19,2	5,5	**12,1**	5,7	18,0	11,1	7,4	**10,5**	**11,3**
	If the discipline «Physical education» will be by the choice, do you chose it?											
4	A) yes	86,7	92,0	76,6	77,7	**83,2**	85,7	68,0	70,4	85,2	**77,3**	**80,2**
	B) no	13,3	8,0	23,4	22,2	**16,7**	14,3	32,0	29,6	14,8	**22,6**	**19,6**
	How many hours per week do you need to be ebgaged in physical exercises for support an optimum level of your physical health?											
5	A) 2 hours	10,0	27,0	8,5	22,2	**16,9**	25,7	11,0	11,1	14,8	**15,6**	**16,2**
	B) 4–6 hours	70,0	61,0	68,1	49,9	**62,2**	65,7	85,0	66,7	70,4	**71,9**	**67,0**
	C) more than 6 hours	20,0	12,0	23,4	27,7	**20,7**	8,6	4,0	22,2	14,8	**12,4**	**16,5**
	Classes on physical education of students have to be hold in at the university:											
6	A) as the discipline in a lesson schedule	73,4	58,0	59,6	44,4	**58,8**	65,7	43,0	70,4	40,7	**54,9**	**56,8**
	B) as open classroom out of a lesson schedule	26,6	42,0	40,4	55,6	**41,1**	34,3	57,0	29,6	59,3	**45,0**	**43,0**

Continuation of the table

№	Questions and variants of answers	Male students					Female students					Average value on all selection
		I course n=103	II course n=98	III course n=89	IV course n=68	$\bar{X}$	I course n=140	II course n=115	III course n=76	IV course n=68	$\bar{X}$	
	What kind of form of classes did you chose within the discipline «Physical education»?											
7	A) classes in groups of physical esucation on the program which is directed to increase of the level of your physical preparedness on the basis of use of means of the main gymnastics, fitness, step-aerobics, stretching, cheerleading, sports aerobics	23,3	30,0	19,1	38,9	**27,8**	57,1	61,0	59,3	44,4	**55,4**	**41,6**
	B) classes in groups of physical education on the program which includes use of game sports, swimming, track and field athletics, table tennis, athletic gymnastics, dancing and gymnastic sports,	50	50,0	51,1	27,7	**44,7**	34,3	32,0	25,9	37,0	**32,3**	**38,5**
	C) classes in groups of sports education (specialization in the shosen sport)	26,6	20,0	29,8	33,3	**27,4**	8,6	7,0	14,8	18,5	**12,2**	**19,8**
	What does encourage you to be engaged in physical-sport activity?											
8	A) desire to increase physical preparedness	73,4	57,0	46,8	50,0	**56,8**	37,2	21,0	48,1	33,3	**34,9**	45,8
	B) to optimize weight, to improve a constitution	6,6	27,0	23,4	27,7	**21,2**	42,8	64,0	33,3	33,3	**43,3**	32,2
	C) to take off fatigue and to increase working capacity	10,0	13,0	8,5	–	**7,8**	8,6	11,0	14,8	14,8	**12,3**	10,0
	D) in time to pass a test from the discipline «Physical education» E) it is difficult to answer	10,0	3,0	14,9	22,2	**12,5**	5,7	4,0	3,7	14,8	**7,1**	9,8
	F) desire to increase physical preparedness	–	–	6,4	–	**1,6**	5,7	–	–	3,7	**2,3**	1,9
	Did your interest in classes on physical exercises change durina a study at the university?											
9	A) increased	56,6	30,0	42,6	50	**44,8**	51,5	46,0	51,8	37,0	**46,6**	**45,7**
	Б) remained withot changes	40,0	66,0	42,5	44,4	**48,2**	45,7	50,0	48,1	62,9	**51,6**	**49,9**
	B) decreased	3,3	4,0	14,9	5,5	**6,9**	2,8	4,0	–	–	**1,7**	**4,3**

94,5%). Similar results are recorded also in the course of the poll of female students (respectively 94,3%, 82,0%, 88,9%, 92,6%). The results of the research demonstrate also that on average on all selection of 80,2% of students will choose the discipline "Physical education" if it is by the choice (the tab. the question 4). Such thought is supported by the vast majority of male students (respectively 86,7%, 92,0%, 76,6%, 77,7%) and female students (respectively 85,7%, 68,0%, 70,4%, 85,2%) who study on different courses of NLU. The received results can be regarded as a position of students which consists in need of introduction on older courses disciplines "Physical education" in HEI. And most of male students (62,2%) and female students (71,9%) of NLU is conscious the fact that they need to be engaged in physical exercises of 4-6 hours for a week for support of the appropriate level of their physical health (the tab., the question 5). The results of the research also show that students who took part in the poll were divided almost equally in the relation to possible forms of the organization of classes on physical education (the tab., the question 6). 56,8% of respondents consider that they have to be carried out as a subject matter in a lesson schedule, and 43,0% – as an open classroom out of a lesson schedule. The assessment of a form of the organization of classes on physical education is noted, which is peculiar as for male students (58,8% and 41,11%), and for female students (in 54,9% and 45,0%).

The effective organization of the system of physical education of students is possible only on condition of the accounting of their requirements and tastes concerning the choice of a type of sports activity. The results received during the research allow to state the existence of the expressed gender differences (the tab., the question 7). So, female students of NLU (55,4%) are more inclined to classes in the program which is directed to increase of the level of their physical preparedness on the basis of use of means of the main gymnastics, fitness, step-aerobics, stretching, cheerleading, sports aerobics, and male students (44,7%) – to classes in the program which includes the use of game sports, swimming, track and field athletics, table tennis, athletic gymnastics, dancing and gymnastic sports. The provided data are confirmed by the materials of the previous researches [11]. The results of the conducted questionnaire also indicate that the considerable part of students of NLU (27,4%) would like to specialize in the chosen sport. Such is much less – 12, % among female students The provided data are generally confirmed by materials of the previous researches [10]. However the results of the analysis of log-books of work of sports and improving sections which function at the faculty, demonstrate that only 29,0% are engaged among the first-year students in such sections, on the second year of such students is much less – 9,6%, on the third – 8,0%, and on the fourth – 3,9%. Only 9,7% are engaged in sports improving sections on average among students who study on the 1–4 courses of the faculty. The provided data indicate that, despite of enough powerful sports base of NLU, only a insignificant part of students use it in the form of section classes. They also demonstrate the existence of a certain contradiction between awareness of need of systematic classes by physical exercises by students and their practical activities in this direction.

The analysis of motives which can induce students to active classes by physical exercises shows the following (the tab., the question 8). Among students of NLU (56,8%) the first by a rating is "the desire to increase physical preparedness". The more significant for female students is the factor "to optimize weight, to improve a constitution", it was preferred by 43,3% of respondents. The obtained data are generally confirmed by the materials of the previous researches [8; 11]. The results of the poll of students demonstrate also that offset on the discipline "Physical education" isn't represented the defining factor which induces them to be engaged in physical exercises. It was preferred by only 9,8% of respondents on average on all selection. The results of the research also certify that interest in classes by physical exercises increases only at 45,7% of students, in 49,9% it remains without changes and only in 4,3% of students it decreases during a study in HEI (the tab., the question 9). The obtained data are generally confirmed by the materials of the previous researches [9]. Therefore, the given results allow to note that interest in classes by physical exercises doesn't decrease at the vast majority of students during a study in NLU (it lowered only in 4,3% of students) that can be considered as the positive result of functioning of the operating system of physical education of student's youth.

Conclusions

The carried-out analysis of the relation of students to the existing system of physical education in higher educational institutions, taking into account the results of the previous researches, allows to draw the following generalizing conclusions:

1. Interest in classes by physical exercises doesn't decrease at the vast majority of students during study in HEI that can be regarded as the positive result of functioning of the existing system of physical education of student's youth. It opens broad prospects for its modernization including by the following directions.

First, due to the use of the existing gender distinctions in interests in classes by physical exercises at students. Such approach is caused by the fact that the major factor motivating them to classes with physical exercises is "the desire to increase the physical fitness" among students (56,8%) which stimulates 44,7% from them to classes in groups of physical education by the programs which would include the use of game sports, swimming, track and field athletics, table tennis and sports of the gymnastic direction (athletic gymnastics, dancing and gymnastic sports and others). Only 27,4% of students are interested in classes in groups of sports education (specialization in the chosen sport). The more significant is the factor of "optimization of weight, improvement of a constitution" for the considerable part of students (43,3%). It motivates most of students (55,4%) to classes in groups of physical education by the programs which include the use of means of the main gymnastics, fitness, step-aerobics, stretching, cheerleading, sports aerobics. Only 12,2% of students are interested in the specialization in the chosen sport.

Secondly, considering the fact that the considerable part of the first-year students is carried to preparatory (10,9%), special (19,1%), medical groups and MPC groups (3,4%) by the results of medical reviews, it is necessary to organize a special rank of classes with such students (perhaps in separate groups), having involved the corresponding specialists in number of employees of departments of physical education and normalizing properly their study. The simultaneous stay in group on classes in the discipline "Physical education" of students of the main, preparatory and special medical groups

that really exists, it considerably complicates a work of a teacher. Without a solution of this problem it is impossible to speak about the efficiency of physical education of students in higher educational institutions of Ukraine.

2. The results of the research showed that 88,6% of students note a need of carrying out of classes in the discipline "Physical education" for higher educational institutions. The vast majority of them (80,2%) will choose the discipline "Physical education" if it is by the choice, and 67,0% conscious the fact that they need to be engaged in physical exercises of 4-6 hours for a week for support of the appropriate level of their physical health. The provided data confirm awareness of need of systematic classes by students physical exercises, however only 9,7% of students are engaged in sports improving sections. Therefore there is a certain contradiction between awareness of need of systematic classes of physical exercises by students and their practical activities in this direction. It is possible to solve it due to renewal on older courses of HEI the discipline "Physical education". This offer is supported mediately by the vast majority of students of older courses. In it, just also has to consist, despite of financial crisis, a state policy in the sphere of physical education of students which is directed as normative documents testify, on providing the optimum level of their physical activity, the formation of understanding of values of a healthy lifestyle in them, the creation of optimum conditions for their self-realization in the sphere of physical culture and sport.

3. It is necessary to consider the fact that the vast majority of students (67,2%) are engaged in physical exercises (or were engaged) only (!) on classes on physical education in the course of modernization of the system of physical education of student's youth. Only about 9,7% of students who study on the 1–4 courses, visit sports improving sections. Proceeding from these results, it is possible to make the reasonable assumption that problems will be with visit of such classes by students in case of the direct implementation of the order of the Ministry of Education and Science of January 26, 2015 No. 47 "About features of formation of curricula for the 2015/2016 academic year", that is removal of classes on physical education of students in the section of facultative. It will mean, quoting the message of the press- cutting service of the Ministry of Education and Science of Ukraine from 12/7/2015 that "rumors nearly about death of physical culture in Ukrainian HEI" will turn into reality.

Prospects of the subsequent investigations

The development of basic modules to the program on discipline "Physical education" is planned in the subsequent, in what the existing gender distinction at students in their interests in classes by physical exercises would be considered.

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Organization and carrying out the triathlon competitions in Ukraine

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Purpose: *the aim is analyzing of system of organization and carrying out the triathlon competitions in Ukraine in accordance with rules of triathlon international federation.*

Material & Methods: *comparative analysis of process of organization and carrying out the triathlon competitions in the world and Ukraine was carried out on basis of specialist literature studying, normative base of sports organizations (triathlon federation).*

Results: *inconsistencies were identified in competitions carried out in cold season, particularity of triathlon that intends overcoming the combined distance without time durations between stages.*

Conclusions: *recommendation in eliminate inconsistencies that affect to performance of triathlon competitions in Ukraine was suggested.*

Keywords: *triathlon, transit zone, swimming segment, cycling segment, running segment, handicap.*

Introduction

Nowadays competitions in convention of the combined distances by means of different types of physical activity gained the increasing popularity among all age groups of the population in the sporting world [9]. Preparation and participation in competitions in types of the program of thriathlon – is one of the most perspective directions of the development of physical culture and mass sport in our country [4].

The Federation of thriathlon of Ukraine (FTU) holds a number of the All-Ukrainian competitions according to the Unified planned schedule of physical-sports events in Ukraine (UPSPSEU) within a year. The number of starts increases every year, and the geography of their carrying out covers all new regions of the country. So, recently UPSPSEU included till 22 sporting events on this sport annually. However the questions concerning conditions of the organization and competitions in types of the program for the continuous triathlon under the auspices of FTU, and also compliance to their rules of the International Federation of thriathlon (ITU) and the European Federation of a thriathlon (ETU) are far not completely studied [2; 13; 14].

Communication of research with scientific programs, plans, subjects

The research is executed according to the Thematic plan of the research work of Kharkov state academy of physical culture for 2013-2015.

The objective of the research

To analyse the system of the organization and continuous triathlon competitions in Ukraine on compliance to the rules of ITU and ETU.

Research problems:

1. To open conditions of the organization and competitions in thriathlon on the basis of the international rules.

2. To define the compliance of competitions by the form of the program of thriathlon in Ukraine to rules of the International and European federations.

3. To prove the need of creation in Ukraine of the corresponding sports infrastructure for carrying out competitions in the continuous overcoming of the combined distance in a cold season.

Material & Methods

1) the studying and synthesis of data literary and Internet sources, normative documents of ITU, ETU, FTU and other international federations for an assessment of the degree of a study of a problem and allocation of the key provisions which are the cornerstone of the competitive process in thriathlon;

2) the comparative analysis of conditions of the organization and competitions by the form programs of thriathlon abroad and in our country for the purpose of the identification in them the essential distinctions influencing the sports results which are shown by triatlets when they pass the combined distance.

Results and discussion

Conditions of carrying out competitions in continuous triathlon are identical both to men, and to women (often they are carried out in common).

As competition by the form programs of thriathlon represents an overcoming of the combined distance by means of swim-

ming, cycle driving and run in continuous sequence, than the rules of behaviour of triatlets on separate pieces of the route don't differ from those in the corresponding sports. Specifics are mainly observed only in group swimming on open water and when passing by athletes of the transit zone where change of stages of triathlon (types of sports activity) is carried out.

Rules of competitions are urged to approve the principle of a fair play, to create equal conditions for all participants and to ensure their safety.

Everyone triatlet has to be acquainted with requirements which are imposed to a behavior of a sportsman at a distance as ignorance doesn't exempt from liability for their non-compliance.

Duties of a triatlet:

- to combat in the spirit of the honest sports rivalry;
- to follow instructions of referees;
- to be responsible for own safety and safety of other sportsmen;
- to behave politely in relation to people around (triatlets, referees, volunteers, the audience), to avoid rough and offensive expressions, and also indecent gestures;
- to inform referees in case of a descent from a distance [4].

Requirements to sport stock and equipment of a triatlet. ***The obligatory equipment*** of a sportsman in competitions by the form of the program of thriathlon consists of a swimming suit, a helmet (on safety conforming to the international standard), running sneakers, and also the clothes covering a torso on velo - and running segments.
However in practice triatlets, as a rule, use the special starting suit combining a swimwear and clothes for a torso (only at short distances).

Sports bicycles are usually used to road cycling at a cycle stage. Short «plank beds» on the drafting distances (short distances where leading is authorized at a cycle stage) is allowed for use [7]. Thus «plank bed» shouldn't play forward for the line connecting extreme parts of brake handles (the additional design mounted on a bicycle wheel, serving for change of position of a body of a cyclist for the purpose of the improvement of his aerodynamic opportunities).

They use in the form of the ***additional equipment*** on competitions in continuous triathlon: swimming points, cycle shoes with contact pedals, cycle flasks, cycle points, cycle gloves, a diving suit (thickness no more than 5 mm), a zone thong (for fastening of the main number), and in case of a especially hot weather – kepi for run [3].

The forbidden equipment: glass bottles, earphones, cell phones.

Before the start. It is announces about opening of a transit zone beforehand before the start. Transit is the fenced site where there is a change of stages of competitions. It is arranged in such a way that all triatlets overcome identical distance at its passing. The individual place for storage of equipment and sport gear according to his starting number is allocated for each sportsman in a transit zone.

Previously before competitions a triatlet is obliged to provide to referees his bicycle for technical inspection (together with means of individual protection – a helmet), and to undergo a procedure of prestarting registration: to show a identification paper, the license of federation, an insurance, a receipt on payment of a starting contribution (on commercial starts), the certificate of a state of health to a referee's board. An athlete is obliged to certify by the personal signature the document on the personal responsibility for health and to assume all risks connected with participation in the continuous triathlon in case of the absence of a medical certificate. After the registration and receiving a starting package the personal number assigned to a sportsman is applied on shoulders and an athlete's shins by the waterproof marker by the referee's. Only after it a participant can enter in transit and place his sports accessories in the place corresponding to his starting number. The bicycle is set on a special stage, and all other equipment of an athlete is located in the basket which is standing nearby (as a rule, it is provided by organizers of competitions).

It is contained in the provided starting package:

- a number on a bicycle (it is fastened around the subsaddle probe);
- numbers on a helmet (they are pasted ahead and on each side);
- a rubber hat with the starting number which is put on it (it is put on a head before overcoming of the swimming stage);
- the main number (it is fastened to a zone thong or to an elastic band), it has to be behind at a cycle stage, and on the running segment – in front on an athlete's body;
- the special chip (it is given and fastened in an anklebone of a participant, if the route of competitions is equipped with the corresponding equipment) reporting to the computer about a location of an athlete and change of thriathlon stages by it [3; 12].

It is forbidden to take others place and to touch things of other sportsmen.

The access to transit stops just before the start. It is possible to appear in it again only at a distance or after the end of competitions.

Having taken the swimming equipment, triatlets removed to a start place.

The swimming segment. Competitions by the form of the program of thriathlon begin with swimming.

The swimming stage, as a rule, is carried out on open water – the lake, the sea, the canal or the small river. The distance in a reservoir is designated by cables with noticeable buoys and usually has a triangular form.

The use of diving suits is allowed in case of the lowered water temperature (surely, if below 14 °C). Participants, having put the hats on heads, which are given out by organizers of competitions (a swimmer isn't punished for its loss during a race), aligned on a beach, a floating pontoon or a pier. There can be some ranks depending on quantity of triatlets. After a shot of the starting gun all direct in water at the same time (competitions can be organized as uniform start and in the form of several "waves" if total number of participants is great). The swimming distance is overcome by sportsmen against the movement of an hour hand, i.e. from the right to the left.

It is allowed to use any way of swimming (depending on preferences of a participant), and in case of need – to hold anchor buoys.

The swimming segment, as a rule, consists of several «circles» at long distances.

A triatlet has the right to raise a hand and to ask about the help at the critical moments (rescuers accompany sportsmen on watercrafts during swimming on open water).

Free reduction of length of a route, and also preventing the movement of other swimmers (to block, to heat or to hold them), use of additional subjects (flippers, vests, etc.) are forbidden [2; 4; 14].

The first transit. The observance of an order of change of stages is strictly regulated therefore athletes get out of water on the coast and go to the place in a transit zone on the end of a swimming segment. There, having put the swimming accessories they removed from themselves in a basket, put on the equipment necessary for the second stage – cycle racing, and the main number (it has to be behind on a body). The helmet has to be put on and clasped before a participant takes his bicycle and will run with it to the exit from a transit zone.

It is forbidden to be bared, and also to interfere with other athletes at disguise and in the course of preparation of bicycles for a race [3].

The bicycle segment. Sportsmen get on bicycles (a movement on them in transit is inadmissible!) and go on overcoming of the second stage of thriathlon at the exit from the transit zone.

Recently the cycle stage is carried out on difficult routes with the existence of rises and descents at competitions of the high level (a complication of the cycle route is carried out for the purpose of a fuller disclosure of opportunities of participants of a race).

Drafting is resolved at short distances, and it is forbidden on long distances [1; 6; 7]. Now (since 2006), the zone of "alienation" makes 7 meters behind at the leading ban at the cycle stage and 2 meters from the cyclist going ahead to the right-to the left. A maneuver of an overtaking has to be complete within 60 seconds at an advancing.

The bicycle segment consists, as a rule, of one "circle" at short distances (Olympic and less) and on long – of several (on 20–40 km depending on district conditions).

Points of food and station of technical assistance are located on the way of the movement (the bicycle racers eliminate all arisen malfunctions).

The driving with a naked torso and without helmet, and also the movement of a sportsman without a bicycle are forbidden. A sportsman can walk or run, conducting a faulty bicycle or bearing it on itself [2; 4; 14].

The second transit. Finishing a distance of a cycle race, triatlets come back to the transit. Having dismounted before its entrance and holding a bicycle by a hand, they run go to the place in a transit zone. There participants of competitions set a bicycle on a special stage and only again after that take off a helmet from a head. Having put a bicycle equipment in a basket, having put on feet of a sneaker and having moved on a body a zone thong (elastic band) with the main number so that it was ahead, sportsmen go on a running distance.

The running segment. The third stage of competitions – run – begins directly in a transit zone from an individual place of a sportsman in the direction, most often opposite to the cycle stage. The route of the running segment lies on a hard coating (the asphalted road, a racetrack of stadium, etc.), has the closed form and is designated by indexes. It is one "circle" at short distances (except competitions where the running segment is carried out at a stadium), on long – a little.

The basic rule of this stage consists that a runner has to move only standing (it is possible to walk, thus some exhausted sportsmen try to finish the last piece of a supermarathon). Run by barefoot and with a naked torso is forbidden.

The end of the running segment (and competitions on a thriathlon) happens in the "finishing gate" which is established on the border of the route and the transit zone.

Winners and triatlets, which are selected by a medical commission, pass the anti-doping control at competitions of the highest level in the end of passing of the combined distance [11].

Punishments. During competitions by the form of the program of thriathlon a sportsman, who allowed violation of the rules, is punished as follows:

- in the transit zone – a delay of a participant for 10 seconds;
- the false start – a delay of a triatlet for 10 seconds;
- in the swimming segment –the swimmer's delay is made for 30 seconds on the termination of a stage;
- at the cycle stage – it is warned by the yellow card then a cyclist needs to stop, to dismount and to wait for a permission of a referee to continue the movement (single violations are punished by a second stop);
- at the running stage – it is warned by a yellow card then a runner needs to stop and to wait for permission of a referee to continue a competition.

Two yellow cards during one stage automatically turn in red, and a sportsman is disqualified. At commission by a participant of competitions of dangerous actions, a referee can be shown at once him the red card with the subsequent disqualification.

At such violations of the rules, as: the lack of a helmet during a cycle race, the main number of a participant (loss), the assistance on distances, the stay in the transit zone out of the schedule of competitions, on the conducted failure or inadequate technical condition of a bicycle, a naked torso - or a running segment – triatelt is disqualified [2; 4; 14].

Continuous triathlon is a rather young sport in our country and it only develops under the direction of FTU now [5]. According to the Provision on "Uniform sports classification of Ukraine" (USCU) there is an assignment of sports categories among men and women in the form of the program of thriathlon (swimming, cycle driving, run) for the present only at three of-

ficially recognized distances (supersprint – 0,3+8,0+2,0 km, sprint – 0,75+20,0+5,0 km, Olympic – 1,5+40,0+10,0 km) on conditions of the implementation of the corresponding classification temporary standards [1; 6; 8].

An assignment of the sports rank "The master of sports of Ukraine" is made at the implementation of relevant requirements, namely to take 1–3 place in the championship of Ukraine in personal offset or 4–6 on condition of the achievement of the result which isn't exceeding more than for 5% of time of a winner [8].

The purpose of the organization of All-Ukrainian competitions in thriathlon is the further promoting of this sport in our country.

The main objectives of carrying out competitions consist in the increase of sports skill and identification of the most trained sportsmen for completing of a national team of Ukraine for the purpose of successful performances on the international scene.

The rank of sporting events by types of the program of thriathlon and distances, terms and a venue of starts are annually specified in the item II "Regulations on All-Ukrainian competitions in thriathlon", which is published on the site of FTU http://triathlon.org.ua [10].

Carrying out competitions is carried out under the direction of the Ministry of family, youth and sport of Ukraine and it is entrusted to the main referee board which is approved by the Presidium of FTU.

Local executive authorities concerning physical culture and sport are responsible for the organization and competitions in their territory.

Organizers provide:

- refereeing;
- safety of triatlets at a distance;
- granting (at a necessity) the first aid to participants during competitions;
- safety of sport stock and equipment of athlets in the transit zone;
- assistance in the organization of accommodation and food of sportsmen and referees;
- information and media support.

Certain athletes, national teams of areas, The AR Crimea, Kiev and Sevastopol are allowed to All-Ukrainian competitions in thriathlon, which confirmed participation of FTU in it in 7 days prior to a concrete sporting event in writing. The structure of these teams is formed of athletes of PSO, CYSS, CYSSOR, SHSS, HSPC in the following age groups which are approved by the Federation of thriathlon of Ukraine according to the rules of ITU and ETU:

- cadets – 13–15 years old;
- young men – 16–17 years old;
- juniors – 18–19 years old;
- youth – 20–23 years old;
- adults – are 24 years old and older.

The day of arrival representatives of teams submit the inundated applications of participants to the credentials committee which are certified by the regional governments on physical culture and sport and the relevant medical institutions.

Each participant has to have at himself the necessary equipment and sport stock which are responsible for the requirements of competitions, and also the traveling certificate, the passport or the birth certificate, the insurance, the certificate of a state of health from the sports -medical center. Children are allowed to registration only accompanied by parents (or persons who replace them) and in the presence of their written permission for participation in competitions.

Competitions in thriathlon are held by the existing rules which are approved by FTU and coordinated with the Ministry of family, youth and sport of Ukraine. Personal and command places are determined by their results. Winners and prize-winners (both in a personal, and in a team competition) are awarded by medals of the corresponding degrees, diplomas and valuable presents. Medals are handed as well to their coaches.

All expenses on a business trip of participants of competitions assume the directing them organizations. The Ministry of family, youth and sport of Ukraine finances payment of referees, rent of a venue of competitions, typographical expenses and prizes.

The organization and competitions, which are passed during 2010 by the form programs of thriathlon in Ukraine, looked as follows:

- The winter personal team championship of Ukraine passed among juniors and adults at distances of 300 m of swimming, 8,0 km of cycle driving and 2,0 km of run on 13-14 of March.

The swimming segment was carried out in the pool, the bicycle segment was carried out by rules of a race for time (drafting was forbidden), and the running segment passed at a stadium.

The personal offset was defined among each age group on the sum of the results (the smallest time) which are shown in three disciplines. The team competition was carried out only among juniors (boys and girls). Thus as a part of each team there were 4 persons, and its final place was determined by the sum of three best results of participants by time.

- The open winter championship of Ukraine was organized among juniors and adults (personal) on 27-29 of March.

Competitions among juniors were held at distances of 800 m of swimming, 20,0 km of cycle driving and 5,0 km of run, and among adults – 1,5/40,0/10,0 km respectively.

The swimming segment passed in the pool, the bicycle segment – on the route (by rules of a group race), running – at stadium.

The personal offset was determined by the sum of the temporary results of performances on three diverse pieces of a distance.
- The personal team championship of Ukraine was carried out among CYSS, CYSSOR and SHSS on 23-26 of April. The format of distances for cadets made 300 m of swimming, 8,0 km of cycle driving and 2,0 km of run, and for boys, juniors

and adults – 0,75/20,0+5,0 km respectively.

The swimming segment was carried out in the pool. The bicycle and running stages – in a continuous sequence (handicap), thus the start was given at them taking into account results of swimming.

An addition of points to participants was made according to the table:

The team competition in a relay (3 persons) was defined in two age groups (till 19 years old and older) at distances of 300 m of swimming, 8,0 km of cycle driving and 2,0 km of run for each participant.

At first a swimming relay was held in the pool (300 m x 3) and the start on cycle racing and run was given by results of lag of a team at the first stage (in a sheaf).

The command result in a relay was made by the sum of results of three participants. An addition of points to team was carried out according to the tab. 1 (for each participant with coefficient 0,5).

The all-team competition was defined by counting of points of eight the highest personal indicators and the best results of teams in a relay among men and women in one of age groups (tab. 1).

- The open personal championship of Ukraine at a sprint distance (0,75+20,0+5,0 km) was held among juniors and adults on 2–4 of May.
- The open Cup of Ukraine and the championship of Ukraine passed on 21-23 of May.

Sportsmen competed at the Olympic distance (1,5+40,0+10,0 km) on the open Cup of Ukraine, thus the personal offset was carried out in absolute superiority (among all age groups).

The championship of Ukraine was held at a supersprint distance (0,3+8,0+2,0 km) among cadets, young men, juniors and adults.

The start was separate with an interval 1 minute, thus the leading was forbidden at the cycle stage.

Personal and command competitions. The personal offset was defined among each age group. The team competition was carried out among women's and men's teams also in all age categories. The result of a team was defined by the sum of temporary indicators of three of its participants.

- The open championship of Ukraine at a long distance (1,9+90,0+21,0 km) was held on 5-6 of June.

The personal offset was defined in absolute superiority.

- The championship of Ukraine passed among young men of younger age (cadets) at a distance of 0,3+8,0+2,0 km and young men of the advanced age (young man) at a distance of 0,75+20,0+5,0 km on 28-30 of June. The personal offset was defined in each age group.

As these competitions are personal and command, the team competition was carried out in relay-mixed (a man – a woman – a man – a woman) in each age group at a distance of 0,3+8,0+2,0 km which was overcome by each participant of a mixed crew. The sum of results of four of its participants was considered as a result of a team (on time).

- The open championship of Ukraine at a distance of 1,5+40,0+10,0 km was held on 22-26 of July. The personal offset was defined in absolute superiority.

Along with these competitions the championship of Ukraine in relay-mixed passed among juniors and adults at a distance of 0,3+8,0+2,0 km (for each participant).

The team competition was carried out in each age group, thus the result of a team was made by the sum of results of four of its participants (on time).

- The team championship of Ukraine passed among juniors and adults at a distance of 0,75+20,0+5,0 km on 20–22 August.

The teams which are consisted of 5 people, started with a time interval of 2 minutes, thus the finish was set off on the third participant for each of them who finished all distance.

The team competition was defined for men and women in each age group.

The International competitions "Cup of Hortitsa" at a distance of 0,75+20,0+5,0 km passed in parallel with holding this sporting event. Thus the personal offset was carried out in absolute superiority.

- The Cup of Ukraine at a distance of 0,75+20,0+5,0 km was held on 11-13 of September. The personal offset was carried out in absolute superiority.
- The cup-final of Ukraine at a distance of 0,75+20,0+5,0 km was carried out on September 25-26. Personal competitions, thus individual competition was defined in absolute superiority.

The analysis of compliance to the rules of ITU and ETU of the competitions held by FTU by the form of the program of thriathlon within UPSPSEU testifies that in a number of the All-Ukrainian starts specifics of this sport, namely consecutive overcoming of the combined distance by means of different types of physical activity against the spent neuromuscular energy of an athlete aren't observed. Competitions, when in the

Place	1	2	3	4	5	6	7	8	9	10	11	12
Points	100	80	70	60	50	40	30	25	20	15	10	5

cold season segments of a distance, various on character,are overcome by athletes with time intervals between them, remind an usual all-round on cyclic sports, than continuous triathlon as personal offset is determined by the sum of temporary results of performances on three diverse pieces of a distance more.

Also the competitions to one time interval which are held in Ukraine after swimming with the subsequent overcoming of bicycle and running stages in a sheaf (handicap) don't correspond to the international rules as there is no the first transit serving for change of sport stock, equipment and a type of physical activity of a triatlet.

However the creative interpretation of competitions separately in the disciplines making it for an objective assessment of efficiency of the training process on the sports entering thriathlon is possible for the successful solution of problems of a certain stage of preparation of a triatlet.

One more distinctive feature is that the first stage, after the general start, is carried out by group movement of athletes on open water (the sea, a reservoir, the rowing channel, etc.) by rules of the international federations of a thriathlon in the conditions of close contact with other swimmers that doesn't correspond to conditions of the implementation of classification temporary standards at the competitions III-IV of ranks held in our country by results of which there is an assignment of sports categories in a sport thriathlon as the swimming segment on request of ESKU is carried out only in the pool [4; 8; 14].

All these discrepancies to the international rules od ITU and ETU influence sports results which show domestic triatlets at the international competitions in thriathlon. So, the time of overcoming of a distance demanded for an assignment of sports categories in the form of the program of thriathlon in our country significantly differs from similar standards of other countries. In Ukraine an assignment of the I sports category is carried out when overcoming by athletes of the Olympic distance (1,5+40,0+10,0 km) for 2:13:0 at men and 2:36:0 at women, and in Russia – for 2:25:0 and 2:45:0 respectively. In this example the temporary discrepancy is observed at assignment of sports categories at all distances of a type of the program of thriathlon [8].

In an ideal, it should to adjust not rules and standards to the existing competitions conditions, but FTU to promote the creation of the infrastructure conforming to requirements of this sport for carrying out competitions in Ukraine in the cold season (for example, the sports complex uniting in itself the 50-meter swimming pool, bicycle track and track and field athletics arena). Thus it is expedient to remove cables with floats (the dividing paths) for carrying out the first stage in the pool, having replaced them with anchor buoys on corners, and the competing triatlets to carry out group swimming in water on perimeter.

Conclusions

It is possible to draw the following conclusions on the basis of the conducted research:

1. The rules ITU and ETU lay at the heart of the organization and continuous triathlon competitions in Ukraine.

2. The competitions which are held by FTU by the form of the program of thriathlon in the cold season with time intervals between types of physical activity when overcoming of the combined distance, don't correspond to the rules of the international federations.

3. The lack of conditions in Ukraine for carrying out in the cold season of competitions by the form of thriathlon leads programs to violation of specifics of continuous triathlon, namely the consecutive overcoming by an athlete of all combined distance against the neuromuscular energy spent by it that causes need of the creation of the corresponding infrastructure.

Prospects of further researches

The subsequent researches will be directed on the determination of compliance to the international rules of the competitions which are held by FTU by the form of the program of duathlon.

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Analysis of competitive shooting of the world top female biathletes and female biathletes of the national team of Ukraine

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Purpose: *optimization of preparation of highly skilled female biathletes on the basis of determining the required number of shots that provides optimum prerequisites for stable performance at the season major competition.*

Material & Methods: *analysis of scientific-methodical literature; theoretical methods of scientific cognition; methods of mathematical statistics.*

Results: *average percentage of hits of the World and Olympic champions and prizewinners (2006–2015) has been calculated. It constitutes 84,47% during 420 shots performed per season. It has been revealed that in 86,42% of cases the high quality of shooting is provided by 340ч500 shots performed per season.*

Conclusions: *in order to medal at the season major competition one should have the level of shooting preparation equal to 84ч85% hits per season, minimum possible quality of shooting along with excellent racing preparation – 79,5%. 160–280 competitive shots performed per season could provide stable performance at the major competition.*

Keywords: *biathlon, number of shots, competitive shooting.*

Introduction

A wide use of competitive practice, not only in the form of shows, but also as an effective remedy of training of sportsmen is a distinctive feature of modern sport [9; 17; 18]. It led to the increase in the international competitive program, the creation of the international competitive structure with the rigid quota system and admissions which isn't allowing to come for starts of large international competitions to poorly trained sportsmen in biathlon [13; 23] that in total «was reflected in the increase of influence of the system of competitions at strategy of training of biathlonists» [5].

According to a number of experts [13; 15; 20], the World Cup (WC) in biathlon is one of the rigid international competitive calendars which creation of trimesters doesn't consider the number of the days which are necessary for adaptation of an organism to geographical factors of venues of competitions. The accepted system of calculation of general and national offsets [23] in biathlon forces sportsmen to participate in all stages of WC and to start constantly in an emergency and wasteful phase of adaptation of an organism to mountain or hour conditions that considerably emasculates their organism and leads to the decrease in the level of sportswear [5; 15].

Competitions are used as an effective remedy of training of the separate parties of preparedness which aren't often solved by means of usual trainings in the modern system of training of sportsmen. At the same time experts recommend to use competitions only in that volume which will provide optimum preparedness of sportsmen for the main start of a season as an insufficient competitive practice leads to decrease in efficiency of the competitive activity [9; 10; 17; 18; 20]. In total these two factors (the optimum competitive practice and the international competitive calendar which isn't providing an effective management of a condition of a sportswear) put forward the expediency of creation of individual competitive calendars at admission to the main start of a season (MSS) [16; 19].

As biathlon combines two sports: ability to move quickly on skis on a distance and hold high-quality and fast shooting, and a contribution of the last indicator to sports result increased significantly for the last decades [6–8; 12] – it is possible to ask a question – if the level of sports skill of biathlonists directly depends on quality of shooting, [2; 7; 8] what kind of parameters of competitive shooting preparation need to achieve to come to the level, allowing to fight for a gain of medals on MSS and what number of competitive starts provides stability of this indicator.

Recommendations weren't revealed by the authors in scientific and methodical literature on biathlon concerning the optimum competitive practice providing an effective performance in the main start of a season [3; 4; 7; 8; 11; 14; 21; 22]. This work is a continuation lifted by authors before a subject on optimization of training of highly skilled biathlonists taking into account the international system of competitions [5; 7; 13; 15; 16].

Communication of the research with scientific programs, plans, subjects

The area of the work corresponds to a scientific subject 2.5.

«The improvement of the training process in winter sports» on the specialty 24.00.01. – Olympic and professional sport of the Consolidating plan of the research works in the sphere of physical culture and sport for 2011-2015.

The purpose of the research

To optimize training of biathlonists of high qualification on the basis of definition of necessary quantity of the competitive shots providing optimum prerequisites for a stable performance in MSS.

Research problems:

1. To carry out the analysis of scientific and methodical literature regarding influence of quality of shooting on result in biathlon and optimum competitive practice on result of performance in the main start of a season.

2. To determine the level of shooting preparedness of the leading biathlonists of the world ascending to the podium at the winter Olympic Games (WOG) and the World Cups (WC) in individual types of the competitive program.

3. To define the optimum quantity and quality of the competitive shots providing a possibility of a gain of medals in MSS (WC, WOG).

4. To define the quality of competitive shooting training of sportswomen of a national team of Ukraine for the purpose of further recommendations about the creation of individual competitive calendars.

Material & Methods

The following methods of the research were used in the work:

1. Analysis of scientific and methodical literature.

2. Theoretical methods of scientific knowledge, such as supervision, generalization, analysis and synthesis.

3. Methods of mathematical statistics.

More than 3300 protocols of competitions of stages of WC among women, WC and WOG from 2005/2006 till 2014/2015 sports seasons were undergone to the analysis.

Results and discussion

It is the most convenient to estimate professional shooting skill of biathlonists by means of an integrated indicator – the «percent of hits» characterizing reliability of his shooting both at concrete competitions, and during the season in general [2; 7]. In use the quantity of shots which were made by a sportsman at competitions, are called «a competitive shot». Sportswomen-biathlonists who are ascending to the podium at WC and WOG from 2006 till 2015 in individual disciplines of the competitive program on average for a sports season, have a «competitive shot» 420 shots at 84,47% of hits (tab. 1).

In total the competitive activity of 82 sportswomen was investigated. The number of sportswomen doesn't coincide with quantity of the held medals as one sportswoman could win several medals in a season. The quality of shooting of 79,27% of the leading sportswomen is in the range from 80,1 till 90,0% of hits (pic. 1). Only 6,1% of shoot better than 90,0%. A low interest of hits is a criterion which cuts sportsmen from a fight for medals. It is seldom who shoots worse than 80,0% at the quantity of shots in competitions for 400. It is possible to compensate a low interest of hits only by high speed of movement (Lilia Efremova, Uschi Disl, Magdalena Neuner). Just these sportswomen, who are performing several years, enter the remained 14,63% of the prize-winners who are having the worse quality of shooting 80,0% (pic. 1).

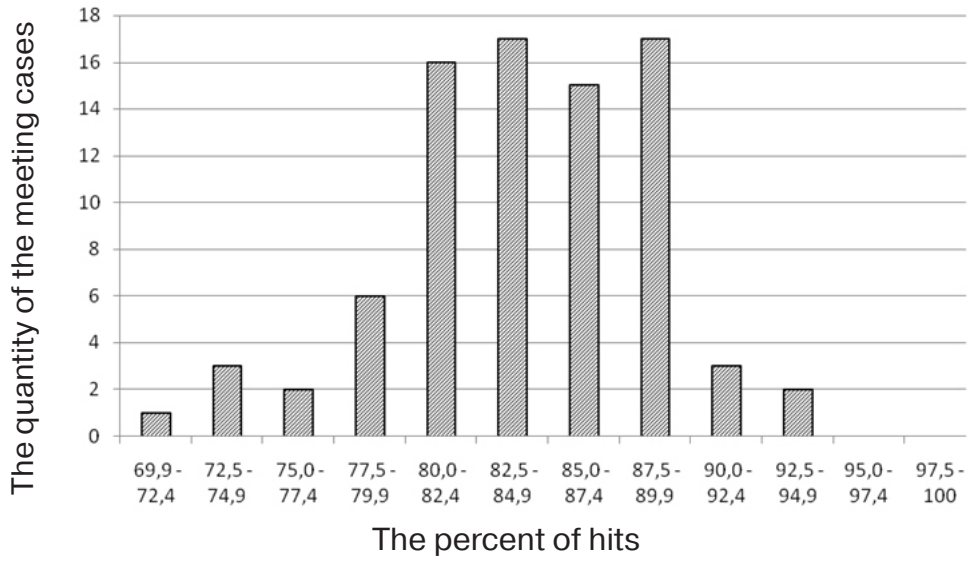
Distinctions as firing at sportswomen before MSS (at various quantity of stages of WC before MSS) and during the season in general are statistically doubtful and aren't defined by the number of starts (tab. 1). The coefficient of correlation of this indicator makes 0,927 that speak about high interrelation of these indicators. A distinctive feature of this selection is improvement of quality of shooting on MSS. So, before MSS the percent of hits on group averaged 84,07%±4,94 (84,16% at 6 stages of WC and 83,85% at 8 stages of WC) (tab. 1). On MSS – 86,27%±5,75, what is better on 2,20%. And on the start which has brought to sportswomen of medals – 93,45%±5,56 that is on 9,38% better, than before MSS. And distinctions as shooting are reliable (compare pic. 1 and 2).

On the start which has brought medals, 98,78% of sportswomen have the quality of shooting higher than 80,0% of hits, 93,9% shoot better than 85,0% of hits, 85,37% of sportswomen have the percent of hits higher than 90,0 (pic. 2). The biathlonists having the highest ski-racing preparedness

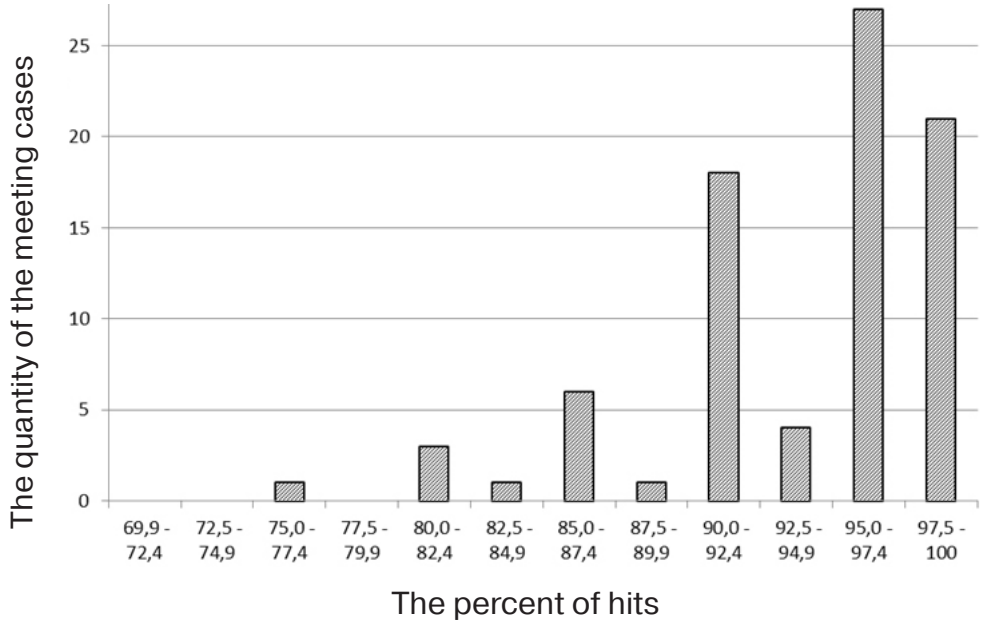
Table 1

Statistical data of a competitive shooting of biathlonists who won prizes at WC and WOG from 2006 till 2015 (n=82)

№	Indicator	Total of a season		Before the main start of a season				On MSS (WC, WOG)		On the start of MSS, winning of a medal	
				At 6 stages of WC till MSS		At 6 stages of WC till MSS					
		% hits	Shots	% hits	Shots	% hits	Shots	% hits	Shots	% hits	Shots
1	Average	84,47	420,26	84,16	214,96	83,85	306,84	86,27	82,74	93,45	
2	σ	4,50	62,99	5,12	39,61	4,58	49,58	5,75	11,39	5,56	
3	Maximum	94,2	508	94,4	272	94,1	355	95,1	110	100,0	70
4	Minimum	71,8	240	70,7	106	71,1	165	74,0	51	76,6	10
5	Cases (n)	82		57		25		82		82	



Pic. 1. The chart of distribution of the quality of shooting during the season at champions and prize-winners of WC and WOG from 2006 till 2015 among women (n=82)



Pic. 2. The chart of distribution of the quality of shooting on the start which has brought medals at champions and prize-winners of WC and WOG from 2006 till 2015 among women (n=82)

(14,63%) have the percent of hits lower than 80,0 % during the season, they mobilize and shoot better80,0% on MSS. At the distance which has brought them medals, the quality of their shooting averages 90,83% (tab. 2).

Thus, the level of sports skill directly depends on the quality of shooting, and the quality of shooting directly depends on the quantity of the made shots at competitions that in turn depends on the number of starts in which a sportsman took part [1; 6].

Such quality of shooting 340x500 with competitive shots for a sports season – 86,42% of cases is provided (pic. 3). Less than 340 and more than 500 competitive shots are done only by certain biathlonists. It is necessary from 160 till 280 competitive shots before MSS at 6 stages of WC before MSS. The executed less than 160 shots by certain sportswomen can be counted up before MSS, most likely, the exception connected with the postponed illness in a season, but not regularity or the tactical decision. Sportswomen manage to make bigger quantity of competitive shots (from 260 to 360) at 8 stages of WC before MSS.

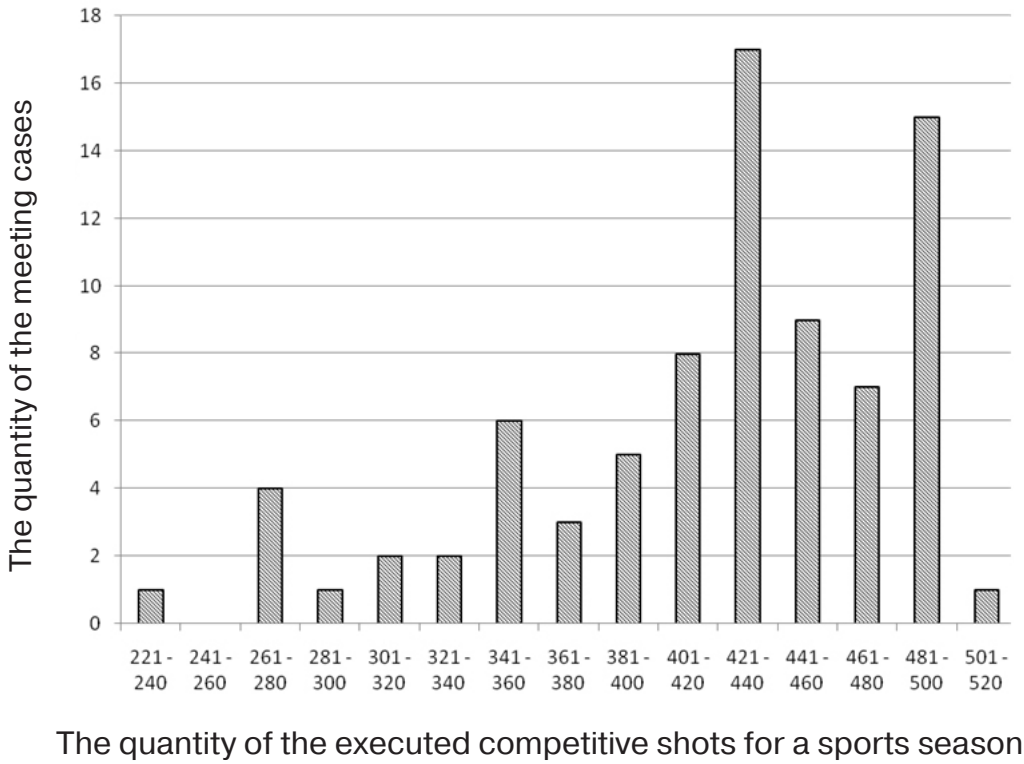
The quality of competitive shooting of leaders of a national team of Ukraine (tab. 3) is above the shown average indicators of prize-winners of WC and WOG in a season what allows them to ascend to the podium of these competitions periodically.

The long-term analysis of THE competitive activity of sportswomen of a national team of Ukraine (tab. 3) allows making several conclusions. High-quality shooting is possible at small

Table 2

Statistical data of the competitive shooting of the biathlonists who took prizes at the WC and WOG from 2006 till 2015, who are having the worse quality of shooting in a season 80,0% (n=8)

№	Surname, Name	Year	% of hits			
			At a season	Before MSS	On MSS	On a distance, having taken medals
1	Disl Uschi	2006	75,1	79,1	78,6	85,0
2	Efremova Lilia	2006	71,8	71,9	75,6	100,0
3	Neuner Magdalena	2007	74,6	70,7	74,6	80,0
4	Neuner Magdalena	2008	73,5	74,3	74,0	80,0
5	Hauswald Simone	2009	79,5	76,0	74,6	100,0
6	Kuzmina Anastasiya	2009	76,5	73,6	80,0	90,0
7	Domracheva Darya	2011	79,9	80,9	76,1	85,0
8	Bachmann Tina	2011	72,5	71,1	79,6	90,0
9	Kuzmina Anastasiya	2011	79,7	80,6	78,9	90,0
10	Neuner Magdalena	2012	79,5	81,8	74,7	90,0
11	Kuzmina Anastasiya	2014	79,7	79,0	84,0	100,0
12	Gasparin Selina	2014	79,9	80,9	88,5	100,0
	Average		76,85	76,66	78,28	90,83
	σ		3,19	4,20	4,41	7,64
	Maximum		79,9	81,8	88,5	100,0
	Minimum		71,8	70,7	74,0	80,0



Pic. 3. The chart of distribution of the quantity of the competitive shots executed for a sports season at champions and prize-winners of WC and WOG from 2006 till 2015 among women (n=82)

Table 3

Dynamics of the quality of competitive shooting (% of hits) and the quantity of competitive shots in the competitive period at the sportswomen of a national team of Ukraine who were taking part in WC or WOG

№	S.N.	Indicator	Sports seasons								
			2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
1.	Pidgrushna Ye.	% of hits	78,9	81,2	84,7	86,3	86,3	81,9	88,3	89,5	
		Shots	361	202	313	437	400	343	478	256	
2.	Semerenko V.	% of hits	78,0	84,0	84,2	85,2	84,6	84,0	86,9	88,4	
		Shots	459	356	481	472	469	450	459	294	
3.	Semerenko V.	% of hits	84,5	82,8	77,0	85,3	81,6	76,9	79,9	84,7	86,4
		Shots	343	377	473	422	463	411	427	438	566
4.	Khvostenko O.	% of hits	91,1	87,1	90,9	91,1	87,6				
		Shots	448	395	330	338	201				
5.	Dzhima Yu.	% of hits		79,5	77,6	82,0	83,5	83,1	85,2	85,3	86,7
		Shots		210	232	161	315	225	371	374	414
6.	Burdyga N.	% of hits					88,3	81,5	77,8	82,2	79,6
		Shots					180	428	221	314	314
7.	Suprun I.	% of hits	73,3	75,8	71,9	78,0	81,4	71,9	79,7	74,4	
		Shots	150	289	231	91	291	221	227	203	
8.	Abramova O.	% of hits								69,0	73,3
		Shots								216	371
9.	Bondar Ya.	% of hits							74,7	68,4	69,0
		Shots							225	187	252
10	Panfilova M.	% of hits							72,6	69,0	
		Shots							135	252	
11	Varvinets I.	% of hits							82,3	77,3	83,7
		Shots							124	229	326
12	Zhuravok Yu.	% of hits								84,9	94,6
		Shots								146	260

«shot» as there is a high probability to make it in optimum conditions (a calm, an approach to a boundary at speed, a lack of a strong emotional background), but it doesn't possess a competitive reliability [2; 7]. The continuous practice is necessary for high-quality conducting shooting at the most responsible competitions that is expressed in participation in a large number of starts and it is reflected in competitive «shot». So, the average percent of hits top-10 WC at women made 85,6% at 416 shots in 2009/2010 sports season [7]. Falling of the quality of shooting at poorly trained sportsmen with increase in the quantity of shots is natural as the various unforeseen and not met earlier situations begin to meet (shooting ranges with a different wind rose, unusual lighting, inconvenient approach, big desire to make firing good, a high emotional background of a fight, etc.), with which a sportsman doesn't cope, and it is negatively reflected in result of his firing. However the general fitness increases that is reflected in stabilization and improvement of the quality of shooting as time goes by with the increase in the quantity of shots.

The decrease in number of starts before the main start of four years till 9-12, with the purpose to come «fresher» to the most necessary distances, can be considered expedient. Such actions lead to decrease in a competitive shot and improvement of quality of shooting, but then the basic work has to precede it for about five and more years (tab. 3). From the table it is visible that the decrease in the quantity of competitive loading (as the indicator – quantity of the made shots at competitions) promoted at several sportswomen in a season of 2014 to shooting improvement of quality. The decrease of «shot» was preceded by a long basic work for several years. The decrease in competitive loading without a good basic work doesn't bring a result (tab. 4).

Table 4

The characteristic of competitive shooting of Yelena Petrova (all official competitions are considered)

Sports seasons	% of hits			Total	
	Total	Lie	Stay	Shots	Miss
2000/01	85,6	86,4	84,8	354	51
2001/02	86,3	83,3	89,4	174	24
2002/03	84,1	88,2	80,0	220	35
2003/04	82,5	86,9	78,0	120	21
2004/05	86,4	90,0	82,9	140	19
2005/06	81,1	90,3	71,5	264	50

The decrease in competitive shooting practice for the highly experienced sportswoman Yelena Petrova before the World Cup 2004 have led to good result (bronze in an individual race) (tab. 4). However four sports seasons without a break, especially two the last, the previous WOG-2006 (on 120 and 140 shots for a sports season), – have led to loss of self-confidence, deterioration in rate of fire and quality of firing at competitions of MSS. The quantity of shots in competitions at Yelena Petrova in two Pre-Olympic seasons are 3,5 times less, than at leaders of the world biathlon. Our researches show that decrease in the level of competitive practice is justified for one season, and that by good long-term basic shooting preparation. The decrease in competitive practice leads more than two years to deterioration of competitive shooting and,

as a result, is negatively reflected in sports result.

The decrease at some sportswomen of competitive «shot» in a season, as well as the number of starts, can be connected both with the tactical decision, and with temporary circumstances (illness, disqualification, missing in the main structure of the national team, desire to finish an unfortunate sports season or sports career in the middle of a season). Therefore the main criterion at an individual competitive calendar is density of competitive starts before MSS, but not during the season in general.

Conclusions

1. The number of the starts falling on each sportsman in a season (that influences the level of a competitive shot) has to be optimum and accurately dosed for the achievement of the best sports result on the most responsible starts of a season or four years.

2. It is necessary to have the level of shooting preparedness not lower than 80,0% of hits during the season (85,37% of all prize-winners) to apply for a gain of medals on MSS. The average percent of hit of champions and prize-winners of WC and WOG for the last 10 sports seasons from 2006 till 2015 makes 84,47% at 420 shots.

3. 93,9% of sportswomen in MSS won medals with the quality of shooting in the range of 85,0-100% in individual disciplines from 2006 till 2015 seasons. And 85,37% with the quality of shooting in the range of 90,0-100%.

4. A low interest of hits is a criterion which cuts sportsmen from fight for medals. On a share of the sportswomen who are shooting worse in a season 80,0%, 14,63% of medals are necessary, therefore it is necessary to achieve the quality of shooting higher than 90,83% of hits for a gain of medals.

5. High quality of shooting is provided with 340-500 competitive shots for a sports season at hits – 86,42% of cases. At the same time a stable performance on MSS requires from 160 till 280 competitive shots executed before MSS. Distinctions as shooting at sportswomen before MSS and during the season in general are statistically not reliable and aren't defined by the number of starts.

6. The decrease in number of starts before the main start of four years till 9-12 can be considered expedient at long-term basic sports preparation, with the purpose to come «fresher» to the most necessary distances. Such actions though lead to the decrease in a competitive shot, but, as a rule, increase the quality of shooting.

7. The main criterion for drawing up an individual competitive calendar is a performance of a necessary competitive shot before MSS, but not during the season in general.

Prospects of further researches

Provide a creation of optimum individual competitive calendars taking into account the necessary quantity of competitive shots before MSS.

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