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

Contents Themes:

1. Physical education of different population groups.
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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SLOBOZANS`KIJ NAUKOVO-SPORTIVNIJ VISNIK *№ 5(49), 2015*

CONTENT

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Features of selection of children for occupations by artistic gymnastics in modern Kurdistan

Abstract. ***Purpose:*** *to study the organizational and pedagogical conditions of selection of children for occupations existing in the republic Kurdistan artistic gymnastics.* ***Material and methods:*** *questioning of 24 trainers on artistic gymnastics and experts in physical culture of the republic Kurdistan was carried out. The general questions of selection and methodical features of selection of children for occupations by artistic gymnastics in Kurdistan were studied****. Results:*** *questioning revealed absence of the general approved tests and scientific recommendations concerning their use, dependence of quality of selection on experience of the trainer****. Conclusions****: experts in the field of physical culture and sport consider inefficient the existing system of selection of children for occupations artistic gymnastics in Kurdistan; gymnastics coaches consider necessary testing's at children of a level of development of flexibility, dexterity, abilities to manifestation of dynamic force and preservation of dynamic balance.*
Keywords: *artistic gymnastics, sports selection, physical qualities, abilities.*

Statement to a problem. In the social transformations happening in the autonomous Kurdish republic which is a part of Iraq, the special place is allocated for the solution of welfare tasks, cultural and educational policy of a humanistic orientation, education of the younger generation making more than a half of all population of the republic. In this process the physical culture is considered as the most important means of strengthening of health of children and youth, development in them of moral and strong-willed qualities, education of their public activity, the responsible relation to study and work [2, 12]. In this regard the gymnastics role, as historically developed set of specific means and methods of harmonious physical training of children and youth increases [6, 7]. System of artistic gymnastics in the republic Kurdistan are now in a formation phase that will actualize need of studying of a problem of selection of children and teenagers to occupations by this sport.

Analysis of the last researches and publications. Leading experts in area of physical culture and sport [4, 10] consider that selection for occupations of children this or that sport represents the system of organized and methodical actions of complex character including pedagogical, sociological, psychological and medico biological methods of research on the basis of which use inclinations and abilities of children and teenagers for sports activities come to light. In artistic gymnastics at a stage of initial selection by means of complex supervision and control tests abilities of children to occupations are defined by this sport. Leading experts on artistic gymnastics [3, 5, 8] consider that in the course of training of gymnasts it is necessary to define a state of health engaged, to consider dynamics of indicators of their physical development, ability to training of equipment of the chosen sport.

Communication of work with scientific subjects. Research is carried out within the complex scientific project "The Teoretiko -metodologichesky Principles of Formation of Personal Physical Culture at Children and Youth as Bases of Their Health" (number of the state registration: 0113U001205).

Research objective. To study the organizational and pedagogical conditions of selection of children for occupations existing in the republic Kurdistan artistic gymnastics.0113U001205).

Research problems.

1. To study the general questions of selection of children for occupations by artistic gymnastics in the republic Kurdistan.
2. To study methodical features of selection of children for occupations by artistic gymnastics in the republic Kurdistan.

Material and methods of research. 24 leading experts in area of physical culture and sport of the republic Kurdistan took part in research. Questioning was carried out with gymnastics coaches, teachers of physical culture at high schools, with gymnastics teachers at three universities (. Which, Mr. Erbile, Mr. Sulimaniya). Besides the secretary of federation of gymnastics of Kurdistan, the judge of the Iraqi union of gymnastics took part in questioning the head of the Union on gymnastics of Mr. Erbil. Directors of managements of physical culture and sport of also took part in our research. Which and Mr. Erbil, director of the center of youth sport and children of. Which, responsible in the Ministry of Education of the republic Kurdistan for the organization of sports competitions at schools, three doctors of science, and also young teachers and the teacher of physical culture in academies and schools.

Questions of the questionnaire affected the general condition of system of selection of children for occupations by artistic gymnastics in Kurdistan, opened methodical bases of implementation of process of selection in artistic gymnastics, allowed to point out the existing defects of control of training of gymnasts [1, 7, 13].

For an assessment of reliability of a percentage difference of answers of respondents the method was used researches of the importance of a difference of parts [9]. Counted z coefficient on a formula:

$$z = \frac{|v_1 - v_2|}{s},$$

v_1, v_2 – percentage results of two selections,

$$s = \sqrt{v(1-v)\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}, \quad v = \frac{v_1 n_1 + v_2 n_2}{n_1 + n_2}.$$

Critical values *z*: for p=0,05 $z_{кр}$=1,96; for p=0,01 $z_{кр}$=2,58. Coherence of experts decided on the help of coefficient of a conformation of Kendal (***w***) which was calculated by drawing up tables of ranks. Statistical data processing was carried out on the personal computer with use of a spreadsheet of "EXCEL" and universal statistical STATISTICA package.

Content of the main material. For the analysis of the received results of questioning answers of respondents are submitted as a percentage. The percentage ratio for experts in gymnastics and for the respondents who don't have specialized experience on gymnastics was calculated and also the percentage ratio for all questionnaires was calculated. Results of researches are presented in table 1, in the table the results indicating lack of a reliable difference between opinions of trainers on gymnastics and experts in physical culture (tab. 1) are highlighted in bold type.

Table 1

Results

№	Questionnaire questions	Results (%)			Reliability assessment	
		gymnastics coaches (n=14)	experts on F.K (n=10)	all respondents (n=24))	Z	P
1	**Whether the system of selection existing now in Kurdistan in artistic gymnastics is effective?**					
a	yes	7,1	0	4,2	10,7	P<0,01
b	no	**92,9**	**100**	**95,8**	**0,4**	**P>0,05**
2	**Specify shortcomings of the existing system of selection:**					
a	absence of the general approved tests and scientific recommendations concerning their use	**100**	**90**	**95,8**	**0,57**	**P>0,05**
b	dependence of quality of selection generally from experience, an initiative, responsibility of the trainer who makes selection	**50**	**60**	**54,2**	**1,01**	**P>0,05**
c	low informational content of the used tests	28,6	70	45,8	4,95	P<0,01
d	uses of outdated tests	28,6	50	37,5	3,14	P<0,01
e	Lack of system of selection as that	35,7	70	50	3,76	P<0,01
f	Your option	21,4	10	16,7	3,83	P<0,01
g	**At selection of children for occupations by artistic gymnastics on what first of all you turn attention:**					
h	state of health	28,6	50	45,8	3,14	P<0,01
i	physical development and features of a constitution	78,6	35,7	66,7	3,86	P<0,01
j	on the level of their physical fitness	**57,1**	**50**	**62,5**	**0,72**	**P>0,05**
k	psychophysiological features	42,9	28,6	41,7	2,13	P<0,05
l	personal behavioural features	**50**	**50**	**58,3**	**0,0**	**P>0,05**

As a result of questioning came to light that the vast majority of respondents consider inefficient the existing system of selection of children for occupations to artistic gymnastics in Kurdistan (95,8%). Essential shortcomings of system of selection, according to respondents, it is considered: absence of the general approved tests and scientific recommendations concerning their use (95,8%), dependence of quality of selection generally from experience, an initiative, responsibility of the trainer who makes selection (54,2%). They also noted that at selection of children for occupations by artistic gymnastics first of all it is necessary to pay attention to the level of physical fitness (62,5%) and to personal behavioural features engaged (50%).

However, on some questions the opinion of experts was significantly shared. Gymnastics coaches consider that the system of selection after all exists as they participate in this process, make a maximum of efforts, use informative tests (35,7% and 70%; P <0,01). At selection of children for gymnastic activity of 50% of experts in physical culture consider, an essential factor a state of health of children (P <0,01), 78,6% of trainers on gymnastics first of all consider physical development and features of a constitution of athletes (P <0,01). It is also necessary to note that four respondents pointed to lack of system of preparation of trainer's shots on artistic gymnastics in Kurdistan (16,7%).

<!--0-->The importance of physical qualities in system of selection of athletes for occupations by artistic gymnastics

was estimated by respondents on five-point system [7, 13]. For the analysis of results average values of the importance of each physical quality, coefficient of a variation and an average rank (tab. 2) were calculated.

Table 2

The importance of physical qualities of athletes at selection in artistic gymnastics

Physical qualities and motive abilities	Gymnastics coaches n-14			Experts in physical culture n-10			All experts n-24		
	So-so value ($\bar{X}$)	variation factor (%)	Average rank (r)	So-so value ($\bar{X}$)	variation factor (%)	Average rank (r)	So-so value ($\bar{X}$)	variation factor (%)	So-so value (r)
1. Flexibility	4,5	16,9	9,5	4,5	15,7	10	4,5	16,1	9,71
2. Dynamic force	4,46	9,2	9,39	4,7	14,4	10,55	4,58	11,4	9,92
3. Reaction speed	4	25,9	7,93	3,5	37,4	5,9	3,54	29,8	7,08
4. Maximum force	3,93	35,2	7,64	3,7	33,4	6,85	3,69	34	7,31
5. Dexterity	3,82	23,4	7,5	3,9	28,2	8,25	3,85	25	7,79
6. Dynamic balance	3,82	25,5	7,43	4,1	22,6	7,65	3,79	23,7	7,52
7. Softness and plasticity	3,61	23,4	6,79	3,8	31,1	6,45	3,4	25,7	6,65
8. Endurance	3,39	28,9	6,11	3,5	37,4	5,7	3,19	31,4	5,94
9. Spring ability	3,25	41,9	6,11	3,3	21,2	5,8	3,17	34,7	5,98
10. Static balance	3,25	40,2	5,93	3,6	35,6	5,45	3	37,7	5,73
11. Speed	3,21	42,6	6,04	3,3	36,7	6,15	3,15	39,5	6,08
12. Static force	2,64	40,2	4,54	2,7	31,9	5,85	2,67	39,4	5,06

Was defined that gymnastics coaches consider the most significant physical qualities and abilities at selection of children flexibility of 16,9%.($\bar{X}$ - 4,5point) and dynamic force ($\bar{X}$ - 4,46 point). Experts in physical culture estimated importance of flexibility also at 4,5 points, but they estimated the importance of dynamic force slightly above, at 4,7 points. Opinion of all experts in the importance of these physical qualities in artistic gymnastics are coordinated, variation coefficient from 9,2% to 16,9%.

Most of trainers on gymnastics the motive abilities following on importanceallocated reaction speed point; % V-25,9). At selection of children for gymnastic activity trainers ambiguously treated importance of the maximum force.

Gymnastics coaches estimated the importance of dexterity and ability to keep dynamic balance at 3,82 points, however more coordinated opinions of trainers were on the importance of dexterity (% V-23,4 against 25,5%). Softness and plasticity, according to most of trainers, are also necessary for successful occupations($\bar{X}$- 4 allocated reaction speed

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61 points; % V-23,4). Experts in gymnastics defined identical average ranks for endurance and a spring ability (r-6,11). Estimates by trainers of importance for gymnastic activity of a spring ability, static balance, speed and static force are non-uniform variation coefficients from 40,2% to 41,9%. Experts in physical culture slightly above trainers estimated dynamic force ($\bar{X}$ - 3,gymnastics61 points; % V-23,4). Experts in gymnastics defined identical average ranks for endurance and a spring ability (r-6,11). Estimates by trainers of importance for gymnastic activity of a spring ability, static balance, speed and static force are non-uniform variation coefficients from 40,2% to 41,9%. Experts in physical culture slightly above trainers estimated dynamic force ($\bar{X}$ - 4,7 point), dexterity 9 points) and static force pointHigh coefficients of a variation on the majority of the received average results of an assessment of physical qualities caused the necessity to carry out the analysis of coherence of expert estimates on the matter. By means of a universal statistical STATISTICA package coefficients Kendall's konkordation for coaches on the gymnast (W-0,162), for experts in physical culture (W-0,214) and the general for all experts were calculated (0,167). Points the received coefficients to the low level of coherence of experts in determination of the importance of 12 physical qualities and abilities at selection of children in artistic gymnastics. Thus, experts showed coherence only in an assessment of the importance of flexibility and dynamic force, including them "leaders" (an average rank from 9,39 to 10; % V≤16,9) at selection of children for occupations by artistic gymnastics. Experts determined by important quality for gymnastic activity dexterity (r-7,79) and ability to preservation of dynamic balance (r-7,52) (fig. 1).($\bar{X}$- 3,point), dexterity 9 points) and static force pointHigh coefficients of a variation on the majority of the received average results of an assessment of physical qualities caused the necessity to carry out the analysis of coherence of expert estimates on the matter. By means of a universal statistical STATISTICA package coefficients Kendall's konkordation for coaches on the gymnast (W-0,162), for experts in physical culture (W-0,214) and the general for all experts were calculated

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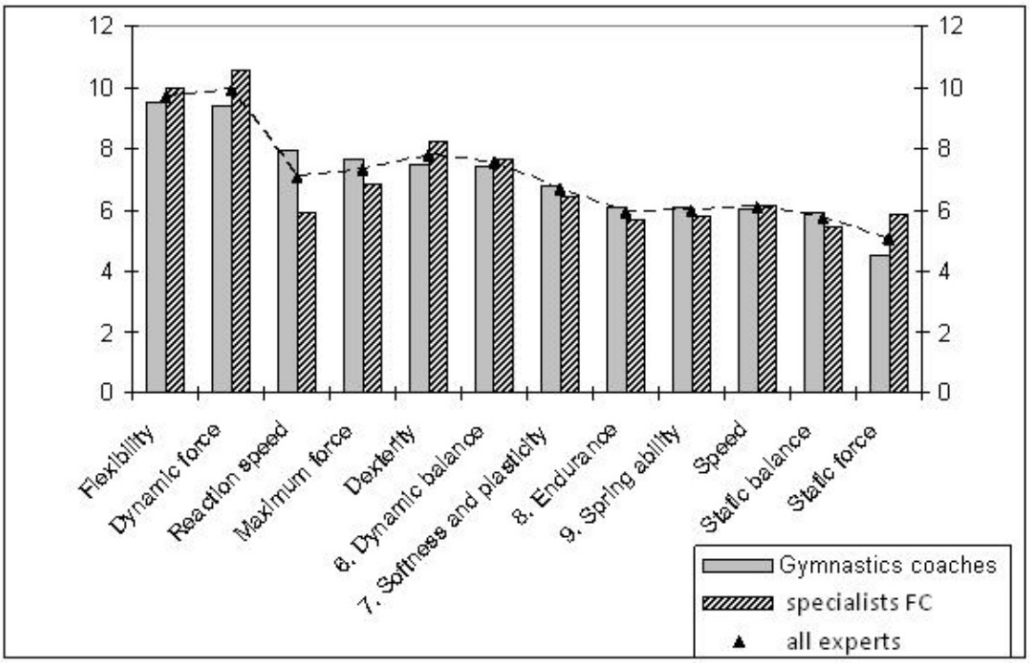

Fig. 1. Average ranks of expert estimates of the importance of physical qualities and abilities for occupations by artistic gymnastics

Artistic gymnastics experts determined by the following physical qualities and abilities, significant on a rank, for occupations the maximum force (an average rank from 6,85 to 7,64), reaction speed (an average rank from 5,9 to 7,93), softness and plasticity (an average rank from 6,45 to 6,65). Important quality noted speed (average ranks ≥ 6,04). A spring ability and endurance gymnastics coaches defined a high rank (r-6,11). Experts in physical culture don't consider important for gymnasts a spring ability and endurance. Were noted by all experts insignificant for selection of children in artistic gymnastics of high level of manifestation of static balance and static force (r≤5,93).

Conclusions.

1. Results of research showed that experts in the field of physical culture and sport consider inefficient the existing system of selection of children for occupations artistic gymnastics in Kurdistan (95,8%). Essential shortcomings of system of selection is absence of the general approved tests and scientific recommendations concerning their use (95,8%).

2. At selection of children for occupations by artistic gymnastics first of all it is necessary to pay attention to the level of their physical fitness (62,5%). Gymnastics coaches in the practical activities consider predictive models of features of a constitution of athletes (78,6%).

3. The most significant physical qualities at selection of children for occupations of the sports Gymnastic sxperts consider the dynamic force and flexibility point andpoint pointsrespectively). Gymnastics coaches in achievement of reliability of selection in this sport consider necessary testings at children of a level of development of flexibility, dexterity,

abilities to manifestation of dynamic force and preservation of dynamic balance. Prospects of further researches the low level of coherence of trainers on republic Kurdistan gymnastics in an assessment of the importance of physical qualities at selection of children for occupations by artistic gymnastics assume enrichment of system of selection by experience of those countries in which such work has deep traditions.($\bar{X}$-4,58experts consider the dynamic force andflexibility point andpoint pointsrespectively). Gymnastics coaches in achievement of reliability of selection in this sport consider necessary testings at children of a level of development of flexibility, dexterity, abilities to manifestation of dynamic force and preservation of dynamic balance. Prospects of further researches the low level of coherence of trainers on republic Kurdistan gymnastics in an assessment of the importance of physical qualities at selection of children for occupations by artistic gymnastics assume enrichment of system of selection by experience of those countries in which such work has deep traditions. $\bar{X}$-4,5experts consider the dynamic force and flexibility point andpoint pointsrespectively). Gymnastics coaches in achievement of reliability of selection in this sport consider necessary testings at children of a level of development of flexibility, dexterity, abilities to manifestation of dynamic force and preservation of dynamic balance. Prospects of further researches the low level of coherence of trainers on republic Kurdistan gymnastics in an assessment of the importance of physical qualities at selection of children for occupations by artistic gymnastics assume enrichment of system of selection by experience of those countries in which such work has deep traditions.(max-5 experts consider the dynamic force and flexibility point andpoint pointsrespectively). Gymnastics coaches in achievement of reliability of selection in this sport consider necessary testings at children of a level of development of flexibility, dexterity, abilities to manifestation of dynamic force and preservation of dynamic balance.

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Norms, standards and tests in the structure of the construction of monitoring physical development, physical fitness and physical state

Abstract. ***Purpose:*** *To determine the structure of the construction of monitoring physical development, physical fitness and physical state of the controlled segment of the population.* ***Materials and methods:*** *analysis of scientific literature on the research, the use of statistical material anthropometric data local population, the use of attributive semantic spaces for the presentation of the individual features of physical development and physical readiness of local population.* ***The results:*** *the structure of the construction of monitoring physical development, physical fitness and physical state as the basis for statistical process control capabilities of the physical capacity of the country's population.* ***Conclusions:*** *The certification of the physical condition and the physical capacity of the country will allow purposefully control the physical development of the population, taking into account regional, climatic and social conditions in the planning of its economic potential.*

Key words: *monitoring, biological age, norms, standards, criteria of physical development.*

Introduction. Monitoring of physical development, physical fitness and physical state is the basis of statistics of physical development and health of children, which serves sub-sector of health statistics. Its main task is the development and the timely receipt of reliable, scientifically sound data on morbidity, physical development of the population as a whole and its separate groups in order to develop measures to improve the health status of the population [1,2]. This issue is of particular importance in our country, which is marked next to resolutions of the Cabinet of Ministers of Ukraine.

In Ukraine, on January 15, 1996 №80 was approved by the Cabinet of Ministers "Regulations on state tests and norms of physical fitness assessment of Ukraine's population." The ruling was issued in accordance to Article 26 of the Law of Ukraine "On Physical Culture and Sports" and the state program of development of physical culture and sport in Ukraine. Resolution of the Cabinet of Ministers of Ukraine dated November 5, 2008 №992 recognized as the loss of the significance of the decision of 15.01.1996 year №80. From August 31, 2011 №828 the Cabinet of Ministers adopted a decree on approval of the concept for the National Programme for the Development of Social Physical Culture and Sports for 2012 - 2016. It noted that "the way of life of the population of Ukraine and the state of the sphere of physical culture and sport are a threat and a significant challenge for the Ukrainian state at the present stage of its development."

In the Kharkiv State Academy of Physical Culture, from 2010 onwards, systematically carried out research work in the sphere of physical culture and sport in Ukraine in accordance with the master plan for 2011 - 2015. Research topic - "Theoretical and methodological bases of construction of system of mass control and assess the level of physical development, physical preparedness of various groups of the population." Currently conducted research under the project "Innovative approaches to health-forming technology in the school physical education." Implementation of the research on these topics is aimed at the development of science-based approach for constructing a national system of physical education and creating a culture of healthy lifestyles.

The purpose of the study is to determine the structure of construction monitoring physical development, physical fitness and physical state of the controlled segment of the population-based screening control of specific features of all components of the monitoring framework.

Purposes of the study:

1. Identify the necessary standards and to develop appropriate tests to ensure the evaluation of the individual characteristics of physical development, physical fitness and physical state.

2. To systematize the assessment of the physical structure of the development, based on the account of biological age and the variability of its course.

3. Present a possible systematization of the existing age variability of physical development available to its characteristics of physical fitness and physical state.

Materials and methods. An analysis of the scientific literature on the research, the use of own materials inspection contingent of children of preschool and early school age. Using special attributive semantic space needed to represent the qualitative differences of the individual physical development and physical fitness of children. Ordering of the features of the observed differences in physical development and physical fitness of children develop methods for estimating slichimosti qualitative structure of multicomponent objects.

The results of research. Building a state of physical education based on systematic monitoring and processing the data to determine the corrective measures arising deviation standards of physical development of the population. The rate of physical development is based on the laws that ensure sustainable viable state of the body, which is manifested in the continuous flow of adaptive devices operational dynamics of the behavior of "normal" state. [3] The essence of this process is related to the rate of morphological and functional maturation of the biological systems of the body. One of the difficulties of solving this problem is to define a clear approach or establish the true biological age. Using Passport (chronological) age does not allow to correctly interpret the results of monitoring, because in a certain chronological age accurately observed significant heterogeneity contingent on your biological age. At the heart of the construction of the existing regulatory performance is statistical analysis of empirical data that allows you to create a general idea about the state of the population. Norma controlled assessment process in this case is the expectation of the resulting distribution and the degree of deviation from the established norm, reflecting the variability of its structure, is measured in fractions of Sigma.

The need for state standards required to establish the qualitative structure of physical development, determining the measure of remoteness controlled performance of their rules and the proper order of the measured characteristic in the ranked list of their submission. This allows you to reflect the qualitative assessment of the characteristics of the individual. In all cases, the size of the standard acts, playing the role of a comparative measure against which determined the distribution of the surveyed population. In practice, the value of the standard can be chosen arbitrarily, equally as any value is taken manifestations characteristic target population. Regarding the comparison of selected measures (standard) can assess the dynamics of development of the individual, or the rate of its current state, or the same performance characteristics of the population. The standard may remain the same as the comparison measurement unit at any time and in any geographical area. If selected as the standard norm, the standard speaks of her synonymous. However, in general, this change is incorrect. In this case it acts as the equivalent of the standard norm. An integral part of the monitor is the presence of test by which the measured expression controlled trait. Concerning the nominated test requirements of adequacy measurement controlled characteristics. The physical training is equally as in any other, always distinguish the general and special training. As a rule, in the assessment of general training includes the task of determining the level of the overall capacity to ensure controlled display options, and special training is to ensure quality of redistribution of the existing potential in the formation of a dynamic stereotype of behavior for the corresponding professional orientation activities. If you touch the general physical training, it should reflect the overall level of preparedness to perform basic, found in all cases of life motor acts such as walking, running, jumping, throwing, swimming. As used in this test should assess the amount of work done, the speed of its implementation, the accuracy, the amplitude of movements performed, the power to overcome the resistance, agility, select the desired solutions. Each of the selected motor characteristics is quantified, represented in the characteristic for their measurement, dimensional units. Different ratios exhibited motor qualities in providing motor actions generate particular variation of its construction, which is the specificity of sport specific movements. For comparison, the qualitative structure of the physical construction of the individual readiness of their absolute values must be translated in relative values - interest share units sigma distances from the expectation or the norms of distribution, which is set in a community survey.

This method allows a comprehensive analysis of the special and general fitness. In this case, the special role played by the standard against which the comparison is evaluation. It should be noted that in addition to the independent choice of the standard of comparison as the boundaries of the reference comparison, the standard can serve a function with respect to which the controlled variable. In assessing such qualities as endurance, you must allocate its absolute and relative performance. Absolute characteristic of endurance is characterized by time spent on the work of a given intensity or volume. In this case, a test to evaluate the performance of endurance is necessary to establish the nature of changes in the job given intensity.

In formulating the problem of choosing the optimal speed of execution of work to achieve its maximum volume in the allotted amount of time necessary to establish the optimal speed of its implementation, that is, its power or intensity, and take the time interval of the conservation of high intensity. Deviation from this period of time the optimum flow rate of work (its intensity) will be determined by the ratio of the average speed to the largest: (Nmean) / Nmax$\leq$1, where N - the power or intensity of work; N = A / t; A - work; t - time.

When this ratio is equal to unity level of physical fitness in relation to perception and balance of its forces or of special endurance reached its perfection. This operation can be performed in the evaluation of a difference of the average and maximum intensity: Nmax - Nmean $\geq$0. In the first case we received a dimensionless parameter, expressed as fractions of a unit, and the second figure is measured in units of dimension kg, m, c^{-1}, which is less convenient for comparing different dimensions.

Presentation of all kinds of survey quality structure of motor activity with the use of a single standard for each motor allows you to build quality generalizing individual characteristics of special physical preparation. A survey of the observed contingent considering biological age and used by non-dimensional representation of the level of physical fitness of motor characteristics allows you to set the relationship between the qualitative representation of the structure of the body and it adequate qualitative and quantitative structure of physical fitness.

The use of physical fitness assessment based on a comparison of the results desired and the average use of a versatile and can be used in any sport or any professional activity. The average result is always the best mode of performing the work, no matter what kind it is not expressed [4]

The duration of the implementation of physical work is defined by its intensity. In turn, the intensity of the mode of operation determines the fractional value of metabolic components, which influence the character of the development of fatigue. If after these accumulated residual effect no recovery, accordingly, the possibility of changes to show the previous maximum effect, but the changes and the average result. Standing remains only their attitude. It is the ratio of these characteristics, if they both belong to the same person, endurance determines the level of special physical readiness. The direct empirical studies to establish patterns of communication require processing of large amounts of empirical data, that at one time performed Y.I. Trofimets [5]. The effectiveness of using an index comparing the best results with an average assessment was tested in endurance athletes special physical training riders. However, the theoretical conclusion acceptable to any type of activity. The versatility of the result of research is that it carries on any activity having a cyclic repetition of its execution. In carrying out the cyclical nature of motorcycle racing is the fact that the athlete passes the track competitions several times repetitive circles. Each circle is characterized by speed of passage. If you choose the best result of the speed of passage of a circle (tl) and correlate it time to time average velocity (tmean), which is represented as the passage of the entire route, divided the number of laps, then the index of endurance special physical preparedness (DP) will have an expression: SP = tl / (tmean), where 0 <n $\leq$ 1. In this case, less than the joint venture, the worse the special training. If this coefficient is used to estimate the degree of complication of the job in the present example, this time during the passage of one circle and to activate tasks after start, it is possible to quantify the influence of task difficulty or

complication. In this case, this factor can be characterized as a measure of the solubility of the job or for the development of accessibility.

If you exercise consistently change in the index (JV) for the development of the job, its dynamics indicate the rate of learning or adapting to this level of complexity. Establishing a consistent increase in the absolute value of the complexity of the task and change (SP) to the level of the asymptotic behavior (the point where the value does not change in the interval (0 <n <1) indicates the limit of learning. Change (SP) in adjusting to the increasing load reflects the rate learning. The remoteness of the asymptotic value (DP) of 1 indicates a marginal distinctiveness, which is available to the individual in its current state and the possibility of improving technology in overcoming the imposed job complexity. The versatility of this indicator is due to the fact that the basis of his behavior is an exponential function, which is for all its transformation remains unchanged [6]. This fact allows using a set or selected standard against which assessed physical fitness, set the level of individual physical fitness of both qualitative composition, and the level of availability of the absolute values of the load for each biological age based on the individual the nature of its course.

Quality orientation of physical fitness as the general and special, estimated specific to their professional orientation. If the standard is the level of respect of which the assessment of physical fitness, the tests reflect its quality orientation. The level and quality orientation of physical fitness of the border have access to every biological age. Determination of the arsenal of physical activity in terms of its qualitative and quantitative availability of each biological age is the basis for building a state system of physical education. The relationship between the concepts of standards, norms and tests, it should be understood that the standard serves as a reference level against which the comparison is held private observation. The standard can be selected norm - a characteristic that is the most stable and most frequently observed in a population-based surveys. The tests are the focus of a specialized assessment of the level of physical development of the individual deviations from the established standard of quality and reflect the structure of the development. On the basis of this kind of information it is possible to carry out science-based construction of a national system of physical training of the population.

In this regard, in the past the most effective evaluation system of physical fitness of young people was a complex BGTO and TRP. The absence of a period of sufficient knowledge of the individual, regional and population norms have resulted in 80 years of the twentieth century to the accumulation of significant discrepancies use of physical education of its tasks and thorough review of its appropriateness, that ended in the rejection of its use and the loss of much experience, expressed Statistics accumulation of information about the delivery of standard regulations and on the basis of physical fitness assessment of students. Currently in Russia, China re-introduced a similar system of government control over the level of physical development, physical preparedness and fitness of the population.

A major shortcoming of the previously held annually monitoring the physical fitness of students was to evaluate the results of putting established standards in strict accordance with the age rules, without taking into account individual features of physical development, and the existence of regional norms, defining not only the specifics of the physical development, but also the time of the biological maturation of the body. Only since the 80s of the last century to raise the issue of regional standards of physical development and assessment standards of physical fitness age in their respective regions. During this period, I addressed the question of determining the age of school readiness. The desire to scientifically substantiate the beginning of schooling of children six years of age has led to government programs “child health”, “student health”, aimed at studying the characteristics of the individual development of children of preschool and early school age. Research in this area conducted by PI “Institute for the protection of the health of children and adolescents is much” (Kharkov) in Kharkiv and Dnipropetrovsk regions, allowed to establish the range of variability of the age of school readiness among the local population of children 6 years of age, which was ± 2 years [7]. Studies have not received their further development due to lack of time on well-founded scientific basis of the reasons for the differences between the passport and biological age. The fact of the variation with respect to the biological age of the passport proved insufficiently studied and the limits of variation with respect to the biological age of the passport are not installed. In addition, no single approach has been developed determine biological age, and existing methods gave very different results in terms of their application to a single individual.

The work carried out in the Kharkiv State Academy of Physical Culture [8; 9], given a reasonable understanding of the mechanism of individual physical development and the nature of the variety of features displays structures of biological age. The results obtained allowed to justify not only the focus of a variety of high-quality biological development of morphological and functional structures, but their rate of biological maturation [10]. This fact allowed to justify the existing difficulty of assessing the child’s body type as a child, and the reasons for his “drift.” Quality variation of morphological and functional maturation of biological entities define the general direction of development and the rate of maturation. minimally sufficient criteria for tracking indicators of this fact are the height and weight of the child, that it is advisable to monitor the month during the first year of life, and at least half a year in the next 3 years of life. The accumulated material with sufficient accuracy to determine the changes in growth and development, as well as their rate of flow [11].

The presence of two anthropometric characteristics of height and weight allows for a comparative analysis of the inter-regional standards of physical development, received at the same time collect information by region or of the region in different years of gathering information, and physical development of the individual with respect to normal physical development of the region.

Implementation of such a comparison was made possible by the published statistics Kiev NIIOHMADET. Using data from the dynamics of growth-weights of the same chronological age children 3; 4; 5; 6 years of historical data and 4; 5; 7 years, obtained at different times, you can compare the level of physical development of children of the same age. When comparing the data Rostov-weight ratios of children of all ages a certain region, it is possible to note the nature of the growth characteristics of a weight variation of physical development. With the dynamics of growth-weight ratio for different years of physical development of a region can set individual features of physical development and the biological age of an individual, which is shown in Figure 1.

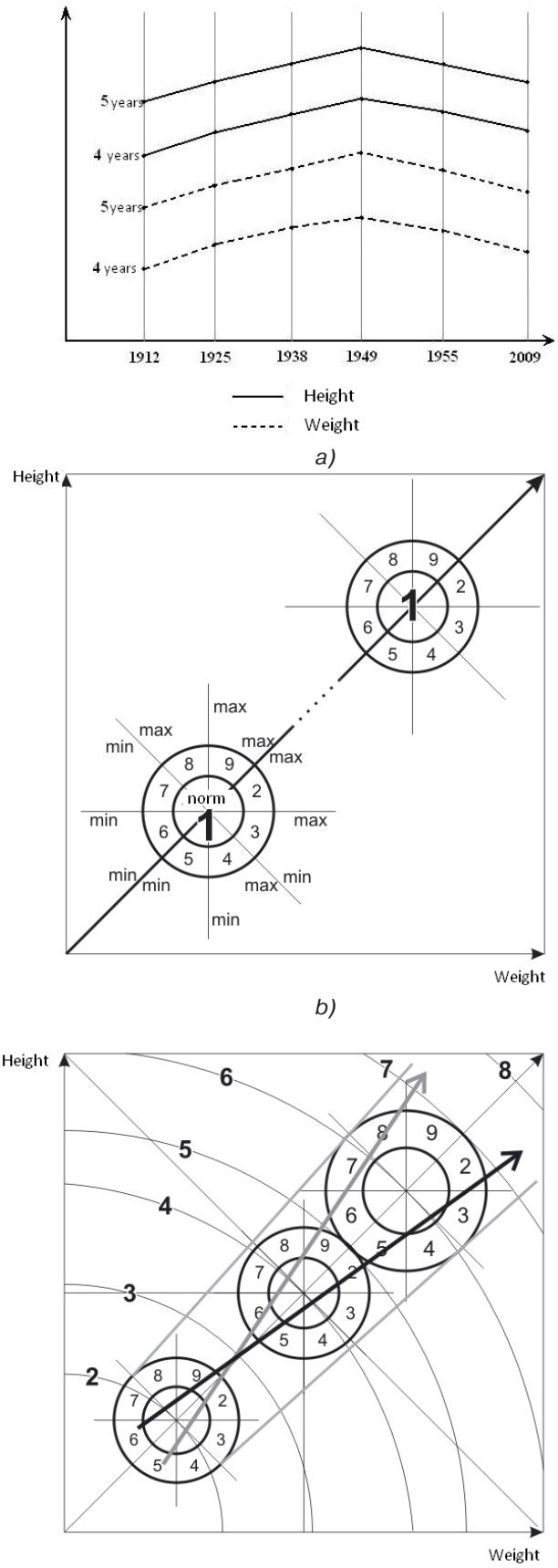

Fig. 1 Age Rostov-weight ratios of physical development in ontogenesis.

Figure a) Diagram of comparison of physical development of girls 4-5 years of 2009 from previous years in 1912, 1925.1938, 1949, 1955. Figure b) Diagram of physical development of children 3-6 years old. Figure c) Diagram of a comparison of the standard and its background line of individual development, which gives rise to the difficulty of determining the structure of somatotype in early childhood (concentric circles - years of life).

Every age can be identified in the development of delayed, normally developing and advanced, as well as the uneven development that allows, in accordance with this graduation highlight nine zones, with characteristic specifics of Rostov-weight ratios.

In these charts use a scale with the standard unit of measurement studied characteristics. The presented results of the characteristics of the subjects relative to the time of their development have a certain trend. Each of the above characteristics has a range of deviations relative to the corresponding values of a trend that reflects the level of lag rules or advance its development. Similarly, the other is characterized by a controlled rate. Their joint performance in feature space is the totality of possible combinations of the speed of development of each of the above characteristics. Their equity ratio determines the viability of the somatotype shaping. Consequently, if in the ongoing monitoring exercise control over each individual, it is possible to set individual features of biological development and direction of movement of its growth index-weight ratio.

In monitoring changes in height, weight, chest circumference and evaluate any indicator of biological age, there is a range of variations of the characteristic values with respect to its mathematical expectation. In the prior art describes the commensurability multidimensional characteristics matched individuals, if necessary detail the structure of their body and directional characteristics of biological age [12]. Normal development is considered to be occurring only where the same characteristics of the expectations of all monitored indicators of biological maturity.

However, to establish a general pattern of this process is sufficient evidence of the dynamics of weight and body length. In each chronological span of physical development of the individual, these two characteristics have a range of variation coefficient of their relationship, which changes (pulses) with respect to its trend. If you think of all the options for change borders weight, height, range ripple these indicators and their average statistical value in the corresponding semantic space is indicative of the results of monitoring carried out systematically monitoring, then it is determined by the general pattern of physical development of the process [13] (Figure 2)

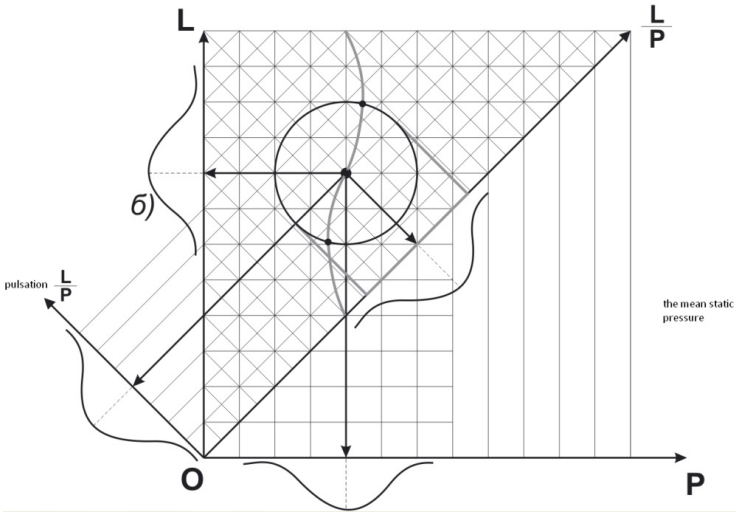

Fig. 2 is indicative of a semantic representation space interdependent relationship growth trend, the weighting of the index; variations in relative growth of constant weight; variations in weight relatively constant growth; *Variations ripple Rostov-weighting factor.*

L - body height (length); P - body weight; L / P - Rostov-weighting factor (ratio of constant relations); pulsation of L / P (trend fluctuation L / P). Each coordinate scale of feature semantic space indicated a normal distribution curves characteristic variation. In the area of the joint display of interdependent relationships integral curve shows signs of a general point, which determines the behavior of the trend factor L / P.

In this case, the physical development of the population is considered as an integral object, reflecting the variability of biological age local population, which is the object. Full analog of these characteristics observed in the physical development of the individual. The difference is that the initial ratio of the individual physical development and the rate of flow have their initial values, which leads to the displacement of their trend over other sectors with respect to its initial position. This movement is most intense in the first decade, which is difficult to determine the child's somatotype. Systematic monitoring of the behavior on growth-weights implemented from the date of birth of the child, allows you to fully carry out its forecast somatotype and predisposition to certain types of physical activity orientation, and provide preclinical diagnosis characteristic of his constitutional diseases.

The established pattern of organization structure of biological age and the rate of flow reveals the features of the individual physical development, which greatly extends the capabilities of the monitoring carried out in monitoring and forecasting the physical development of the population and the planning of its potential mobility. An essential constituent of the physical features of an individual is his physical condition.

Physical condition is an integrated assessment, which includes a physical indicator of the health of the individual, constitute the basic framework of his physical abilities and the potential operational physical capability, which provides a process of adaptive behavior aimed at meeting the needs of preservation of the equilibrium state of the body in response to different environmental influences.

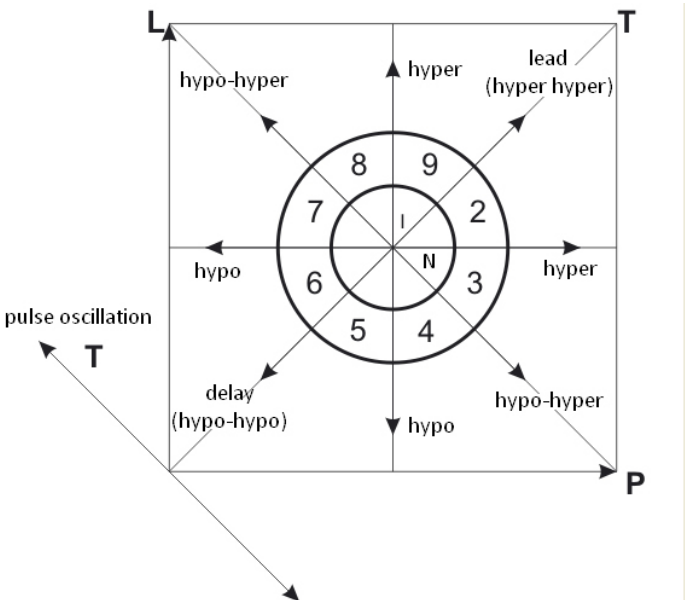

Fig. 3. Dynamics of changes in Rostov-weight ratios in the process of physical development, presented in indicative of semantic space.

L - coordinate axis showing the length of the body; P - body weight; P - ripple variations Simply-weight otnoscheniya; T - the trend of development of standards; N - normal state of relations L / P; (1 - 9) area variation relationship L / P of their rules state relations, reflecting different initial conditions of the individual characteristics of biological development. The radius vector emanating from the H-point, point to the direction of growth and weight violations in individual development and physical features of the structure of biological age.

The term “physical health” has many definitions, and the content is still not a universally accepted definition in terms of the requirements for its quantitative study. World Organisation adopted the definition of “health” as “a state of complete physical, mental and social well-being.” In this case, it applies only to the physical health and the possibility of a qualitative and quantitative assessment, believing that the other components are in compliance with the required standards. The statement that health does not allow direct measurement, as in the existing sources of information do not have information about the direct and immediate measurement of the level of health, not sufficiently substantiated. The reason for this is that such a definition can not be given without the principle of unity of the object and the environment of its existence, considered as a whole education. In this representation, the concept of “physical health” reflects the level of viability of the system “Object - environment” and reduced to the statutory rate of its condition.

The study of quantitative and qualitative characteristics of the health status of the population in general and certain of its individual or the individual’s contingent, revealed a statistically significant association with vitality against environmental factors. Health status in the overall presentation is based on the statistics of morbidity, physical development of statistics, statistics of children’s health and maternity, the receipt of which can provide a systematic monitoring.

The second component of physical condition that determines the physical capacity, physical capacity is operational. Reducing the operational capacity of the state characterized by the development of fatigue. Its occurrence is manifested in various mechanisms to reduce capacity, depending on the specific physical activity performed, and its intensity. In general, for such reasons are: the occurrence of large amounts of metabolic products resulting from the implementation of intensive work.

Paramount in this regard is the accumulation of carbon dioxide (CO2) and the lack of oxygen (O2), which violates the partial pressure of these gases in the blood and reduces the intensity of the oxidation processes. This stage is characterized as “suffocation.”

Immediately following it is shown the accumulation of metabolic products, as their rate of accumulation exceeds the capabilities of functional systems of their removal from the body. As the most typical reason in this case is the failure of the transport function of blood circulation and inconsistency potential excretory systems. This stage is characterized as a “blockage”, leading to disruption of homeostasis.

As you reduce the intensity of physical activity performed by the determining cause of fatigue developed by acts “flow” of energy potential. As it approaches the maximum permissible limit is increasingly affected by stage of “exhaustion”, evokes a feeling of weakness and defense response associated with a decrease or complete cessation of performance.

As an independent factor projecting the cause of fatigue is the coordinating function of the redistribution potential to provide regional blood supply in the emerging request morphological and functional structures of the dynamic stereotype, providing specificity to perform physical activity. This stage is characterized as a “central inhibition.” This division of the factors influencing the development of fatigue in the stage of their impact is conditional and defined common significance in the accumulation of them depending on the intensity of the work. In fact, they are simultaneously present in the process proceeds motor activity. Total limiting their impact, depending on the intensity of the activities carried out, determines the length of its course at an exponential characteristic.

On the physical condition significantly affected by the current state of physical health (physical health) or the health

of the body, which reflects the current state of the organs and systems of the human body; their level of development and functional features. Processes or phenomena in any field, what character they were not always carried out on a specific basis, which allows you to generate the necessary variation of the operational conduct adequate environmental changes. In all cases, the process of building adaptive behavior is possible only if necessary and a sufficient level of total potential readiness for the implementation of the appropriate operational adaptive behavior. Almost always in the background of a certain level of operational readiness of the total proceeds continuous surge in strength, quality focus and duration, necessary to ensure the preservation of operational equilibrium in relations with the media host.

Physical health, as noted above, is one of three components of the general concept of health and has no clear definition and sufficiently unambiguous evaluation criteria. This is a natural phenomenon in the evaluation of complex multicomponent systems. Their assessment and classification depends on the number of dedicated features and actions of their distinctiveness. In this case, the health of a qualitative characteristic, consisting of a particular set and sequence specific to the phenomena of the components and the strength of their severity.

Health, like any phenomenon is an expression of quality and strength of its display, which is the subject of physical condition. Failure to resolve this question was that there were no clear idea of concepts such as biological age and the criteria for its determination, individual norms and basic principles of its adaptation to changing environmental conditions [14]. Establishing the structure of algorithm of the individual physical development and maturation of morphofunctional organism in ontogeny suggest the establishment of individual standards of physical development. On the basis of principles to guide the process of self-organization and the establishment of the essence of the concept of individual standards as a phenomenon and as a process that ensures the preservation of the equilibrium state of the object with the environment of its existence. On the basis of this became possible solutions to issues such as the formation of purposeful adaptive behavior aimed at the preservation of the equilibrium state of the system “object environment” [15].

Depending on the interaction of the object with the medium of his stay, the dynamics of changes in the state regulations may occur in the following ways: change the range of functional optimum position while maintaining the modal values of the state standards; transgression of the modal values of the state standards without changing the boundaries of functional optimum, but move them together with the modal value of the state standards; and all the possible variants with simultaneous participation of the first two. The success of this process is determined by commensurability of the ongoing process of operational adaptation of the rate of change in environmental conditions.

All running processes are reflected in the character of changes in the activity of functional systems. The most accessible to observation in this regard are: the respiratory system, changes the dynamics of the cardiovascular system work, changing sensorimotor reactions. These changes reflect the current operating status, the presence of adequate residual capacity and an indicator of current physical condition.

The monitoring of the respiratory system is possible keeping the frequency and depth of breathing (cycle length and the duration of its phases) for certain time intervals. Each of these characteristics is its change range, which includes the current operating status or level of tension providing an averaged demand, and rapid changes in the adaptation range amplitudes of these oscillations (known as Pulse reserve).

This allows you to identify a potential medium voltage level with respect to which in the corresponding range from the minimum to the maximum limit is pulsating operational regulation satisfy the request. The average potential changes its level, depending on the accumulated surplus or shortage meet the operational regulation. With the change in the average level of change and rapid pulsation border.

Features of these changes may be due to different orientation range limits (max - min). All these characteristics are interdependent in providing the regime meet the current needs of the body. Since they are all measured in the same units, and their interaction can be observed in their present relationships, which are considered indicative of a unified semantic space compared with single measure of performance. This allows you to set a record as the constancy of the observed relationships and constancy of occurrence of these relations in a joint interdependence of functional activity.

Any functional activity, the manifestation of its activity, has a certain level of tension, an adequate level of activity required to maintain a state of equilibrium with the environment, on the background of this state made rapid adaptive behavior, which manifests itself in a certain range of pulsation characteristics manifestation controlled functional activity. This range is determined from the sweep oscillation boundary minimum value to a maximum value of the boundary. As the minimum and maximum level of manifestation pulsating values of functional activity has the morphological and functional mechanisms.

Depending on the operational direction of adaptive behavior of each of their boundaries may increase or decrease as a necessary and sufficient response to the need arose. Each of the states borders operative behavior can be characterized by three areas of change. Of the three options for the status of each of the boundaries of their two joint combination generates the eight options. The level of intensity of the functional system is equal to their arithmetic mean value. That is the sum of the current value of 0.5 minimum and maximum correspond to the trend of the static state.

Graphically this can be represented as follows (Fig. 4)

The plane of the second two-dimensional space is rotated with respect to first 45є. A characteristic feature of this area is in the zone of intersection of the joint behavior of generalizing the point values of all four characteristics describes a pattern that reflects the interdependence of functional relations of a functional system under consideration. This pattern is acceptable to describe any of the functional systems. This marked the scale in the nomogram will have different specific units, but in all cases it will be a ripple on the borders of the state of a running operating system and its trend.

In terms of the cardiovascular system, in particular, the characteristics of the blood pressure; dynamics of its frequency characteristics; muscle tension when performing any motor actions; the work of the endocrine glands.

By virtue of the established general laws of this phenomenon can be obtained separately by the reflections of the functional state of the system to get the general structure of its behavior and on this basis assess the current functional

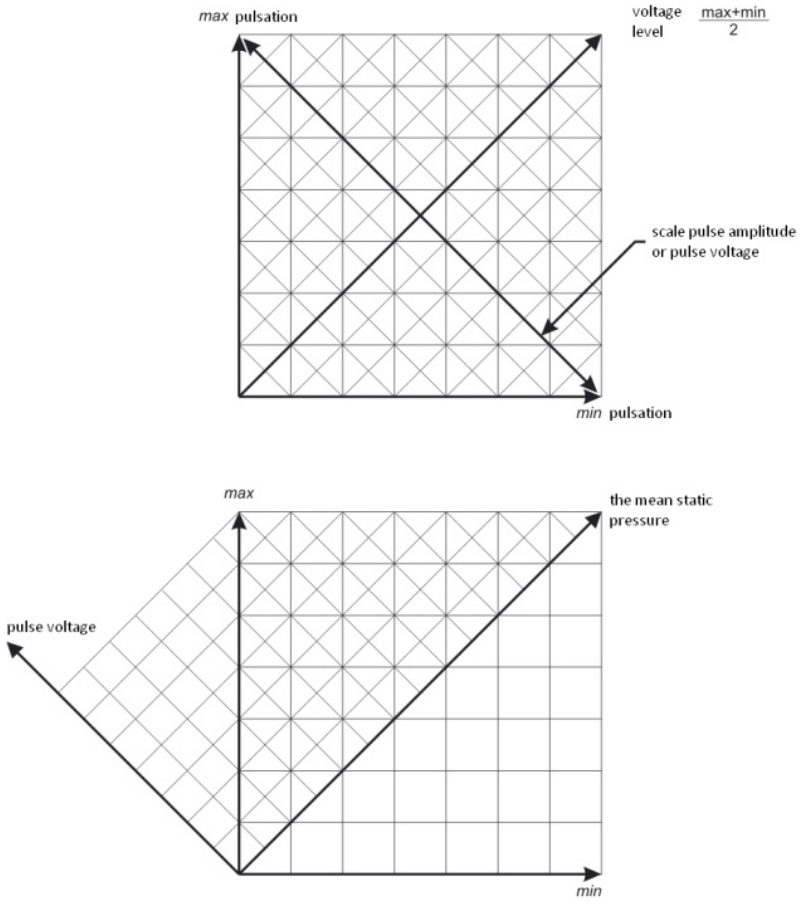

Fig. 4. The space relationship baseline performance characteristics and their derivatives.
a) the initial structure represented by the semantic space of feature; b) the scale of the amplitude ripple is offset along the mid-scale voltage to align statistical began counting all four scales.

status.

Restoration of the overall structure of the physical functional status of individual selective view the current status and their relationship gives the dimensionless quantity, which reflects a constant ratio criterion for the state, regardless of the absolute values. Regarding the boundaries of existence criterion of constancy of occurrence of such a nature constant ratio criterion is given an opinion on the current physical condition, divided into components of the static state or level of physical health and operational adaptation potential or current physical condition, reflecting the level of tiredness of the body as an indicator of a temporary decline in performance. Thus the current state of the division is carried out on the total and incremental in one step to the next state or step "ripple", specific to the general condition (physical health), which acts as an objective assessment of the qualitative and quantitative characteristics of physical condition and physical health.

Conclusions:

The reason for the difference passport and biological age is the mismatch rate of maturation of morphological and functional structures of the body involved interdependent relationships that determine its viability. The variability of this relationship stand out synchronously developing morphological and functional maturation of systems that have a range of differences from the maximum observed delay in development to the maximum occurring timing. In this range of possible simultaneous with sufficiently high accuracy the difference in the chronological age and biological individual.

In asynchronous development of morphological and functional structures of the body is observed allometry of their development, which requires a definition of each of controlled biological maturation index set its rate of maturation and measure the differences from the norm of this process. This inconsistency creates not only a different speed of biological development, but also affect the direction of flow, which leads to a trend of movement of the passage of the individual from one area of the initial state through a number of different, different at the time of controlled. This effect is extremely complicates the task of assessing and predicting the process of biological evolution.

To evaluate the biological age and peculiarities of its course, it is minimally sufficient evidence of growth in body weight and length. For individual control of these parameters correlated to the population or regional standards, with the required accuracy can set the speed and direction of biological development, which allows to determine the dynamics of the somatotype and implement preclinical diagnosis of specific violations of constitutional viability of the organism.

Any functional activities aimed at preserving the life of the organism is based and can be represented by such indicators its functional state, such as: the level of intensity required, the operational adaptation of its pulsation characteristic of the level of tension. Presented in a special indicative of semantic space, the observed fluctuations of controlled features allow for their dynamic to establish the current level of operational readiness (system voltage) characteristic of her rapid adaptation pulsation of this state and to establish the regularity of the trend of functional strength that allows you to set

individual rates of functional state and zone its optimal expression. In evaluating the physical condition of its presentation, this technique allows you to share a basic condition of functional readiness and adaptive swings its activity. Basic readiness reflects physical health, and the boundaries of adaptive fluctuations reflect the level of physical fitness. This result was obtained on the basis of the use of attributive semantic spaces and presented for the first time.

Further direction conducted research related to the development of methods of construction monitoring physical development, physical fitness and physical state in accordance with the subject of scientific research "Innovative approaches to health-forming technology in the school physical education."

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Cheerleading exercises influence on 5-9th forms the schoolchildren's coordination abilities

Abstract. ***Purpose:*** *to study cheerleading influence on individual demonstration types of coordination abilities for pupils of 5–9 forms.* ***Materials and Methods:*** *theoretical analysis and generalization of scientific and methodical literature, pedagogical testing, pedagogical experiment and mathematical statistics methods.* ***Results:*** *indicators of the development level of the ability to control the movements by the dimensional and temporal parameters, as well as degree of their change under Cheerleading training influence for pupils of 5–9 forms of a secondary school are presented.* ***Conclusions:*** *cheerleading usage had a positive influence on the degree of demonstration of individual forms of coordination abilities for secondary school pupils.*

Keywords: *coordination abilities, cheerleading, secondary school pupils.*

Introduction. Now the unsatisfactory level of physical preparedness, functional state and health is noted among children of school age that is directly connected with the essential decrease in the general physical activity of pupils [1; 4; 5; 7; 8]. According to experts, the modern practice of physical training of pupils doesn't provide the necessary level of their physical preparedness [6]. In this regard the search of the most effective remedies and methods of the development of physical qualities, and, in particular, coordination abilities are necessary.

Coordination abilities occupy one of the central places (among other physical qualities) in the development and formation of the main morphological and functional structures of organism [11].

A number of experts (T. M. Bala, I. P. Maslyak, 2008, 2011; I. A. Kuzmenko, 2013, 2015; K. O. Olefirenko, 2014; R. I. Boychuk, 2015; V. Kirichenko, 2015, etc.) dealt with issues of the development of separate manifestations of coordination abilities in children of different age, due to a change or addition of the maintenance of lessons of physical culture with various means, methods and forms. However in available to us scientific and methodical literature it isn't revealed the works concerning the influence of cheerleading on indicators of the level of development of coordination abilities of pupils of the 5-9th classes that points to expediency of studying of the influence of exercises of cheerleading in the course of classes in physical culture at pupils of middle classes. It should be noted that cheerleading is one of the innovative means of physical training in Ukraine. According to E. A. Zhuchenko [14], classes by cheerleading promote the all-round development of the personality (physical, intellectual and spiritual), the formation of vital motive skills, and education of physical qualities. Thus, this scientific work is actual and timely.

Communication of the research with scientific programs, plans, subjects. The research was conducted according to the Consolidating plan of the RW in the sphere of physical culture and sport for 2006-2010 of the Ministry of Ukraine for family, youth and sport in the direction 3.1 " Improvement of the process of physical training of pupils in educational institutions " on a subject No. 3.1.4 " Improvement of the process of physical training of pupils in educational institutions of a different profile " (number of the state registration is 0106U011983) and to the thematic plan for 2011-2015 of Ministry of education, science, youth and sport of Ukraine in the direction 3. "Theoretical-methodological and technological bases of physical training and sport for all" on a subject No. 3.1 "Improvement of programmatically-standard principles of physical training in educational institutions" (number of the state registration is 0111U001733).

The objective of the research: to study the influence of cheerleading on separate forms of manifestation of coordination abilities of pupils of the 5-9th classes.

Material and methods of the research: theoretical analysis and generalization of scientific and methodical literature, pedagogical testing, pedagogical experiment and methods of mathematical statistics. The tests presented by V. A. Romanenko [13] were used namely for the definition of the level of development of ability to management of the movements on existential parameters of pupils of the 5-9th classes: a difference in run on 15 m by a face and a back forward (s), run by a "snake" of 30 m (s).

The researches were conducted on the basis of the comprehensive school No. 119 of Kharkov for 2010–2011 academic years. 255 pupils of the 5-9th classes took part in them from who five experimental and five control groups were made. All children who were taking part in the experiment were almost healthy and were under supervision of a school doctor.

During the research pupils of control groups were engaged only according to the standard program for general education educational institutions "Physical culture. 5–9 classes", and the educational process on physical training of pupils of experimental groups was added with the variable Cheerleading module developed by us which included such elements as: high V, low V, T motion, half T, muscle man, touchdown, tuck, spread eagle, double hook, Thigh stand, Staddle lift, Suspended split, etc. [3]. The specially picked up exercises of cheerleading made the maintenance of lessons of the Cheerleading module, and also joined in the preparatory part of a lesson of other variable modules, in the system of organized changes and were given in the form of homeworks.

Results of the research and their discussion. The received results of the primary research testify to lack of reliable distinctions in results of coordination tests of pupils of control and experimental groups on all studied parameters ($p>0,05$).

In the analysis of the data reflecting an ability to orientation in space (a difference in run by a face and a back forward), generally reliable decrease in a difference in run on 15 m by a face and a back forward with age at boys ($p <0,05–0,001$) and doubtful decrease in a difference in run at girls is revealed ($p>0,05$). Thus the prevalence of results of boys is revealed

over indicators of girls, however these distinctions are doubtful (p>0,05).

When comparing results of the research with the norms offered by V. A. Romanenko [13] the low level of ability to be guided in space at pupils of the 5-8th classes is found which according to a rating scale corresponds to 1 point. Results of pupils of the 9th classes weren't compared to norms because of the absence of those in available to us scientific and methodical literature.

After carrying out the experiment the reliable decrease in a difference in run on 15 m by a face and a back forward both at boys, and at girls of experimental groups is revealed (p<0,05–0,001). The exception is made by indicators of boys of the 7th class where the difference in running by a face and a back forward decreased doubtfully (p>0,05). So, at boys of the 5th class results improved for 26%; the 6th class – for 32,5%; the 7th – for 36,8%; the 8th – for 29,3% and the 9th class – for 23,5%, at girls respectively – for 20,3%; 22,3%; 31%; 22,5%; 23,2%. Thus, the most considerable gain in the indicators reflecting ability to be guided in space is noted at pupils of the 7th classes. Thus more essential gain in indicators of boys is recorded, than girls.

In the analysis of data in age and sexual aspects it is revealed that the tendency of distinctions remained invariable in comparison with the basic data. It should be noted that the prevalence of indicators of boys over the data of girls began to have a reliable character after the experiment (p<0,01–0,001), except for results of pupils of the 7th class where distinctions are doubtful (p>0,05).

Considering the results of pupils of control groups received after the experiment a minor change in indicators of run by a face and a back forward is revealed (p>0,05). So, at boys of the 5th class results improved for 2,2%; the 6th class – for 2,3%; the 7th – for 2,5%; the 8th – for 1,8% and the 9th class – for 0,6%, at girls respectively – for 1,7%; 1,3%; 2,2%; 1%; 1,6%.

The comparison of these indicators depending on age and sex didn't reveal essential changes in comparison with the basic data.

The data of the studied experimental groups became authentically best of all than results of pupils of control groups after carrying out the experiment (tab.) (p <0,001).

When comparing of the obtained data with the norms developed by V. A. Romanenko [13] it is revealed that results of boys of the 5-6th classes increased on 1 point and began to correspond to the below average level of the development of ability to orientation in space (2 points), the data of the studied 7-8th classes increased by 2 points and began to correspond to the average level of development of ability to orientation in space (3 points), the data of girls of the 5-6th classes also positively changed, however it wasn't reflected in a rating scale also they as well as before the experiment, answer the low level of development of ability to orientation in space. The analysis of results of pupils of control groups testifies that they also changed a little, however it wasn't reflected in a rating scale in any way.

Thus, cheerleading application, positively affected the extent of development of ability to orientation in space of the studied experimental groups. Indicators of pupils of the 7th classes improved most considerably.

Considering indicators of ability to the management of the movements on results of a performance of run by a «snake», generally the reliable improvement of results with age both at boys, and at girls of all studied groups is revealed (p <0,05–0,001). Analyzing these data on a gender sign, it is revealed that indicators of boys are reliable better than results of girls (p<0,01–0,001). The exception is made by the data of pupils of the 7th, 9th classes of control group where the prevalence of results of boys over indicators of girls are doubtful (p>0,05).

When comparing of the received results with the norms presented by V. A. Romanenko [13] it is revealed that indicators of girls of the 5th classes correspond to an assessment 3 points, and boys of the 5th and pupils of the 6-9th classes an assessment 4 points that on a-level scale corresponds to an average and above an average to the level of development of coordination abilities.

After carrying out the experiment the reliable improvement of indicators both at boys, and at girls of experimental groups is received (p<0,05–0,001). An exception indicators of boys of the 7th class, where the improvement of results are doubtfully (p>0,05). At boys of the 5th class results improved for 4,7%; the 6th class – for 6,4%; the 7th – for 10,6%; the 8th – for 9,6% and the 9th class – for 8,6%; at girls for 3,8%; 14,7%; 14,1%; 11,8%; 12,6% respectively.

Thus, the most considerable gain in the indicators reflecting ability to management of the movements on existential and dynamic characteristics is noted at boys of the 7th and girls of the 6th of classes. Thus more essential gain in indicators of girls, than boys is recorded.

Analyzing the obtained data in age and in sexual aspects, it is revealed that the tendency of distinctions remained invariable in comparison with the initial research. Thus it should be noted that after the advantage of indicators of boys over data of girls began to have a doubtful character the experiment (p>0,05), except for results of pupils of the 5th, 8th classes where distinctions are reliable (p<0,01; 0,001).

Considering the results of pupils of control groups received after the experiment their minor change is revealed. So, at boys of the 5th class results improved for 0,6%; the 6th class – for 1,3%; the 7th – for 2,4%; the 8th – for 6,3% and the 9th class – for 2,5%, at girls respectively – for 0,7%; 1,2%; 2,6%; 1,4%; 1,5%. When studying these indicators depending on age and sex the lack of essential changes is revealed in comparison with the basic data.

After carrying out the experiment it is revealed (tab.) that the data of experimental groups are reliable better than results of pupils of control groups (p <0,05–0,001).

The comparison of the received results in run by «snake» with the standard estimates presented by V. A. Romanenko [13] showed that results of girls of the 5th class increased by 2 points and began to correspond to an assessment of 5 points, the results investigated the 6-9th and boys of the 5th of classes increased on 1 point and also began to correspond to 5 points that corresponds to the high level of ability to management of the movements on existential characteristics. Thus the obtained data of pupils of control groups didn't reveal essential changes on a rating scale.

Thus, cheerleading application positively affected ability to management of the movements on existential characteristics

Comparison of average values of coordination abilities of pupils of experimental and control groups after the experiment

Classes		Groups				t	p
		n	*Experiment*	n	*Control*		
Indicators, $\bar{X}$±m							
Difference in run on 15 m by a face and a back forward (s)							
5 class	*B*	13	1,59±0,07	16	2,19±0,08	5,87	<0,001
	G	15	1,81±0,06	9	2,30±0,08	5,11	<0,001
6 class	*B*	13	1,35±0,07	13	2,11±0,06	7,81	<0,001
	G	14	1,71±0,07	10	2,23±0,07	5,44	<0,001
7 class	*B*	19	1,22±0,05	14	1,96±0,10	6,93	<0,001
	G	6	1,47±0,07	10	2,27±0,10	6,36	<0,001
8 class	*B*	16	1,16±0,07	13	1,63±0,11	3,51	<0,001
	G	14	1,45±0,07	14	1,89±0,12	3,24	<0,001
9 class	*B*	12	1,14±0,06	12	1,56±0,10	3,52	<0,001
	G	16	1,39±0,06	6	1,88±0,15	2,98	<0,01
Run «snake» 30 m (s)							
5 class	*B*	13	5,88±0,16	16	6,28±0,07	2,23	<0,05
	G	15	6,85±0,10	9	7,46±0,12	3,87	<0,001
6 class	*B*	13	5,58±0,10	13	5,90±0,12	2,12	<0,05
	G	14	5,81±0,06	10	6,74±0,0 9	8,42	<0,001
7 class	*B*	19	5,30±0,15	14	6,01±0,14	3,51	<0,001
	G	6	5,60±0,22	10	6,24±0,20	2,18	<0,05
8 class	*B*	16	5,16±0,08	13	5,48±0,10	2,55	<0,01
	G	14	5,54±0,13	14	6,24±0,11	4,17	<0,001
9 class	*B*	12	5,11±0,09	12	5,42±0,10	2,33	<0,01
	G	16	5,33±0,08	6	6,08±0,11	5,43	<0,001

of pupils of experimental groups. The most essential gain in indicators is observed at boys of the 7-8th and girls of the 6-7th classes.

Conclusions. Thus, results of the research allow drawing the following conclusions:

1. The data of the primary research testify to the low level of development of ability to be guided in space and above an average level of development of ability to management of the movements on existential characteristics that answers the 1st and 4th points respectively.

In the age aspect the reliable improvement of results with age, both at boys, and at girls of the studied groups is generally observed ($p<0,05–0,001$). In the sexual aspect it is revealed that indicators of boys in all studied parameters authentically prevail over results of girls ($p<0,01–0,001$).

2. The inclusion in the process of physical training of exercises of cheerleading positively affected the level of development of ability to be guided in space and the level of development of ability to management of the movements on existential characteristics of pupils of experimental groups which increased on average by 1 point. The greatest gain in indicators is recorded at pupils of 12 years old. The studied indicators of pupils of control groups didn't undergo considerable changes after the experiment.

The analysis of results of the repeated researches in age and sexual aspect didn't reveal considerable changes, in comparison with the initial data.

3. The conducted researches testify to the positive influence of the offered by us sets of exercises of cheerleading on the level of development of separate manifestations of coordination abilities of pupils of the 5-9th classes that gives the chance to recommend to teachers of physical culture to include in the educational process on physical training of pupils of

middle classes the cheerleading exercises which are developed by us.

Prospects of further researches in this direction can be carried out by the definition of the extent of influence of classes by cheerleading on the level of the development of feeling of a rhythm of pupils of middle classes.

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Features of use of modular training system armsportsmen 16–17 year olds in the annual macrocycle.

Abstract. ***Purpose****: to determine the most effective ratio of different means and methods of training 16–17 year olds armsportsmen the application of the block training system in the annual macrocycle.* ***Material and Methods****: 30 armsportsmen investigated 16–17 years to 15 in the control and experimental groups; analyzed and summarized the data of scientific and methodical literature, conducted teacher testing, pedagogical experiment, and methods of research used functional state of cardio-respiratory.* ***Results****: it was found that the block system of training 16–17 year olds armsportsmen allows significantly increase the level of morphological and functional training base, improves functional indices of the cardiovascular system.* ***Conclusions****: the experimental training program for 16–17 year olds armsportsmen based modular training system allowed the athletes to create the experimental group was significantly higher level of morphofunctional sports training base, significantly improve the functionality of the body athletes, contributed to a high level of fitness and sports is recommended to practice the preparation armsportsmen.*
Keywords: *modular system, static exercises, the annual macrocycle, morphofunctional base.*

Introduction. Arm sport is one of the young sports. In this regard problems of planning, programming of the training process are presented in the form of debatable options of training of sportsmen in scientifically-methodical literature.

Modern arm sport has a power character, but by the manifestation of motive abilities is a high-speed and power sport. At the same time it comes nearer to a fight on indicators of technical and tactical actions of sportsmen for the achievement of result in competitions.

The competitive exercise in arm sport needs manifestation of a big power tension, therefore this sport is very injury-prone. Before a direct single combat on a table it isn't recommended to start at once to the even physically-trained sportsmen as there is the high probability of receiving a serious trauma which can call into a question the subsequent lessons of arm sport, without the corresponding preparedness of the copular and articulate device of the top humeral belt to a specialized loading [3].

In this regard the search of the most effective ratio of different means and methods of training arm wrestlers gains a special relevance.

According to our data, the intensity of growth as forces, and static power endurance decreases, but the indicator of static force stores high growth rates in the aged development of armsportsmen in 16–17 years old [3].

Communication of the research with scientific programs, plans, subjects. The scientific research is executed by a subject of the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 by a subject 3.7 "Methodological and organizationally-methodical bases of definition of individual norm of a physical condition of a person" (number of the state registration is 0111U000192).

The objective of the research: to define the most effective ratios of different means and methods of training of armsportsmen of 16-17-years old at the use of the block system of training in an annual macrocycle.

Material and methods of the research. The theoretical analysis and synthesis of data of scientifically-methodical literature, pedagogical testing, pedagogical experiment, methods of the research of a functional condition of the cardiorespiratory system – vital index, heart rate, arterial pressure, coefficient of economization of blood circulation, systolic and minute volume of blood. 30 sportsmen of 16-17 years old on 15 took part in the control and the experimental groups in the research.

Results of the research and their discussion. The experimental program of training is developed on the basis of the structure of long-term preparation of young armsportsmen which was used for arm wrestlers of 16–17 years old at a stage of the specialized basic preparation. The period of 16-17 years old was chosen not casual: behind our supervision, the greatest loss of young sportsmen and their outflow from sport is observed at this age. It is apparently caused by their active entry into the society, the search of a personal "I am", places in life and society, difficulties of the competitive activity which is the share of the age of 16-17 years old.

The theoretic-methodological development of Y. V. Verkhoshansky about features of the block system of trainings is the basis for the experimental program [4]. The annual program of training includes 3 blocks: 1 – the block of the previous training; 2 – the block of the basic training; 3 – the block of the specialized training (tab. 1).

The use of the offered program of trainings made a basic part of the main experiment. Sportsmen were distributed on two groups: control and experimental. Control – was trained by the offered programs of P. V. Zhivora at other coach, experimental – according to the experimental program.

The block of the previous training includes the 2nd cycles for 12 weeks. The second cycle, except for the increase in training loads, depending on individual growth rates of physical and functionality of the sportsman repeats the first.

This block of training was directed on mobilization and support of working activity of the morphofunctional system of an organism which was created in the previous cycles of training. Tasks of the increase of aerobic power are solved, the process of morphofunctional specialization becomes more active. All used means of physical preparation (mainly auxiliary and all-physical) have to be guided not by the development of force of muscles, and by an organism operating a mode intensification for the purpose of the increase of local muscular endurance.

Each 12-week cycle includes three stages: 1) 1–6 weeks – work with a large number of repetitions (till 50) and small

Table 1

The annual distribution of class periods in the experimental group (in hours)

Sections of the training program	Stages of training			Total (48 weeks)
	Block of the previous training (24 weeks)	Block of the basic training (16 weeks)	Block of the specialized training (8 weeks)	
Theoretical preparation	4	3	–	7
Psychological preparation	–	2	2	4
General physical preparation	28	18	8	58
Auxiliary physical preparation	34	23	12	71
Special physical preparation: a) exercises of a dynamic character	58	40	20	118
b) exercises of a static character	–	18	12	30
Working off of technique of a fight at a table	30	20	10	60
Tactics of maintaining a duel	–	4	6	10
Practice of refereeing	–	2	2	4
Implementation of test standards	2	2	–	4
In total for a stage:	156	132	64	
In total in a year:				352

encumbrance (to 50% from maximum); 2) 7–8 weeks – all exercises are carried out with the maximum speed (10–15 repetitions); 3) 9–12 weeks – all exercises are carried out with the big encumbrance (to 80–90% from maximum) till 8 repetitions.

The block of the previous training is a block of activation of a quick function of the neuromuscular device, the increase of power of an organism, the improvement of base of sports technique at an optimum speed and power of efforts. At this stage of training of use of the concentrated loadings allows stirring up activity of the quick device, and also vegetative and power systems which increase its function.

The used methods of training are guided not by the development of force of muscles, and by an organism operating a mode intensification for the purpose of the development of local muscular endurance due to the increase of reduced power of both slow, and fast muscular fibers [4]. Thus, the concentrated use of auxiliary and, especially, specialized physical preparation significantly makes active a morphofunctional specialization of an organism to the chosen type of the competitive activity.

The block of the basic training lasts 16 weeks. The training process of this block is aimed at the development of force and power endurance. The training load is focused on the increase of power and capacity of the power providing systems of an organism, the formation of peripheral vascular reactions, the increase of power of buffer systems of cages and blood, the increase of reduced power of muscles. In this cycle it is essentially important to adhere to an optimum ratio of means of the general, auxiliary and special physical preparation. Approximately this ratio has such appearance: GPP – 30±5%, APP – 30±5%, SPP and directly a fight on a table – 40±5%.

During the training it is offered to carry out 3–4 special exercises, in each exercise from 4 till 6 approaches at what 35±5% of special exercises are carried out in the static mode. Between approaches it is necessary to do a break for 1,5–2 minutes. Trainings are carried out three times for a week, the fourth day is intended for active recreation.

The block of the basic training provides the specifically directed increase in power and capacity of the power providing systems of an organism by means of the increasing intensity of training loads. At this stage of the training process a transition of an organism from urgent to long-term adaptation is carried out. This process is promoted by a stress – reaction of an organism to increase of intensity of a performance of exercises. The stressful syndrome in turn intensifies structural transformations in the working muscles. The increase of intensity and power of a performance of auxiliary and competitive exercises is reached on condition of use of repeated, interval and control methods of training. Such orientation of the training process is followed by the increase of power and capacity of anaerobic power sources, reduced power of muscles and oxidizing properties of fast muscular fibers [4].

The block of the specialized training is aimed at the development of explosive force, study of weak corners, change of kind of work. Trainings with static loadings are obligatory for effective classes by arm sport and in a total amount of loadings have to make not less than 20%, that is the part of static exercises has to make 40±5% of the total amount of the special. The duration of this cycle – 8 weeks. Trainings are carried out three times for a week, the fourth day to a macrocycle is devoted to active recreation (cross-country, sports, a steam bath).

In the block of the specialized training the training process is directed on the subsequent increase of a specific quick function, the achievement of high power level and capacity of an energy potential of an organism and its ability, effectively and economically to use these qualities during trainings and competitions.

Training classes are devoted mainly to modeling of competitive conditions, programs, tactical options, number of approaches, rest intervals. It is known that stressful reactions of an organism to loadings which model competitive activity, allow increasing significantly oxidizing properties of muscles (mainly fast muscular fibers) [4]. Thus, the morphofunctional

specialization of an organism is stabilized at a higher level of capacity and profitability of work at this stage of the training process.

Training according to the experimental program of preparation allowed young armsportsmen to come to the new, highest level of functional and physical fitness. So, the data of a functional condition of the cardiorespiratory system of armsportsmen skilled group authentically improved in comparison with indicators of sportsmen of the control group. It is confirmed by HR indicators (in CG – 67,9±1,1 bpm^{-1}, EG – 64,6±1,0 bpm^{-1}, t=2,15; p<0,05); vital index, respectively, 67,4±0,8 $ml \cdot kg^{-1}$ instead of 69,8±0,7 (t=2,18; p<0,05); arterial pressure: systolic pressure – 127,3±1,3 mm of mer. instead of 123,4±1,1 mm of mer. (t=2,23; p<0,05), diastolic pressure – 77,6±1,2 mm of mer. instead of 73,8±1,0 mm of mer. (t=2,45; p<0,05); coefficient of economization of blood circulation – 3297,8±94,1 s.u. instead of 2956,4±90,3 s.u. (t=2,61; p<0,05) (tab. 2).

Table 2

Dynamics of the studied indicators of young armsportsmen during an annual macrocycle of preparation

Indicators	The beginning of the experiment			The end of the experiment		
	CG (n=15)	EG (n=15)	p	CG (n=15)	EG (n=15)	p
Vital index ($ml \cdot kg^{-1}$)	64,7±1,05	65,4±0,96	p>0,05, t=1,79	67,4±0,84	69,8±0,72	p<0,05, t=2,18
HR (bpm^{-1})	69,7±1,43	68,5±1,13	p>0,05, t=0,84	67,9±1,14	64,6±1,03	p<0,05, t=2,15
Systolic pressure (mm of mer.)	129,6±1,54	128,7±1,76	p>0,05, t=1,51	127,3±1,25	123,4±1,13	p<0,05, t=2,23
Diastolic pressure (mm of mer.)	78,3±0,98	79,5±1,14	p>0,05, t=2,05	77,6±1,21	73,8±0,97	p<0,05, t=2,45
Coefficient of economization of blood circulation (s.u.)	3405,8±98,5	3373,3±94,3	p>0,05, t=1,05	3297,8±94,1	2956,4±90,3	p<0,05, t=2,61
Systolic volume of blood (ml)	68,3±2,34	67,9±2,56	p>0,05, t=0,64	69,9±2,12	72,6±1,98	p>0,05, t=,93
Minute volume of blood (ml)	4721,8±89,7	4684,3±94,4	p>0,05, t=0,52	4787,6±99,4	4896,6±89,3	p>0,05, t=1,56

Therefore, the development of the experimental program of preparation of armsportsmen allowed to create rather high level of morphofunctional basis of the increase and the intensification of the subsequent training loads in the block of specialized preparation at sportsmen of the experimental group on the basis of the block system of training with installation on concentration of loadings of auxiliary (semispecial) and special physical preparation during rather big adaptation cycle (24 weeks of the last and 16 weeks of the basic preparation).

Conclusions:

1. The developed experimental program of preparation of armsportsmen of 16-17-years old allowed to create authentically high level of morphofunctional base of sports preparation at sportsmen of the experimental group on the basis of block system of training with an orientation on concentration of loadings of auxiliary and specialized physical preparation during rather big adaptation cycle (24 weeks of the last and 16 weeks of the basic preparation).

2. The experimental program of preparation of armsportsmen of 16-17-years old allowed to increase the functionality of an organism of sportsmen authentically. So, the economic form of warm activity develops firmnessly in the cardiovascular system to what reliable changes of indicators of HR testify (p<0,05; t=2,15), arterial pressure (p<0,01; t=2,54), coefficient of economization of blood circulation (p<0,01; t=3,19) and minute volume of blood (p<0,05; t=2,63). In comparison with data of the control group the indicator of a vital index authentically raised at sportsmen the experimental group (p<0,05; t=2,18).

3. The application of static exercises of local action and dynamic character in such ratio: 12% and 88% in the block of the previous training, 31% and 69% in the block of the basic training and 38% and 62% of the total amount of specialized exercises in the block of the specialized training rather effectively promote the achievement of high level of sports preparedness.

4. The annual macrocycle of preparation of arm wrestlers of 16-17-years old that includes 3 blocks (1 – the block of the previous training (24 weeks); 2 – the block of basic training (16 weeks); 3 – the block of specialized training (8 weeks)), is rather effective and recommended to preparation practice of armsportsmen.

The subsequent researches will be directed to the area of individualization of training of armsportsmen at the stage of preparation for the highest sporting achievements.

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The monitoring system of a qualitative structure of special physical preparation in cross-country race on motorcycles with a side-car

Abstract. ***Purpose:*** *to develop and to prove methods of an assessment and a control of special physical preparation of motorcycle racers on motorcycles with a side-car.* ***Material and Methods:*** *the analytical synthesis of data of scientific literature, the construction and the use of special semantic spaces, the processing of video filming, the biomechanical analysis of the motive activity.* ***Results:*** *the analysis of the main difficulties is carried out which are arising in the achievement of good results of motorcycle racers on motorcycles with a side-car. Methods of an assessment of each of the making components of the system "a sportsman – a motorcycle – an environment" are defined, components of special physical preparedness which weren't lit in special literature earlier are established.* ***Conclusions:*** *methods of a quantitative assessment of qualitative characteristics of special physical preparedness are stated which can be used in all sports.*

Keywords: *motorcycle races, special physical preparedness, methods of an assessment of physical preparedness, universality of preparedness.*

Introduction. The characteristic feature of technical sports is their applied predestination directed on training of highly skilled professionals in the corresponding kinds of activity. Not less a significant factor of these sports is a test of the used technique, and the continuous improvement of its technique with an operation condition in the raised modes of loading [1]. The role of a human factor in systems "a person – a car – an environment" is especially accurately opened along with the solution of these tasks in them. The improvement of the used technique increasingly opens weaknesses of such link of the system "a person – a car – an environment " which a person is [2].

It attracts ergonomic adaptations of the operated technical means taking into account individual characteristics of a person for convenience of a work with them in extreme and special conditions of their operation. On the other hand, the problem of preliminary professional selection of sportsmen is more and more sharply put who are capable to provide the effective management of a technical object [3].

One of the most available to researches and covering all questions, problems of interaction of components of the system "a person – a car – an environment" is cross-country race on motorcycles with a sidecar. All sharply standing questions of a problem of interaction of a person with a person in the structure of formation of a crew; the importance of coherence of their actions in driving and measures of unambiguity of an assessment of conditions of the competitive environment; and also the share importance of physical, mental fitness of sportsmen in the achievement of joint success in receiving the end result are concentrated in this type of cross-country race [4]. The evidence of not resolved questions which limit possibilities of success of the competitive activity of sportsmen causes the need of the development of the general approaches of creation of theoretical and methodical ensuring of quality standard of characteristics of physical fitness of the qualified sportsmen for technical and applied sports that it is possible to carry out on the basis of motocross-riders on motorcycles with a sidecar. To number of such general questions, characteristic for all technical and applied sports, belong: a maintenance of structure and share ratio of special and general physical fitness of a crew; an assessment of an admissibility of complexity of the overcome routes; an assessment of complexity of overcoming of each element of the route; an assessment of the category of complexity of obstacles in the route and the category of qualification of a sportsman; an assessment of universality of training of a sportsman.

Communication of the research with scientific programs, plans, subjects. The conducted researches are executed according to the plan of the research work in the sphere of physical culture and sport on a subject 2.1.125 "The improvement of sports training of sportsmen-pilots in motoring (number of state registration is 0106UIII990).

The objective of the research: the development and justification of methods of an assessment and control of special physical fitness of sportsmen in cross-country race on motorcycles with a sidecar taking into account their specific features.

Materials and methods of the research: the analytical synthesis of data of scientific literature; the semantic sign spaces providing qualitative characteristics of the compared objects; video filming; biomechanical analysis of movements.

Results of researches and their discussion. Cross-country race competitions, especially on motorcycles with a sidecar, are the extremely difficult for an assessment of results of a performance. It is connected with that they are carried out on the most various sites of the route, length of a circle, average speed, and arrival duration, on various soil, a relief and with other excellent indicators. It excludes possibility of coordination in cross-country race, comparisons of the absolute temporary measures which are recorded at various competitions. In each concrete competition the absolute time in an assessment of passing of all distance and also its separate sites are used for high-quality representation of the performed competitive task. The possible comparison with the previous competitions can be carried out only in relative sizes that causes the necessity of the translation them in system of relative sizes. Such approach received a wide use at the solution of a question of an assessment of similarity of the compared multi-component objects [5]. It is required the construction the sign semantic spaces with introduction by a uniform measure between its elements and definition of the standard of comparison receiving an assessment of the qualitative structure of the compared objects and the establishment of regularities of changes of the controlled indicators [6]. The transfer to relative units is reached by a submission of the estimated characteristic as a percentage, or in shares of unit, the relative chosen standard. As the standard results of

the leader either model characteristics or the best result of a sportsman relatively to his concrete indicators can act. In all cases the criterion of comparison carries out a role of conditional average and acts as a reference mark. [7]. Y. I. Trofimets developed the deepest and substantial monitoring system and estimates of comparative characteristics for the analysis of results in cross-country race [8]. Its system of an assessment of results in cross-country race as indicator of the level of preparedness of a sportsman was used in the conducted researches with more expanded interpretation of its application in practice.

The following indicators acted as such criteria of an assessment: "The maximum high-speed indicator" (MS) reflects the level of special preparedness of a sportsman and is determined by a formula:

$$\text{MS}=\frac{absolutely\ the\ best\ result\ (s)}{the\ best\ result\ of\ a\ racer\ (s)}\times 100\%$$

where an absolute value of the best result acts as the standard of comparison and can be the model characteristic, or its function is carried out by the leader's time, or the best indicator of a racer, it is necessary to divide this size into time which is shown by a racer in a concrete arrival. The essential feature of this criterion of an assessment consists that when the best result of passing of a circle of a racer, who plays a standard role, undertakes as comparison absolutely the size of the standard changes from current state of a sportsman, as well as the average speed of passing of a circle. Thus the criterion of an assessment can remain without a change. Only changes of absolute values of the compared sizes tell about the developed exhaustion. If the absolute result of the best passing of a circle in general undertakes as the criterion of comparison, the criterion of comparison in that case used will show an exhaustion measure. In this case the received result (MS) is called the maximum high-speed indicator of this racer.

The MS can be determined by time of the best circle on routes with various covering (firm, sandy, mud, snow and any other). The size of this indicator characterizes high-speed opportunities of a racer. This criterion can be calculated for an assessment of time spent for a certain element of the route. The closer size MS to unit is, the higher the level of preparedness is. At an assessment of the level of special endurance a wide use finds an index of "a speed reserve". In this case it is necessary to take away time of the fastest passing of a circle from the average time of passing of a circle.

$$\frac{t(general)}{n(the\ best)}-t(the\ best)=t(reserve)\,;t(average)-t(the\ best)=t(reserve)\,;t(average)\rangle t(the\ best)$$

The more "reserved speeds", the worse special endurance is developed. The validity of this situation is explained by that endurance is characterized by time of preservation of a performance of work of the set intensity. The well-developed dynamic stereotype of control of the level of a deviation of the internal environment when performing a work of the corresponding intensity allows a sportsman to estimate duration of its course with certain accuracy. The lower accuracy of perception of these changes is; the more differences of mistakes in determination of optimum speed are that increases the average time of passing of a circle.

The special endurance (SE) is estimated as a percentage that allows establishing a limit of its achievement by the specific individual or level of its learning ability in feeling of the state and possibility of calculation of these. For this purpose the use a deviation of time of the «best» circle (TBC) by the time of an «average» circles (TAC). In this case the indicator of special endurance will be defined by a formula:

$$SE=\frac{TBC}{TAC}\times 100\%\ .$$

According to the semantic contents and final expression indicators of "maximum speed" and "special endurance" are identical that is explained by the physiological mechanism defining their manifestation. Thus, indexes as MS, and by SE can be used not only for the assessment of total productivity of training of a sportsman, but also for the establishment of qualitative structure of this indicator. These criteria are determined by time spent for overcoming of an element of the route; on various coverings of the route that allows estimating a measure of complication of the brought factor; for calculation and comparison of the results reached by the racer in exercises: "an exit from a turn (T) – dispersal (D) – braking (B) – an entrance to a turn (T)" (TDBT). To define the maximum high-speed indicator of TDBT, for this purpose the chosen criterion of comparison (the model characteristic of TDBT) shares for time received by a racer. The indicator (MS) calculated thus taking into account the time (TDBT) characterizes high-speed opportunities of a racer and can be used in a formula of the determination of special preparedness.

In this case $\text{MS}=\frac{\text{mod}\,elcharacteristics\ of\ TDBT}{time\ of\ TDBT\ of\ a\ racer}\times 100\%\ .$

It is absolutely similarly possible to define the qualitative structure of special preparation for definition of the steepness of roughness of the route, springboards, a relief and other factors and, in particular, change of the motorcycle, the workmate (passenger). Such specification of the analysis of obstacles in the route can be brought to a separate element. In this case time of passing of separate typical sections of the route, turns of various radiuses, overcoming of ledges and ledges, waves, long starting dispersal are controlled. Than fuller the structure of private indicators (MS), the more especially the exact passport of individual preparation can be made for a specifically taken sportsman. All metric data can be obtained and stored in high-speed video of competitions or training process when passing the route.

The calculation of SE gives the chance to construct the rational duration of training run taking into account the current state of the racer at the considered preparation stage. An essential indicator of rational duration of training run is the border, at which SE=96%.

Special preparedness SP of the racer can be presented by the integrated indicator consisting of any number of

the compound components reflecting special preparation. However such compound find application in practice, as: an indicator of the maximum high-speed (MS) and an indicator of the special endurance (SE) In this case SP will be presented as SP=MS+SE,

$$SP = \frac{absolutely\ special\ time\ of\ a\ cirle}{the\ best\ time\ of\ a\ racer} \times 100\% + \frac{absolutely\ the\ best\ time\ of\ circle\ of\ a\ racer}{time\ of\ an\ average\ circle\ of\ a\ racer} \times 100\%$$

As each of fractions aspires to 100 in its limit, the sum of SP will aspire to 200. For reduction of all coefficients to the uniform size it is expedient to enter the coefficient before SP, the return to a number of the used composed, and then SP will have the limit either 1, or 100.

The example of creation of a settlement index of SP is carried out as follows: absolutely the best time of a circle in controlled arrival at the racer 170 s, the best time of a circle 175 s, the average time of a circle is 179 s:

$$SP = \frac{170}{175} \times 100 + \frac{175}{179} \times 100 = 97{,}1 + 97{,}7 = 194{,}8$$

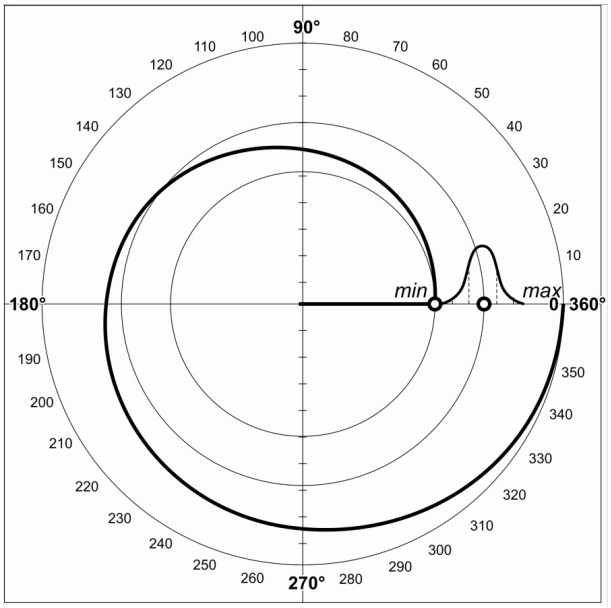
The universality of preparation. That the route of cross-country has rather wide heterogeneity on a relief, soil, quantity of the obstacles complicating its passing, their share ratio in the complete structure of a passable distance, the important indicator of success of performances is such indicator as universality of preparedness. The coefficient of universality of a racer is used for its assessment (U) which pays off as the relation of indicators of special preparedness on this route to SP which is shown on the firm route.

$$U = \frac{SP\ of\ the\ sandy\ route}{SP\ of\ the\ firm\ route} = U_{n} \cdot on \cdot a \cdot covering.$$

The comparison of an indicator on a relief of the crossed firm route with an indicator (SP) on the uniform route is carried out for an assessment of the universality on a relief:

$$U = \frac{SP\ of\ the\ sandy\ route}{SP\ of\ the\ plain\ route} = U_{n} \cdot on \cdot a \cdot relief.$$

The universality of preparation assumes its many-components which cover a high class of driving of the motorcycle on the sandy, crossed and other types of coverings, and also a number of other components entering an arsenal of special physical training of a racer. For representation of such structure of results of many-sided preparation it is necessary to use the uniform standard (SP) of comparison concerning which it is estimated all other components (SP) of preparedness. Or the best of the existing results acting is got out as the model characteristic and size of comparison for each component making universal preparedness. In this case the criteria of comparison carry out a role of unit entered as the standard of measurement. For what circular petal charts with modification of representation of the received results of an assessment in sequence of their uniform distribution are used that is represented as follows on the distributive chart [10] (pic.).



Pic. The distributive diagram

It is possible to present any number of the components entering an arsenal of special physical preparation in the distributive diagram. The basis of its construction and the subsequent use consist that commensurability of a variation of the components defining the structure of creation of special physical preparation and a measure of its universality as on qualitative structure, and quantitative expression of each component leaving is established in it. If all components master on the absolute values of the standard, they are distributed on border of a big circle. In the return case if all of them reach a maximum permissible trifle of expressiveness, all of them settle down on an internal circle. In a beam of average

expressiveness of their absolute values they settle down on an internal circle. The distance from an internal to external circle defines a measure of individual share of a component of special preparedness in the structure of universal preparedness.

In all other cases force of expressiveness of a component in providing the end result in the structure of universal preparedness can vary ranging from the minimum to the maximum expressiveness. Their rank sequence in high-quality expression of the structure of universal preparedness will be defined by a logarithmic spiral which begins from the smallest value of a variation number of components of the structure of universal preparedness to the greatest value of its components. Any petal diagram can be presented in the form of the distributive diagram that allows receiving the additional information which isn't revealed in the usual petal diagram.

The assessment of competitive reliability as an indicator of success of performances is based on the theory of reliability developed in engineering psychology [11]. The assessment of reliability characterizes stability of manifestation of result at the realization of the existing level of preparedness (SP).

The reliability coefficient (Re) is calculated on a formula

$$\mathrm{Re} = \frac{SPc}{SPt},$$

where SPc – a manifestation of special preparedness at competitions; SPt – a manifestation of special preparedness in conditions of the training process.

The more this coefficient to unit is, the higher competitive activity of a racer is. The assessment of reliability of the competitive activity of a motocross-rider reflects, in how much the result of competition decreases rather potential opportunities of a sportsman.

The coefficient of reliability allows controlling an action of a factor of the importance of the level of competitive process and the arising responsibility for the achievement of success in it. The use of coefficient of reliability allows entering an objective measure of special conditions in which the activity of a sportsman proceeds and the level of conscious responsibility is defined for the achievement of success.

The use of coefficient of reliability allows constructing the space displaying the structure of complexity of the competitive activity and to enter a measure of its admissibility for sportsmen that enters an objective assessment of the level of sports qualification [12].

It is necessary to know an indicator of profitability (P) which practically reflects the intensity of work in arrival for the characteristic of individual opportunities in ensuring success. The profitability of specific work determines the level of special endurance. It is established on the level of energy consumption when performing a standard test (loading). In practice of sport a wide use was found by indirect indicators. An intensity assessment, on heart rate during the standard work is the most widespread among them. The less heart rate in the course of passing of arrival and during restoration, the higher profitability of work of a sportsman is. Anyway it is necessary to know the volume of the performed work, time for which it is executed, and the corresponding characteristic of heart rate. The profitability is expressed in cross-country race by the relation of the shown result (SP) to the heart rate (HR). These relations are called an indicator of profitability (P):

$$P = \frac{SP}{HR}.$$

In a profitability indicator actually the numerator has the relative characteristic which isn't exceeding the size of 200% or in transfer to units 2, and a denominator is given in heart rate in a minute that is the dimensional characteristic reflecting average heart rate. Practically the indicator of profitability reflects what measure of intensity of the work of an organism expressed in a private indicator of work of heart reaches a performance (SP). In this case it is necessary to express average heart rate, characteristic for passing of a distance in dimensionless sizes of rather potential opportunities of an organism of a sportsman.

The relative intensity of physiological loading on HR is determined by a formula:

$$I_{HR} = \frac{HRloading - HRrest}{HR\max. - HRrest} \times 100\%$$

In such case $P = \frac{SP}{Ihr}$.

This indicator fully answers the creation of dimensionless criteria of comparison which have an individual focus of an assessment of opportunities of a sportsman, and at consecutive accumulation of statistical material allow optimizing the organization of the training process with the establishment of the forecast about the level of its learning ability.

Conclusions. The received criteria of an assessment of the qualitative structure of special and general physical fitness of sportsmen-motorcycle racers on motorcycles with a sidecar allow carrying out the comparative analysis with the establishment of level of manifestation of certain parties of physical fitness and objectively to establish the level of qualification opportunities of a sportsman, and also universality of his preparedness.

The weakest and strong link in preparedness; either limitation or congenital predisposition in possibility of its development that provides the purposeful professional selection and the organization of special physical preparedness allows defining the established measures of manifestation of qualitative characteristics of special physical fitness.

The presented control methods of qualitative characteristics of activity of a sportsman in the system "a person – an object of management – an environment" allow establishing limit complexity of functioning of this system with the determination of a share value in this restriction of each of its compound components that is a basis of the improvement of the complete system and allows establishing in it limit opportunities of a person, as the limiting factor of the complete

functioning of the system "a person – an object of management – an environment".

Prospects of further researches. The stated methods of a quantitative assessment of qualitative characteristics of the special physical preparedness, which is represented in dimensionless sign semantic spaces, are applicable in all types of sports activity that opens new opportunities in the conducted researches.

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Features Power ectomorphs athletes are engaged in bodybuilding in transition training

Abstract. ***Purpose:*** *to develop and study the diet of athletes engaged in bodybuilding ectomorphs in transition training considering the restoration of lean body mass and functional state of an athlete* ***Material and Methods:*** *the study involved 18 athletes engaged in bodybuilding ectomorphs included in the national team in the Kharkiv region bodybuilding. Methods were used: the theoretical method and summarize the literature, pedagogical supervision, pedagogical experiment, methods of mathematical statistics.* ***Results:*** *comparative characteristics of the diet have been developed for athletes ectomorphs engaged on bodybuilding to increase muscle weight. It was divided the athletes into two experimental groups: the first EG used a balanced diet that made protein 2 grams per 1 kilogram of body weight and carbohydrates 4–5 g·kg^{-1} in the second EG was protein 3 grams per 1 kilogram of body weight, and carbohydrate 6 grams kg. Second EG diet consists of 6 single meal and is about 2800–3500 calories per day.* ***Conclusions:*** *on the basis of research by the author offered the optimal diet for athletes ektomorfiv second experimental group engaged in bodybuilding.*
Keywords: *features of the diet, athletes ectomorphs, training process, transition, optimal diet microcycle.*

Introduction. For this time in Ukraine the popularity of bodybuilding among different stratums of the population, and first of all among youth grows that is caused by availability of classes and their efficiency in the development of the main physical qualities.

Specifics of bodybuilding consists in that meal has a prime value in this sport, not in view of different type of a constitution as a factor which provides an optimum muscle gain and power indicators [1–5; 8; 9].

Many scientists devoted their researches to a question of interrelation between different somatic types and sports abilities (O. O. Borysova, V. A. Druz, V. M. Platonov, D. Weider) [1; 6; 10; 12; 13]. It is established that representatives of different types of a constitution have unequal opportunities in the development of physical qualities. Outstanding achievements in certain sports usually coincide with concrete morphological features.

As for bodybuilders, anthropometrical indicators not only of different kind are considered, but additional coordinates are entered, in particular, a rate of individual development undertakes to attention at reference of a sportsmen to this or that type of a constitution. In many cases such signs as weight and length of a body, a circumference of a thorax, longitudinal and circle sizes of the lower and top extremities (a hip, a shin, a shoulder, and so forth), trunks are considered when determining a constitution of a body of a sportsman.

A constitution of a body is one of the main features of physical development. According to researches of the leading scientists of the sports branch (V. A. Druz; V. M. Platonov; D. Weider) [6; 7; 10; 12], representatives of different somatic types have different abilities that is important at a choice of sports specialization. At the same time it is possible to use features of a constitution as advantage at the correct approach in the training process. Relying on a practical experience and generalizing data of special literature, it is possible to allocate such types of a constitution of a body:

A sportsman of *endomorphic* (*hypersthenic*) type differs in a dense structure of a body, short extremities and wide bones. Endomorphs have a big tendency to accumulation of excess fatty deposits therefore they should approaching questions of food especially attentively. Despite of it, endomorphs have high power endurance and renew quickly after loadings.

A sportsman of *mezomorphic* (*normosthenic*) type of a constitution differs in a wide skeleton, and a shape of a torso reminds a turned triangle. Sportsmen who treat it like a constitution, gain weight much quicker, than ectomorphs. It is safely possible to call them born sportsmen because there are all prerequisites to the development of muscles. Such sportsmen differ in power and aerobic endurance and perfectly renew after long loadings. This type perfectly proves almost in all sports, and especially in bodybuilding.

A sportsman of *ectomorphic* (*asthenic*) type has more developed abilities to speed and dexterity. He is still called slowly growing. At sportsmen who treat this type, bones are thin, a body is thin, extremities are long, and a torso is short. The process of metabolism at them is very fast therefore it is rather difficult to them to gain weight. They have a beautiful reaction and they are very vigorous, but as for power endurance, it very small. So, the process of renewal after long loading goes slowly, though aerobic endurance is rather high at such sportsmen.

Receiving high sports results in many respects depends on the existence of the individualized system of preparation which has to be based on an optimum creation of the training process of sportsmen of different types of a constitution who are engaged in bodybuilding. [10–12].

However still there are no evidence-based techniques of meal for sportsmen-ectomorphs in native sport who are engaged in bodybuilding in the transition period of preparation. Therefore trainers and sportsmen should gather a practical experience by trials and errors. The increased requirement of bodybuilders needs studying of condition of a problem and development of the effective principles of a diet in an evidence-based technique of meal in the transition period of preparation [14–17]. Therefore the author developed two variants of meal for sportsmen-ectomorphs and reasonably efficiency of food in the transition period of preparation.

In bodybuilding the transition period of preparation lasts 4 weeks, that is four restoration microcycles. During this period bodybuilders of different types of a constitution renew a body weight and try to fulfill a technique of training exercises maximum as much as possible. At the end of each microcycle the condition of the sportsman is estimated by the trainer, and amendments are introduced in the plan of meal [8–11].

Communication of the research with scientific programs, plans, subjects. The scientific research is executed by a subject of the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 by a subject 3.7 "Methodological and organizationally-methodical bases of definition of individual norm of a physical condition of a person" (number of the state registration is 0111U000192).

The objective of the research: to prove a allowance of meal of sportsmen-ectomorphs who are engaged in bodybuilding in the transition period of preparation taking into account a renewal of a muscular body weight and a functional condition of a sportsman.

Material and methods of the research. In the research the following methods were used: theoretical method and generalization of literature, pedagogical supervision, pedagogical experiment, method of mathematical statistics.

Members of a national team of the Kharkov area and Ukraine took part in this research. Before the experiment 18 qualified bodybuilders with a constitution type ectomorph were attracted from whom 4 CMS, 14 – the I category at the age of 20–26 years old. Participants were distributed by a sports qualification on two experimental groups. Participants of the experiment trained 4 times for a week and ate 5–6 times per day.

Results of the research and their discussion. At the beginning of the experiment we conducted the research concerning the analysis like a constitution for the qualified sportsmen who specialize in bodybuilding. Among sports clubs ("Feromon", "Tetra", "Chornyi Bizon", "Forma", CYSS No. 9 in Kharkov), and also between students of Kharkov state academy of physical culture of the specialization weightlifting, we selected 30 qualified sportsmen from 20 till 26 years old (CMS and the I category) who specialize in bodybuilding and agreed to take part in the research. All selected qualified bodybuilders had the average height 170,9, the minimum and maximum indicators of growth made 160 and 181 sm at sportsmen. We chose the index by which, in our opinion, it is possible to define a type of a constitution of qualified bodybuilders most precisely.

The index of Solovyov is a definition like a constitution of sportsmen by a hand grasp (bone thickness). By the criteria of Solovyov a mezomorph (normosthenic) has hand grasp parameters not less than 18 sm and not more than 20 sm, endomorph (hypersthenic) has parameters 20 sm and more and ectomorph (asthenic) – less than 18 sm.

At the beginning of the experiment all sportsmen were divided on different indicators of a constitution. Due to the index of Solovyov we defined that 18 sportsmen – ectomorphs, 2 sportsmen – endomorphs and 10 – sportsmen- mezomorps.

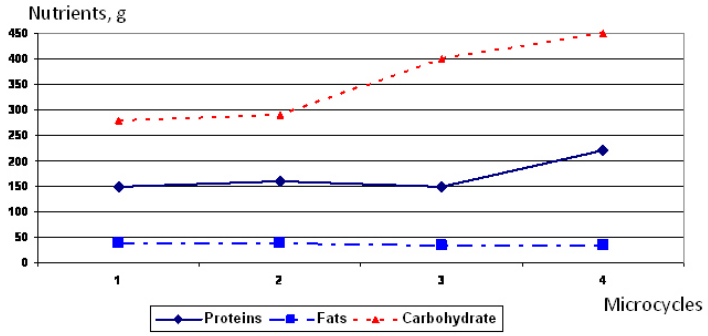
In our opinion, the most problem type of a constitution in classes by bodybuilding – is an ectomorph (pic. 1). Among the qualified bodybuilders which have different types of a constitution, we selected 18 sportsmen - ectomorphs.

Pic. 1. Ectomorphic (asthenic) type of a constitution

Two experimental diets on renewal of a muscular body weight after long loadings was developed.

The use of meal as a compound preparation, caused the application of two options of a diet which differed in a ratio of the main nutrients (proteins, fats and carbohydrates). The assessment is carried out by means of diaries of meal in which the quantity and types of foodstuff were specified which were used during a day. Contents of the main nutrients decided on the help of reference tables of a chemical composition of foodstuff.

We will consider the first scheme for sportsmen - ectomorphs of the first experimental group who are engaged in bodybuilding, pic. 2.



Pic. 2. Dynamics of the main nutrients of a diet of sportsmen - ectomorphs of the first experimental group in the transition period who are engaged in bodybuilding

During the first microcycle the first experimental group of sportsmen used 1,5–1,7 g of proteins per 1 kilogram of a body weight and 3–4 g of carbohydrates per 1 kilogram of a body weight. In the second the amount of proteins and carbohydrates grew on 10 grams, in the third microcycle the amount of proteins reduced on 10 grams, and carbohydrates increased on 100 g and at the beginning of the fourth microcycle made –2,5 grams of proteins per 1 kilogram of a body weight and carbohydrates of 4-5 $g \cdot kg^{-1}$. So, it isn't necessary to forget that the day norm of water makes 3 liters for a bodybuilder of an ectomorphic type of a constitution.

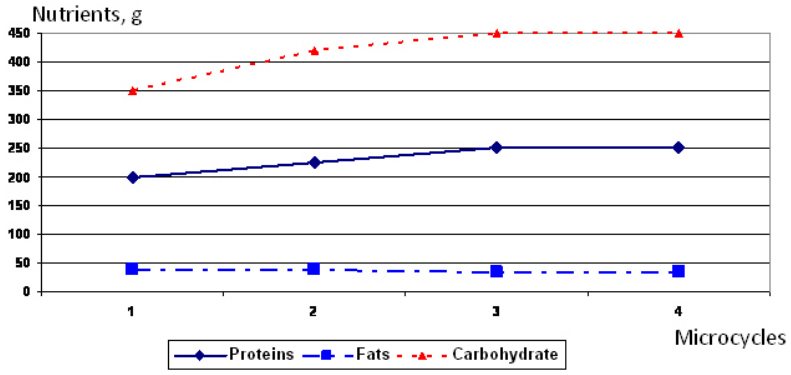
The approximate list of products which was used during a day, and its caloric content in the first experimental group.

Averages results are taken:

1. First meal:
– 2 eggs;
– 100 g of meat, poultry meat or fish;
– 200 g (1 glass) of milk, kefir or low-fat yogurt;
– 1 piece of black bread (this is all is about 50 g of protein).
2. Second meal:
– A plate of porridge (100 g) (not instant);
– 200 g of milk, kefir, low-fat yogurt or juice (15–20 g of protein).
3. Third meal:
– A plate of soup;
– 100 g of meat, poultry meat or fishes;
– 1–2 pieces of black bread (42–45 g of protein).
4. Fourth meal:
– 100–150 g of cheese;
– 1–2 tablespoons of honey;
– 1 piece of black bread (20 g of protein);
5. Fifth meal:
– 100 g of muesli with milk (15 g of protein).

At such frequent use of meal and high dispensing of protein for normal functioning of a digestive tract it is recommended to include products which contain cellulose in a diet. Salad with raw vegetables (cabbage, beet and so forth) are the most suitable for bodybuilders.

To shortcomings of this diet it is possible to carry low contents of carbohydrates because ectomorphs by their structure of body have no a rather big body weight (fatty). Therefore, in our opinion, the amount of carbohydrates per 1 kilogram of a body weight should be raised. Sportsmen of the second experimental group ate at the following scheme (pic. 3).



Pic. 3. Dynamics of the main nutrients of a diet of sportsmen-ectomorphs of the second experimental group in the transition period who are engaged in bodybuilding

Unlike the first technique which has (more balanced meal) that sportsmen of the first experimental group use, the technique of the second experimental group was more expressed in the high use of carbohydrates for the increase in body weight of sportsmen-ectomorphs.

Throughout the first microcycle the second experimental group of sportsmen used 2,3 g of proteins per 1 kilogram of a body weight and 4 g of carbohydrates per 1 kilogram of a body weight. In the second – the amount of protein of 3 g and carbohydrates grew till 5 g per 1 kilogram, the amount of proteins grows in the third microcycle till 3,5 g, and carbohydrates increased till 6 g per 1 kilogram of a body weight and during the fourth microcycle made – proteins of 3 g per 1 kg of a body weight and carbohydrates of 6 g per 1 kg. So, it isn't necessary to forget that the day norm of water makes 3–4 liters for a bodybuilder of an ectomorphic type of a constitution.

If a weight is about 80-90 kg, this program of meal will suit. The diet consists from 6-times of meal and makes about 2800-3500 calories per day.

The approximate list of products which was used during a day, and its caloric content in the second experimental group.

Average results are taken:

1. First meal:
– Oat flakes 100 g (dry weight);
– Milk of 0,5% 250 ml;

– Raisin 50 g;
– Olive oil 5 g
2. Second meal:
– Chicken breasts (fillet) 250 g;
– Buckwheat 150 g (dry weight);
– Olive oil 15 ml.
3. Third meal:
– Macaroni 150 g (dry weight);
– Chicken breasts (fillet) 200 g;
– Chicken egg-white – 10 pieces
4. Fourth meal:
– Geyner 50 g (powder) divorced with water.
5. Fifth meal:
– Rice – 70 g (dry weight);
– Chicken breasts (fillet) – 100 g
6. Sixth meal:
– Cottage cheese (cottage cheese) – 130 g;
– Olive oil – 10 g.

A day meal – 2800 kkal, but the feature like a constitution of ectomorph predetermines an addition of kkal depending on an individual type of ectomorph, so a day norm of kkal (carbohydrates) can make till 3500 kkal.

Before the experiment the test weighing of both groups was carried out, and also anthropometrical intentions by means of which we could find the best result in a gain of indicators. The devices a skin scales and a centimetric tape were used for carrying out the weighing (tab. 1, 2)

Table 1

Average indicators of anthropometrical data of sportsmen-ectomorphs of both experimental groups at the beginning of the transition period who are engaged in bodybuilding, (n1=n2=9)

Indicators	EG № 1		EG № 2		t	P
	$\bar{X}_1 \pm m_1$	V, %	$\bar{X}_2 \pm m_2$	V, %		
Body weight, kg	82,50±4,05	14,72	89,00±3,98	13,41	0,94	>0,05
Circumstance of a neck, sm	41,28±1,35	9,79	40,78±1,28	9,44	0,22	>0,05
Circumstance of a breast (breath), sm	111,88±2,00	5,36	115,38±2,70	7,01	0,85	>0,05
Circumstance of a breast (exhalation), sm	103,33±2,07	6,02	104,72±2,27	6,50	0,37	>0,05
Circumstance of a biceps, sm	42,00±1,87	13,32	42,62±1,75	12,30	0,20	>0,05
Circumstance of a waist, sm	77,28±2,28	8,84	79,28±2,42	9,15	0,49	>0,05
Circumstance of a hip, sm	77,38±1,82	7,04	77,22±1,88	7,32	0,05	>0,05
Circumstance of a shin, sm	39,45±1,32	10,03	39,62±1,24	9,41	0,08	>0,05
Circumstance of a forearm, sm	37,00±1,35	10,91	38,42±1,67	13,03	0,54	>0,05

The divergences were doubtful at the beginning of the transition period of preparation of the qualified bodybuilders: in a body weight (№ 1 EG – 82,50 kg, № 2 EG – 89,00 kg; P<0,05); a hip circumstance (respectively – 77,38 sm, 77,22 sm; P<0,05); a waist circumstance (respectively – 77,28 sm, 79,28 sm; P<0,05); a neck circumstance (respectively – 41,28 sm, 40,78 sm; P<0,05); a breast circumstance on a breath (respectively – 111,88 sm, 115,38 sm; P<0,05) and on an exhalation (respectively – 103,33 sm, 104,72 sm; P<0,05) and a shin circumstance (respectively– 39,45 sm, 39,62 sm; P<0,05).

Coefficients of variation of all main anthropometrical indicators practically didn't exceed the general initial level separately for the first experimental and second experimental groups. For example, it madeV=14,72 % for the second experimental, V=13,41 % for the mass of the first experimental group.

So, at the end of the transition period body weight at sportsmen-ectomorphs who are engaged in bodybuilding, is (№ 1 EG – 11,67 kg, № 2 EG – 5,33 kg; (t=4,87; P<0,01), a waist circumstance (№ 1 EG – 5,17 sm, № 2 EG – 2,00 sm; (t=7,89; P<0,01), it increased more in EG № 1, and a circumstance of two-headed muscle of a shoulder (biceps) (№ 1 EG – 2,33 sm, № 2 EG – 3,17 sm; (t=7,15; P <0,01), a shin circumstance (№ 1 EG – 1,00 sm, № 2 EG – 2,50 sm; (t=6,70; P <0,01), a breast circumstance on a breath (№ 1 EG – 2,00 sm, № 2 EG – 3,00 sm; (t=1,53; P<0,05) – in № 2 EG.

The divergences in a gain of other indicators are doubtful (P>0,05).

Conclusions. Thus, two meal allowances were developed for sportsmen-ectomorphs who are engaged in bodybuilding.

Table 2

Indicators of a gain of average anthropometrical data of sportsmen - ectomorphs of both experimental groups at the end of the transition period who are engaged in bodybuilding, (n1=n2=9)

Indicators	EG № 1	EG № 2	t	P
	$\bar{X}_1 \pm m_1$	V, %		
Body weight, kg	11,67±0,96	5,33±0,46	4,87	<0,01
Circumstance of a neck, sm	2,33±0,17	2,50±0,28	2,9	<0,05
Circumstance of a breast (breath), sm	2,00±0,21	3,00±0,21	2,73	<0,05
Circumstance of a breast (exhalation), sm	2,00±0,21	2,83±0,39	1,53	>0,05
Circumstance of a biceps, sm	2,33±0,17	3,17±0,23	7,15	<0,01
Circumstance of a waist, sm	5,17±0,25	2,00±0,21	7,89	<0,01
Circumstance of a hip, sm	3,83±0,33	4,00±0,11	0,39	>0,05
Circumstance of a shin, sm	1,00±0,00	2,50±0,18	6,70	<0,05
Circumstance of a forearm, sm	0,33±0,17	1,00±0,30	1,58	>0,05

The feature of a diet in the first EG consisted in the allowanced balanced meal. However the first EG of sportsmen didn't receive desirable results concerning the increase in a muscular body weight.

The second EG used more frequent and high-calorie meal which included 3–4 grams of proteins per kilogram of a body weight and 5–6 grams of carbohydrates per 1 kg of a body weight. Such meal promoted more a performance of the put task – to the increase in muscular body weight for sportsmen-ectomorphs that was proved authentically, the second experimental group showed a bigger gain in a body weight ($t=4,87$; $P<0,001$), a neck circumstance ($t=2,90$; $P<0,05$), a breast circumstance on a breath ($t=2,73$; $P<0,05$), a biceps circumstance ($t=7,15$; $P<0,001$), a waist circumstance ($t=7,89$; $P<0,001$) and a shin circumstance ($t=6,70$; $P<0,001$), than the first experimental group did.

The developed techniques for sportsmen-ectomorphs can be estimated as optimum in preparation for the accumulation of a muscular body weight in the transition period of preparation.

The feature of techniques of meal for sportsmen-ectomorphs who are engaged in bodybuilding, can be recommended for preparation, for observance of requirements of sports and medical control, for ensuring effective and high-quality renewal in the transition period of preparation.

The subsequent researches have to contain the development and justification of a technique of meal for sportsmen-endomorphs who are engaged in bodybuilding in the transition period of preparation.

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Ways to improve the technical and tactical skills wrestlers Greco-Roman style of different manners of conducting a duel

Abstract. ***Purpose:*** *develop and validate complex training tasks to improve the technical and tactical skills wrestlers Greco-Roman style of different manners of conducting fight.* ***Material and Methods:*** *identified current problems of the individualization of training in wrestling based on the analysis of scientific and methodological literature, modern competitive activity and synthesis of best practices.* ***Results:*** *the analysis of 75 highly skilled labor Greco-Roman style. The features of the technical and tactical skill of wrestlers of different manners of conducting fight and develop a set of tasks for each typical style confrontation.* ***Conclusions:*** *it found that in the preparation of the wrestlers need to take into account the style of fight each athlete.*
Keywords: *competitive activity, technical and tactical skills, job training, style of fight, Greco-Roman wrestling.*

Introduction. The current trend of an intensification of the training process in wrestling, except the general increase in the competition in sport, is connected with an aspiration of the international federation of fight to increase staginess of wrestling dual meets. The duration of competitive fights and the duration of tournaments are reduced for this purpose, and the practician of refereeing is oriented on stimulation of the activity of fighters together with the increase in quantity of techniques [1; 8; 13; 16]. The level of technical and tactical actions (TTA) of a sportsman mainly defines his success in a dual meet [4; 7; 9]. The scientific and methodical ensuring of training of the qualified fighters demands first of all a choice of the most effective TTA and their further improvement. It is caused by that the composition and structure of productive TTA quickly changes in sports practice. Therefore it is important to inform in due time fighters and coaches on the perspective directions of the development of a fight for training of high-class sportsmen. Thus the analysis of competitive actions of the leading fighters of the present is actual [7; 8; 15; 19]. Besides, the problem of individualization of preparation always remained the actual direction of researches [2; 3; 5]. In Greco-Roman wrestling the problem of an individualization has a special value, the high sports result can be reached in various ways of maintaining a dual meet.

Communication of the research with scientific programs, plans, subjects. The work is performed according to the plan of the RW of Kharkov state academy of physical culture.

The objective of the research: to develop and to prove complexes of training tasks for the improvement of technical and tactical skill of fighters of the Greek-Roman style of various manners of maintaining a dual meet.

The tasks of the research:

– to define a current state of a problem of preparation in wrestling on the basis of the analysis of scientific and methodical literature, modern competitive activity and synthesis of the best practical practices;

– to establish features of technical and tactical skill of fighters of various manners of maintaining a fight and to develop complexes of tasks for each standard style of an antagonism.

Material and methods of the research: analysis of scientific and methodical literature, pedagogical supervision, analysis of video records of competitive activity of fighters, timekeeping.

Results of the research and their discussion. Experts of wrestling mark out three main styles of maintaining a dual meet: game, power and tempo [3; 6; 10].

The style of a fighter is formed resistant and reliable if not only requirements of competitive activity, and and the general tendencies of development of Greco-Roman wrestling as sport were considered in the course of his formation. So, it is necessary to consider the emergence of new effective techniques of preparation and the development of motive qualities, new technical and tactical actions [11; 12; 14; 18].

We made pedagogical observations over the competitive activity of sportsmen- fighters of high qualification. Greco-Roman wrestling competitions were an object of supervision: The European Championship (EC) 2014, the World Cup (WC) 2014, the Final of Golden Grand Prix (GP) 2014 and large international tournaments 2014. 75 fights of fighters 2015 (on 25 dual meet of each style) were analysed.

The analysis of a technical arsenal of the modern competitive activity of highly skilled fighters allowed to allocate 10 main technical actions which are most often used: fall overs by a backfin, throws by a back belt, fall overs and throws by a return belt, counterreceptions on the pit, transfers, throws by a spaning, dumping, pushing out of a mat, counterreceptions in a stand.

It is established that fall overs by a backfin, and in a stand – transfers are the most carried out by TTA on the pit for all groups of fighters.

Also it was defined that a “game wrestler” generally usees productive (3-points and 5- points) TTA for the achievement of a victory: throws by a back belt, throws by a spaning, and dumping by knocking down. The high percent of a performance of these receptions is explained by that coordination abilities are well developed at fighters of this style. This advantage at a “game wrestler” allowed to carry out more counterreceptions in a stand and on the pit, than “powers” and “tempos”. “Powers” and “tempos” generally carry out simple (1-points and 2-points) TTA for the achievement of a victory: pushing out of a mat, transfers and fall overs by a backfin.

“Game wrestlers” have most of all ahead of schedule won fights – 17 (68%), then at “powers” – 12 (48%) and “tempos” – 11 (44%).

The analysis of tab. 1 allowed to reveal that insignificant distinctions for all styles of an antagonism have efficiency of attack in a stand and on the pit: it fluctuates from 55% at "tempos" to 68% at "powers". The efficiency of defense is the highest at "game wrestlers" (a stand – 85%, pit – 86%). and it made The productivity is also the highest at "game wrestlers" in a stand – 4,33 points on a person, and on the pit – 4,5 points on a person.

It is also necessary to notice that the interval of attack and an interval of successful attack at "game wrestlers" and "powers" is higher in the first period, than in the second, and at "tempos" – in the second period is better, than in the first.

At "game wrestlers" the average time of a fight made 216 s (slightly more than one period), and at "powers" – 289 s and "tempos" – 287 s (almost full two periods).

Table 1

Technical and tactical indicators of fighters of the Greek-Roman style of various manners of maintaining a dual meet

Style of maintaining of a dual meet / Indicators	"Game wrestlers»	"Tempos»	"Powers»
Efficiency of attack in a stand (%)	65	55	61
Efficiency of attack on the pit (%)	59	60	68
Efficiency of defense in a stand (%)	85	79	84
Efficiency of defense on the pit (%)	86	71	63
Productivity in a stand (point)	4,33	2,5	3,33
Productivity on the pit (point)	4,5	3,5	3,67
Attack interval in the I period (s)	32	94	43
Attack interval in the II period (sc)	61	59	60
Interval of successful attack in the I period (s)	62	127	84
Interval of successful attack in the II period (s)	108	97	93
Average time of a fight (s)	216	287	289

Most of specialists in the theory and practice of wrestling [6; 10; 17] is considered that it is necessary to observe an individual approach, considering a manner of maintaining a dual meet of each sportsman when training fighters. It allows to optimize the educational-training process and to reach the planned result with the use of strengths of martial artist. Therefore complexes of training tasks according to the main manner of maintaining a dual meet were offered for the improvement of technical and tactical skill of sportsmen on the basis of requirements of the modern competitive activity (tab. 2-4).

Table 2

Training tasks for the improvement of technical and tactical skill of "game wrestlers"

№	Training tasks
1	Conducting a fight against a suppression of the opponent by the technical superiority due to an active hold, good equipment, a wide arsenal of tactical training, a combination of holds, training and crown techniques
2	Use of various tactical training for the creation of dynamic situations for carrying out a techhnique
3	To be able to leave the inconvenient hold imposed by the rival with carrying out the attacking action; maneuvering for the creation of unstable situation at the rival; ability not to recede in a favourite hold
4	Complication or simplification of initial and intermediate mutually provisions of fighters; variation of resistance of the rival (increase or reduction); improvement of skills of optimum relaxation and tension of muscles
5	Development of figurative perception of a dual meet, situational thinking and ability to predict actions of the rival; use more qualified, but the easy partner
6	Deduction of advantage due to maneuvering, threats of sham attacks and demonstration of activity; maneuverings by versatile movement in alternation with an emphasis and sham attacks
7	To be able to use "failures" of the rival on the pit for the purpose of obtaining technical advantage; effectively to conduct a duel with the fighter who went to a deaf defense; ability to carry out techniques with the rival's advancing; artificial masking of the attacking actions; performance of counterreceptions at attack of the opponent on the edge of a mat
8	After a successful attack (counterattack) with a prize of point (points) again to attack, then to be restored, holding advantage maneuvering then still to attack with transfer of the rival to dangerous situation, to pressurize him and to win a victory on hulk or on points.
9	Abilities to carry out productive throws with a high amplitude
10	To be able to finish ahead of schedule fight in connection with a clear advantage on points or on "hulk"
11	To have in the arsenal 10-12 options of attack from 6–7 groups of techniques, both in a stand, and on the pit, average productivity of technical actions for a fight not less than three points

Table 3

Training tasks for the improvement of technical and tactical skill of "tempos"

№	Training tasks
1	Conducting a fight against a suppression of the opponent strong-willed superiority due to pressure prosecution, an aggressive impact, functional pressure; constantly to pursue the opponent with work as hands from below
2	To be able to apply active defense (breakthroughs, shvung, pushes) to the subsequent attacking actions; to use the moment of the end of unsuccessful attack of the rival («failure» on the pit) for a fast counterattack; ability after carrying out attack from a stand at once to carry out fall overs by a backfin
3	Improvement of ways of removal from balance and active holds, rival's hassling; to carry out technical actions against exhaustion
4	To be able to create visibility of an active fight due to prosecution of the rival active actions in a zone of «passivity», repeated attacks at border of the working area of a mat; to create visibility of an active fight in a zone of «passivity», disconnecting hands from below
5	Effective maintaining a dual meet with the fighter who went to a deaf defense; exits from inconvenient holds by pushes, breakthroughs, shvung and emphasis
6	After successful attack (counterattack) with a prize of point (points) not to reduce activity, to put pressure; deduction of advantage at the expense of shvung, pushes
7	Improvement of skills actively to begin a fight from the first minute of a fight
8	To be able to finish ahead of schedule fight in connection with removal of the rival for a passive conducting fight
9	Use of more qualified and heavy partner; reduction of time of rest and increase in intensity of loading (change of partners)
10	To have in the arsenal of 8-10 options of attack from 6–7 groups of techniques, both in a stand, and on the pit, average productivity of technical actions for a fight not less than two points

Table 4

Training tasks for the improvement of technical and tactical skill of "powers"

№	Training tasks
1	Conducting a fight against a suppression of the opponent physical superiority at the expense of the power pressure and high-speed pressure; to use power pressure at a reliable defense (in a «deaf» stand)
2	Variation of resistance of the rival (increase or reduction); use less qualified, but the heavy partner
3	To be able to use efforts of the rival in a zone of "passivity" to develop, pass through it with the subsequent attacking actions
4	Complication or simplification of initial and intermediate mutually provisions of fighters; use of various tactical training for the creation of dynamic situations
5	Improvement of accuracy of a performance of hold; improvement of skills of optimum relaxation and tension of muscles
6	To be able to use efforts and actions of the rival for carrying out counterreceptions and coverings; to carry out pressure in an active «deaf» stand by knitting of hands, forging, shvung, breakthroughs, pushes; ability ahead of schedule to finish a fight in connection with a clear advantage on points or on «hulk»
7	To be able to use efforts and movements of the rival at the region of the working square of a mat for carrying out the counterattacking actions for a mat; to carry out techniques with the rival's advancing
8	After successful attack (counterattack) with a prize of point (points) to hold advantage a reliable defense, forging
9	Improvement of skills of a fight in a dense hold in the conditions of the rigid power pressure and prosecution of the rival on all area of a mat
10	To have in the arsenal of 8-10 options of attack from 6–7 groups of techniques, both in a stand, and on the pit, average productivity of technical actions for a fight not less than three points

And also it is necessary for fighters of each style of an antagonism:

– to be able to make and realize the tactical plan for a fight with any rival;

– to achieve advantage at a biased judging.

– to carry out techniques for a short period (10–15 s) at the end of a dual meet, against an exhaustion at a loss in the account.

Conclusions:

1. The analysis of a technical arsenal of the modern competitive activity of highly skilled fighters allowed to allocate 10 main technical actions which are most often used: fall overs by a backfin, throws by a back belt, fall overs and throws by a return belt, counterreceptions in a stand and on the pit, transfers, throws by a spaning, dumping by knocking down, pushing out for a mat.

2. It is established that fall overs by a backfin, and in a stand – transfers are the most carried out by TTA on the pit for all groups of fighters.

Also it was defined that a "game wrestler" generally use productive (3-points and 5-points) TTA for the achievement of a victory: throws by a back belt, throws by a spaning throws by a spaning and dumping by knocking down.

"Powers" and "tempos" generally carry out simple (1- point and 2- points) TTA for the achievement of a victory: pushing out for a mat, transfers and fall overs by a backfin.

"Game wrestlers" have the most of all ahead of schedule won fights – 17 (68%), then at "powers" – 12 (48%) and

"tempos" – 11 (44%).

It is revealed that insignificant distinctions for all styles of an antagonism have efficiency of attack in a stand and on the pit: it fluctuates from 55% at "tempos" to 68% at "powers". The efficiency of defense is the highest at "game wrestlers" (a stand – 85%, pits – 86%). The productivity at "game wrestlers" is also the highest in a stand – 4,33 points on a person, and on the pit – 4,5 points on a person.

It is also necessary to notice that the interval of attack and the interval of successful attack at "game wrestlers" and "powers" are higher in the first period, than in the second, and at "tempos" – in the second period is better, than in the first.

At "game wrestlers" the average time of a fight made 216 s (slightly more than one period), and at "powers" – 289 s and "tempos" – 287 s (almost full two periods).

3. It is established that it is necessary to consider the style of maintaining a dual meet of each sportsman when training fighters. It allows to optimize the educational-training process and to reach the planned result with the use of strengths of the fighter. Complexes of training tasks according to the main manner of maintaining a dual meet were developed for this purpose.

Further researches will be directed on the detection of features of physical fitness and the development of a complex of training tasks for the development of physical qualities of fighters of the Greek-Roman style of various manners of maintaining a dual meet.

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The improvement of technical skill at the stage of the specialized basic preparation in fitness by means of powerlifting

Abstract. ***Purpose:*** *to develop methodical recommendations of the improvement of technical skill at the stage of the specialized basic preparation in fitness by means of powerlifting.* ***Material and methods:*** *Masters of sports in powerlifting and candidates for the master of sports in powerlifting – members of a national team on weightlifting and powerlifting of the Kharkov area took part in the research. Methods were used: theoretical analysis and generalization, analysis of scientific literature, pedagogical supervision, pedagogical experiment, video registration method, methods of mathematical statistics.* ***Results:*** *we developed a number of methodical recommendations which are submitted on finishing technical skill on the basis of the analysis of technique of a performance of the competitive exercise deadlift which is made by means of the program Dartfish by highly skilled sportsmen. As a result of the experiment it is established that the gain of result was more significant in the experimental group which was engaged by the developed technique.* ***Conclusions:*** *it is experimentally proved that the use of computer programs of video registration allows improving qualitatively the feedback between a coach and a sportsman, optimizing the process of training of a sportsman and correction of his technique, increasing the gain of sports result.*

Keywords: *physical preparation, fitness, video analysis, powerlifting exercises.*

Introduction. Thanks to the growth of popularity of fitness more and more people start being engaged in this sport. The popularity of fitness is explained by simplicity, availability, rapid growth of results and beneficial influence on health.

Classes by fitness promote the increase in muscular force, ligaments and joints fix, rozvit endurance, flexibility and other useful properties help, cultivate will, confidence in the forces, increase operability of the whole organism. All this does the research of the existing means of preparation in fitness actual, and with it there is a question – what technique of trainings is the most effective? The problem of a choice of the correct technique of trainings by sportsmen is connected with a large number of such techniques and their incomplete scientific justification. Therefore the extremely actual is a scientific approach to the solution of this problem.

Powerlifting– is a power sport which essence consists in the overcome scales of the heaviest encumbrance. Powerlifting is also called power triathlon. It is connected by that three exercises enter at it as competitive disciplines: knee-bend with a bar on shoulders, a bar press, lying on a horizontal lava, and draft of a bar – which in the sum also define the qualification of a sportsman. These three exercises are widely applied in fitness as basic to the development of muscles of the whole body. The main feature of a performance of competitive exercises is the dynamic, overcoming operating mode of muscles at slow uniform speed, and movement of a bar has to be carried out without accelerations with a constant speed. These exercises is often used as the indicator of absolute force of a back and feet in quality, and also are applied as the test practically in all sports.

In fitness competitive exercises of powerlifting are used behind the direct appointment – for the development of force, and, above all – for the accumulation of mass of muscles of a body.

A study of technique of competitive exercises of powerlifting is one of the problems of training of sportsmen in fitness. As notes a number of authors

(B. Sheyko [31, p. 330] and F. Hetfild [29, p. 156]), an individualization of a technique of competitive exercises causes special difficulties in coaches, thus anatomic and physiologic features of sportsmen are poorly considered. All this constrains the progress of sportsmen. There is a contradiction between need of an individualization of a technique of execution of exercise by a sportsman and insufficient its preparedness in the theory and in practice.

The objective of the research: to develop methodical recommendations of the improvement of technical skill at a stage of the specialized basic preparation in fitness by means of powerlifting.

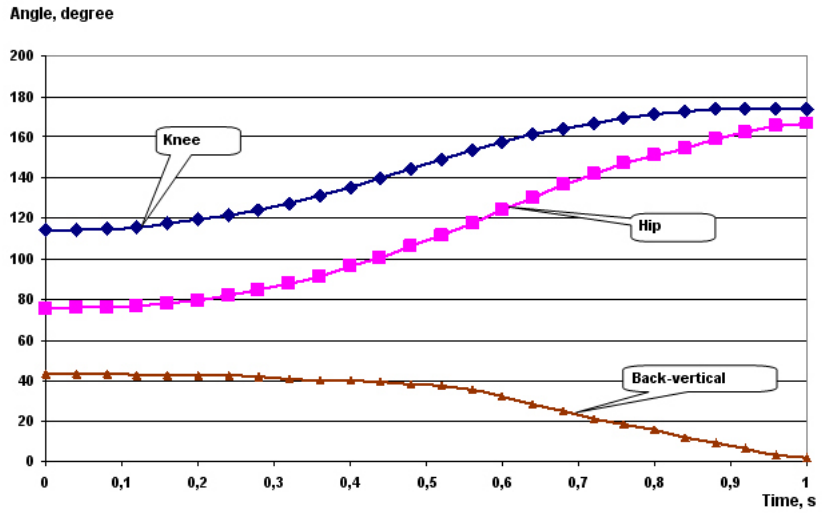
Tasks of the research:

1. To analyse a technique of execution of competitive exercise in powerlifting.
2. To prove a technique of improvement of technical skill of competitive exercise in fitness experimentally.

Material and methods of the research. Masters of sports in powerlifting and candidates for the master of sports in powerlifting – members of a national team of the Kharkov area on weightlifting and powerlifting took part in the research. Methods were used: theoretical analysis and generalization; analysis of scientific literature; pedagogical supervision; pedagogical experiment; video registration method; methods of mathematical statistics.

Results of the research and their discussion. *Analysis of a technique of execution of dead lift.* The analysis of a technique of execution of dead lift by highly skilled sportsmen was carried out – members of a national team of the Kharkov area on weightlifting and powerlifting. Masters of sports in powerlifting and candidates for the master of sports in powerlifting took part in the research. We asked sportsmen to execute competitive exercise dead lift for video registration implementation. It should be noted that the equipment for video was installed at an angle 90 degrees to demonstration at distance about 5 meters. It had to guarantee supervision over shift/movement and consider possible mistakes. Records were made for a series pulled in classical style and style of sumo. One-time repetitions were executed approximately in 80% range from 1 limit maximum of a sportsman.

Processing of video filming was carried out by means of the program Dartfish©. A change of angles of biolinks at a draft performance by the sportsmen No. 1 and No. 2 is shown respectively in pic. 1 and pic. 2.

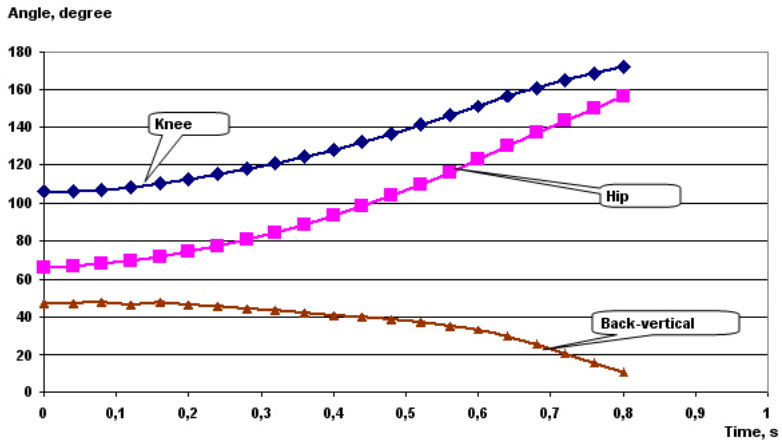


Pic. 1. Change of angles between biolinks in the course of the draft performance by the sportsman No. 1

In such look data on angular characteristics is low-informative. Much more the volume of information it is possible to receive knowing the speed of change of angles of biolinks. For this purpose we will differentiate curve changes of angles on time. The result is presented in pic. 3 and pic. 4.

The draft performance by the sportsman No. 1 begins with a simultaneous extension of knee and coxofemoral joints during 0,44 s, thus during the first 0,2 about the speed of extension knee – than the speed of the coxofemoral increases linearly and above. The angle between a back and a vertical remains approximately constant by the time of 0,3 s. Further, the speed of extension of knee and coxofemoral joints are almost identical from the moment of 0,24 s and to 0,4 s.

Since the moment 0,44 s, the speed of extension of a knee joint starts decreasing, forming an excess (extremum) on graphics of speed and from the moment of 0,54 s its change is almost linearly. At this time the main contribution to straightening brings a coxofemoral joint. It continues to increase extension speed up to the moment 0,64 s, and further also, passing an extremum, forms a linear recession.



Pic. 2. Change of angles between biolinks in the course of the draft performance by the sportsman No. 2

The beginning of reduction of speed of extension of a coxofemoral joint (0,64 s) coincides with the end of straightening of a back concerning a vertical. Thus, the exercise can be broken into four stages.

1. 0–0,3 s – is an active work of knee and coxofemoral joints. The angle between a back and a vertical remains mainly invariable.

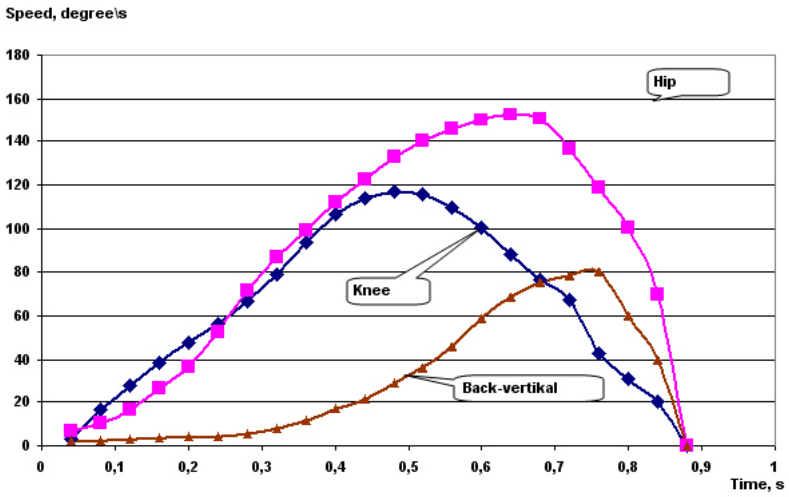
2. 0,34–0,44 s – the end of an active work of a knee joint, the beginning of straightening of a back concerning a vertical.

3. 0,44–0,64 s – the end of an active phase of straightening of a coxofemoral joint and back concerning a vertical.

4. 0,64–0,9 s – the final straightening of all biolinks who take part in the performance of the exercise.

The preservation mainly invariable an angle between a back and a vertical to the end of extension of a knee joint (so-called the rack "sumo") allows building to a minimum load of a lumbar department of a spine column and by that to prevent a possible traumatism.

Otherwise the athlete No. 2 carries out the exercise. By the first at it the hip starts being unbent, and only then enter turn of a knee. Further, as well as at the sportsman No. 1 at the second stage, the speed of extension of a hip exceeds knee speed, however this extension happens synchronously by the time of a simultaneous extremum after which speed of extension of both biolinks starts decreasing. The difference in the performance is also observed in a change of an angle between a back and a vertical. In this case this change begins from the beginning of the performance of the exercise and lasts with the growth of speed practically by its end.

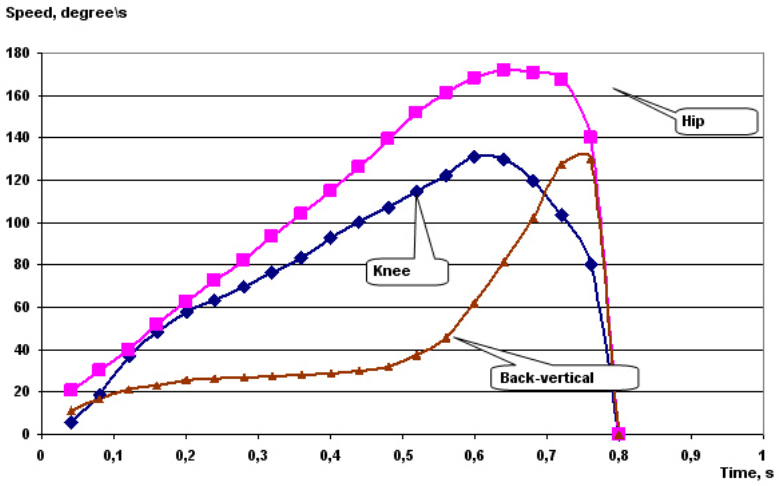


Pic. 3. Speed of change of angles between biolinks in the course of the draft performance by the sportsman No. 1

Thus, here it is possible to allocate only two stages:

1. Simultaneous extension with the increase of speed of all biolinks that take part in the performance of the exercise (0–0,64 s). Including straightening of a back concerning a vertical.

2. Completion of extension of biolinks (0,64–0,82 s) with a reduction of speed. The finishing breakthrough by a back for the achievement of a vertical situation.



Pic. 4. Speed of change ofangle between biolinks in the course of the draft performance by the sportsman No. 2

Introductions of a technique of improvement of technical skill. We developed a number of the methodical recommendations which are submitted on finishing technical skill, to sportsmen of the first category to the level of candidates for the master of sports and masters of sports on the basis of the analysis of a technique of execution of competitive exercise made by means of the program dartfish dead lift by highly skilled sportsmen.

The ideal technique of classical dead lift:

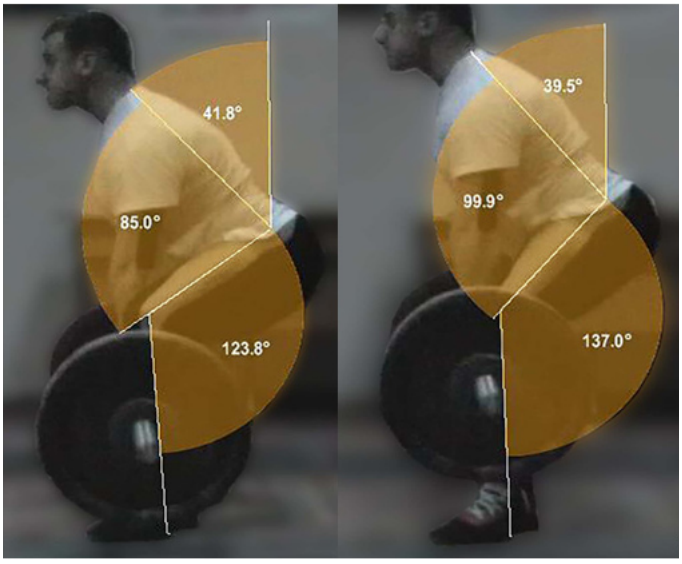
1. A back in draft has to remain equal during the whole movement.
2. In starting situation a pelvis can be lifted above or lower depending on specific features of a sportsman.
3. The direction of starting effort – back and up.
4. The projection of the center of weight has to pass through the fifth.
5. The rate of a performance of draft – is slow, uniform.
6. The statement of feet – is a little already shoulders, foot parallel to each other.
7. Dashing of a bar – on width of shoulders or a little wider (it is usually used different dashing).

Characteristic motive errors of competitive exercise “draft”:

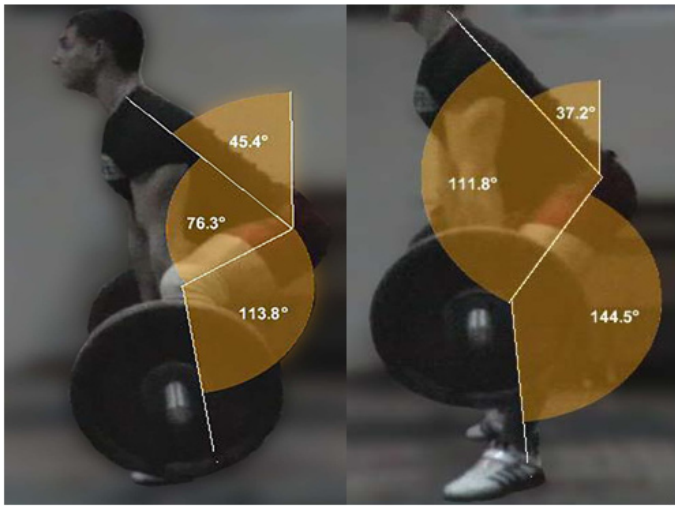
1. A big gap between a signature stamp of a bar and a body throughout a rise.
2. A “concave” back.
3. A deviation back at draft end.
4. A “dead” point at the level of knees.

These mistakes considerably don’t allow sportsmen to come to results which answer their potential opportunities.

According to the settled concepts about a rational and effective way of a performance of exercises of powerlifting it is possible to carry such requirements to bases of a technique of movements of competitive exercises:



Pic. 5. Videogramms which illustrate changes of angles between biolinks in the course of the draft performance by the sportsman No. 1



Pic. 6. The videogram which illustrates changes of angles between biolinks in the course of the draft performance by the sportsman No. 2

1. Creation in the working joints of the optimum angular relations, especially in the heaviest sites of a way of raising of a bar (for example, in "dead points") when it is impossible to use its movement on inertia. Consecutive inclusion in work of certain muscular groups, at first stronger, then – less strong.

2. Providing on each site of a way of rising of a bar of the most rational direction of its movement and a message to it optimum speed.

3. Creation of necessary conditions which provide the efficiency of a performance of a final way of a bar.

4. Creation of necessary basic conditions to a body of the sportsman and his different links for the purpose of longer and effective transfer.

The introduction of the developed technique was carried out only in the experimental group (5 sportsmen). Other 5 sportsmen of the control group trained without a use of our technique. The essential difference of techniques is in a group that in the experimental group of planning was carried out taking into account a video registration technique. Differences weren't between the control and experimental group on the volume of the carried-out loading in number of raising of a bar (nrb).

In the experimental group, thanks to the program of video registration, we managed to establish rather precisely asynchronous movements at the performance by sportsmen of the competitive exercise of powerlifting "draft". It is obvious that technical shortcomings of such character can lead not only to the decrease in the competitive productivity, but also to serious traumatizing of a sportsman. Such control method of a technique of execution of competitive exercises of powerlifting will allow to enter in due time amendments into the training process of sportsmen, using specially preparatory exercises with emphasis on prevention of any distortions. It is also expedient to use exercises for the elimination of a power disproportion of muscles of the left and right parts of a body (various drafts by one hand and so forth).

Besides, it is established that the powerlifter "releases" a pelvis at the beginning of a bar separation from a scaffold, and thus he transfers load more of back muscles. It, in our opinion, can testify that muscles of a back of the sportsman are

stronger than muscles of feet, or it can be a consequence of accumulation in the last of fatigue after the first competitive exercise "knee-bend".

Attempts which are carried out by powerlifters on the verge of opportunities, not always are ideal by the settled technique. But such deviations from "ideal" should be considered not every time as shortcomings and mistakes at high-class sportsmen. Sportsmen find the most optimum option of a technique of execution of exercise in overcoming of the maximum weight considering a situation, a condition of preparedness and specific features. Therefore the improvement of sports skill needs to be carried out not only due to strengthening of weaknesses, but also due to the subsequent development of stronger, that is it is necessary to try to arrange more equipment under the athlete, and not vice versa.

Before the experiment we recorded the best results in dead lift of sportsmen of the experimental and control groups. The analysis of results of the research by t-criterion testifies that there weren't divergences ($p<0,05$) by the beginning of the pedagogical experiment between sportsmen of the experimental and control groups on indicators of the general physical fitness. At a final investigation phase, from March 16 to March 26 in 2015, we held the repeated testing of sportsmen of the experimental and control groups in dead lift for the purpose of comparison of results at the beginning and at the end of the research.

By the method of mathematical statistics we turned the set of the separate empirical data which are obtained as a result of the research on the system of forms and numbers, evident for a perception, which formed the basis for the implementation of scientific conclusions in the qualification work.

By the results of the research it is possible to draw a conclusion that the improvement of indicators is observed both in the experimental, and in the control groups.

Errors are noticed as a result of the pedagogical supervision that sportsmen made in the course of the repeated testing. Mistakes were defined in dead lift in three attempts. Total of mistakes which were made in dead lift by the sportsmen, were 11. Sportsmen of the control group made 8 mistakes in the course of the repeated testing, and the sportsmen of the experimental group – 3 mistakes that confirms the highest level of assimilation of a technique of competitive exercises by the sportsmen of the experimental group. According to Styudent's criterion ($p<0,05$) the reliable differences are found out in number of mistakes that the sportsmen of the control and experimental groups made during the repeated testing.

The comparative analysis of results of the pedagogical supervision over the competitive activity of the sportsmen of the experimental and control groups allows to claim that sportsmen of the experimental group made a smaller quantity of mistakes.

As for a gain of sports result,) it is visible from these tables (tab. 1 and 2that the greatest gain of result made 7,8 % for the end of experiment in the control group, the smallest – 1,6%. In the experimental group the greatest gain – 10,2%, the smallest – 3,4%. Thus, the general gain of result made 4,7% during the experiment in control group and 7,2% in the experimental group.

Table 1

Results of the performance of dead lift by the sportsmen of the control group

№ of sportsman		1	2	3	4	5
The best result in dead lift, kg		275	275	245	245	320
Before the beginning of the experiment	Draft, kg	260	255	242,5	240	300
	Ratio kg with the best result of %	94,5	92,7	99,0	98,0	98,3
At the end of the experiment	Draft, kg	275	272,5	247,5	247,5	315
	Ratio kg with the best result of %	100	99,0	101,0	101,0	98,4

Table 2

Result of the performance of dead lift by the sportsmen of the experimental group

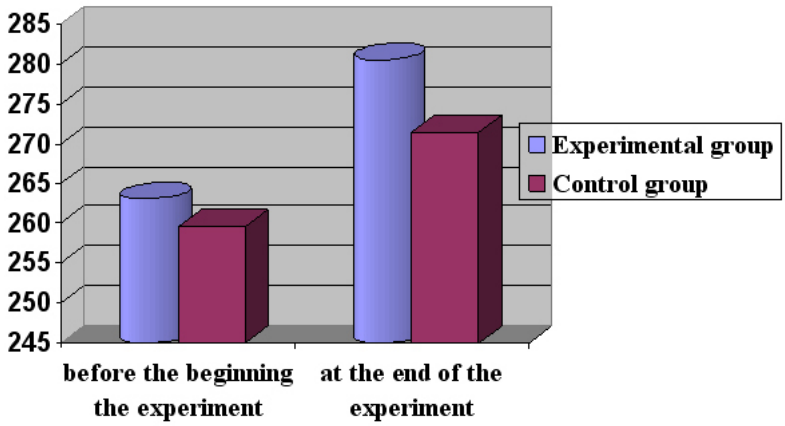
№ of sportsman		1	2	3	4	5
The best result in dead lift, kg		275	275	245	245	320
Before the beginning of the experiment	Draft, kg	262,5	237,5	240	285	290
	Ratio kg with the best result of %	95,5	96,9	98,0	96,6	93,5
At the end of the experiment	Draft, kg	280	257,5	257,5	295	312,5
	Ratio kg with the best result of %	101,8	105,1	105,1	100	100,8

The schematically comparative analysis of indicators in the control and experimental groups after the experiment ($p<0,05$) is shown in pic. 7.

Conclusions. Thus, it is possible to draw a conclusion that the result gain was more significant in the experimental group during the experiment, that is bigger. The average result in dead made 263 kg ($p>0,05$) in experimental group lift before the experiment and 259,5 kg ($p>0,05$) in the control group. At the end of the experiment the average result in dead lift made 280,5 kg ($p<0,05$) in the experimental group and 271,5 kg ($p<0,05$) in the control. In percentage expression the result gain made 6,46% in the experimental group and in the control – 3,38%. As we see, the improvement of indicators is observed both in the experimental, and in the control groups, but in the experimental group is on 3,08% more, and it will give to sportsmen a considerable advantage during the competitive activity.

Table 3
Ratio of average values in the control and experimental groups

Group		Experimental group		Control group		
Research measurement		$\bar{X}$	σ	$\bar{X}$	σ	p
The best result in dead lift, kg, before the experiment	Draft, kg	263	2,26	259,5	2,25	>0,05 (enough)
	Ratio kg with the best result of %	96,1	2,26	96,5	2,25	
The best result in dead lift, kg, at the end of the experiment	Draft, kg	280,5	2,31	271,5	2,15	<0,05 (enough)
	Ratio kg with the best result of %	102,56	2,31	99,88	2,15	



Pic. 7. The comparative analysis of indicators in the control and experimental groups after the experiment (p<0,05)

A uniformity of the group structure was observed in both groups during the whole experiment. From what it is possible to draw a conclusion on a uniform gain of results during the experiment at all its participants.

It is experimentally proved that the use of computer programs of video registration allows improving qualitatively the return communication between the coach and the sportsman, optimizing the process of training of the sportsman and the correction of his technique, increasing a gain of sports result.

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Influence of specially directed exercises on separate functions of sensor-based systems of pupils of junior classes

Abstract. ***Purpose:*** *to define dynamics of separate functions of sensor-based systems of children of primary school age as a result of specially directed physical exercises.* ***Material and Methods:*** *306 pupils of the 1st – 3rd classes of a comprehensive school of Kharkov took part in the research. The following methods were used: theoretical analysis of scientifically methodical literature, pedagogical experiment, pedagogical testing, methods of mathematical statistics, and methods of determination of separate parameters of touch functions (perimetry, acumetry, esthesiometry and others).* ***Results:*** *the assessment of a functional condition of visual, acoustical, vestibular, tactile analyzers and visual-motor reaction is carried out; the age distinctions in indicators are considered; the extent of influence of specially directed exercises on separate functions of the studied sensor-based systems is defined.* ***Conclusions:*** *the positive influence of specially directed exercises on a condition of separate functions of vestibular, acoustical, visual and tactile analyzers at pupils of junior classes is established.*
Keywords: *sensor-based systems, pupils of junior classes, physical education, specially directed exercises.*

Introduction. The problem of the increase of the level of motive preparedness and indirectly of a state of health of younger generation of Ukraine remains one of the priority as the deterioration of a state of health is observed in a third of children after the first year of a study at school which progresses during the entire period of a study in general education educational institutions [5]. Deteriorations of a state of health of children connect, mainly, with the decrease in the level of their physical preparedness, caused by the reduction of physical activity as a result of a study which is oversaturated by subject matters where a static component prevails [2; 4; 11; 15].

The leading role in the process of a study, the development of motive qualities, formations of the motive sphere of children play touch systems (visual, vestibular, acoustical, tactile) [1; 6; 12–14; 16].

A number of researchers note a considerable influence of analyzers on the manifestation of coordination abilities, speed, flexibility, force and endurance [1; 7–10; 14]. In their opinion, influencing a functional condition of touch systems act on the development of motive qualities becomes mediately. That is, the level of physical preparedness can be regulated due to the activity of the main touch systems.

A number of authors in the works indicate the increase of activity of separate analyzers at the investigated of different age as a result of special exercises: O. K. Moiseyenko [10] – at children of a preschool age, I. O. Kuzmenko, L. Y. Shesterova [3, 16] – at children of a middle school age; L. O. Magomedov [6] – at children of a school age with defects of sight and so forth. A question of a complex influence of specially directed exercises on a functional condition of touch systems of children of a younger school age remains insufficiently studied, that proves a relevance of our research.

Communication of the research with scientific programs, plans, subjects. The research is carried out according to the thematic plan of the research work of Kharkov state academy of physical culture for 2013-2015 by a subject 3.5.29. "Theoretical and applied bases of the creation of monitoring of physical development, physical preparedness and physical condition of different groups of the population".

The objective of the research: to define dynamics of separate functions of touch systems of children of a younger school age as a result of specially directed physical exercises.

Material and methods of the research. Research methods: the theoretical analysis and synthesis of data of scientifically methodical literature, pedagogical experiment, methods of mathematical statistics, methods of determination of separate parameters of touch functions which included: *in the visual analyzer* – a perimetry method where limits of achromatic were defined (colourless) field of sight of two main meridians – horizontal and vertical with the use of a perimeter of Forster; *in the acoustic analyzer* – a method of acumetry where bone and air conductivity of sound waves was investigated with the use of a tuning fork 140 Hz*;* a resistance of a *vestibular apparatus* to rotary loadings on the Barany chair (5 turns for 10 s) was determined by the following indicators *in the vestibular analyzer*: a deviation from a straight line in walking blindly on 5 m of a piece, speed of run, when performing a certain task and accuracy of creation of a movement in an elbow joint with the use of a kinematometr of N. M. Zhukovskyi; *in the tactile analyzer* – a method of esthesiometry where a tactile sensitivity on different sites of skin is defined) with the use of Weber's compass; *in visually motor reaction* which displays a condition of CNS, a simple motive reaction to a light signal was investigated by means of the device IPR-01.

The researches were conducted on the basis of GES No. 143 in Kharkov. 306 pupils of the 1-3rd classes took part in them from whom 3 experimental and 3 control groups were created. The first group – pupils of the 1st classes; the second – pupils of the 2nd classes; the third – pupils of the 3rd classes.

During the academic year pupils of the control groups were engaged on the standard state program of physical culture, and special exercises and outdoor games joined additionaly which are directed on the increase of a functional condition of separate analyzers and before the educational process of physical training of experimental groups, with the standard program. So, exercises with the determination of a distance between different subjects; exercises on the improving system of Huashan school of Dao and Hatha yoga; exercises at a performance of which movements by hands or feet were followed by eyes, with subjects where the direction of movements of subjects was fixed by eyes and others were used for *the visual analyzer*. The representation of orders with a change of a timbre and loudness; musical maintenance with a change of speed and a rhythm; exercises on attention with the use of sound irritations and hindrances; a performance of exercises

at a limitation of opportunities of the acoustical analyzer and others were applied to influence on *the acoustic analyzer*. For *the vestibular analyzer*: jumps with turns on 90°, 180° and 360° with different starting positions of a head; run and walking with unexpected stops; rotation round own axis; fast inclinations of a head and a trunk; a performance of the listed exercises in the absence of a visual control and others. For *the tactile analyzer:* movements by fingers of one hand or two hands at the same time; the use of the principle of opposition of fingers of hands; definitions of forms and sizes of different sports subjects, and also their difference, by character of a surface without a visual control but other, and also the modified outdoor games with the use of all listed exercises.

The special exercises were joined in preparatory, main and final parts of a lesson, in sports minutes at lessons on general education subjects, in the system of organized breaks and were given in the form of homeworks.

Results of the research and their discussion. The analysis of the data of the primitive research showed that results of measurement of volume of a peripheral sight are lower than norm (boys of the 1-3rd classes have the top limit 34,35 – 41,94°; the lower – 42,65–55,29°; the internal – 44,15–52,38°; the external – 61,65–74,94°, at girls of the 1-3rd classes – 38,06–41,76°; 41,06–55,18°; 44,09–51,79°; 65,18–73,71° respectively). In sexual and aged aspects the domination of these boys over indicators of girls is observed and with the age these results generally improve, however it is doubtful ($p>0,05$).

After carrying out the experiment the volume of peripheral sight authentically improved at pupils of the experimental groups ($p<0,05$-$0,001$) (at boys – the top limit became 42,65–48,03°; the lower – 56,0–62,56°; the internal – 52,79–57,76°; the external – 75,41–86,32°, at girls respectively 43,21–47,71°; 53,41–60,76°; 51,24–56,0°; 76,29–84,44°). The gain at boys of the I group makes – 20,9%; II – 12,6%; III – 16,4%, at girls is 15,7%; 11,7%; 14,2% respectively. The most substantial increase of indicators is defined at pupils of the I age group. The dynamics of results remained the same, as in the primitive research in sexual and aged aspects.

After carrying out the primitive researches the sound audibility duration indicators at air and bone conductivity were at a rather low level and made: the air conductivity – at boys 9,65–11,18 s (a right ear), 9,91–11,68 s (a left ear); at girls respectively – 8,97–9,53 s and 9–10 s; the bone conductivity – at boys 6,65–7,47 s, at girls was 6,59–7,32 s. Generally the reliable prevalence of results of the air conductivity of boys over the data of girls is observed in the sexual aspect. The exception is made by indicators of the I age group where differences are doubtful ($p>0,05$). The data of the bone conductivity have no reliable differences ($p>0,05$). These results improve with the age mainly.

After the experiment the sound audibility duration authentically improved at pupils of the experimental groups ($p<0,05<0,001$). So, at boys of the I age group the gain in indicators of the bone conductivity makes – 27,5%, the air conductivity of a right ear – 22%, a left ear – 21,3%; the II groups – 23,9%, 23,8%, 20,2% respectively, III – 31,7%, 26,8% and 24,6%. Girls of the I groups have – 21,5%, 19,9% and 22,8%; II – 16,5%, 25,6% and 23,1%; III – 26,3%, 30,5% and 25% respectively. The most considerable gain of duration of the audibility of a sound is noted at pupils of the III age group. Generally the more significant increase in indicators of the air conductivity is observed at girls of all age groups when comparing with boys. It isn't revealed in sexual and aged aspects of considerable changes when comparing with the output data.

The analysis of the initial indicators of vestibular firmness testifies to the insufficient development of the vestibular analyzer as all indicators which display its functional state, authentically worsened after rotary loadings ($p<0,05$–$0,001$). In direct walking a deviation size from a straight line varied: at boys – before a rotation from 35,24 to 58,24 sm, after – from 114,10 to 153,10 sm, at girls – before a rotation from 50,59 to 60,91 sm after – from 97,90 to 174,06 sm; in speed of a performance of a certain task: at boys – before a rotation from 6,31 to 7,20 s, after – from 6,92 to 7,75 s, at girls respectively – from 6,82 to 7,72 s and from 7,64 to 8,31 s; in the accuracy of acreation of the set movement amplitude: at boys before a rotation from 23,76 to 24,71°, after – from 20,18 to 20,56°, at girls respectively – from 22,88 to 27,47° and from 21,65 to 27,59°. The analysis of data in the aged aspect showed that in children improved indicators with age in speed of run, and in a direct walking and the accuracy of a creation of the set movement amplitude these changes have multidirectional character. On sex the prevalence of results of boys is revealed by data of a direct walking and speeds of a performance of a certain task, and on indicators of a creation of the set amplitude of the movement the opposite tendency is found (results of girls dominate over indicators of boys).

The analysis of the results received after the experiment showed a considerable improvement of firmness of the vestibular analyzer by all parameters of pupils of the experimental groups. So, the size of a deviation varied at boys in a direct walking– before a rotation from 19,94 to 26,4 sm, after – from 39,19 to 57,24 sm, at girls – beforea rotation from 22,65 to 29,03 sm, after – from 46,24 to 60,5 sm; in speed of a performance of a certain task: at boys before a rotation from 6,01 to 6,68 s, after – from 6,70 to 7,66 s, at girls respectively – from 6,46 to 7,11 s and from 6,68 to 7,45 s; in the accuracy of a creation of the set movement amplitude: at boys before a rotation from 24,2 to 24,5°, after – from 24,5 to 25,29°, at girls respectively – from 23,9 to 25,76° and from 24,38 to 25,5°. Comparing the data before and after the vestibular loading after the experiment, it is revealed that after a rotation, as well as before the experiment, results of pupils of all age groups worsen, however these changes are less essential and not always reliable (in a direct walking the deterioration of results after a rotation has a reliable character ($p<0,01$–$0,001$), and according to run speed when performing a certain task and kinematometry of reliable differences isn't observed in indicators ($p>0,05$)). Thus, comparing the received results before and after the experiment after the vestibular loading, it is revealed that after the application of special exercises indicators of all studied parameters significantly changed and these differences generally have a reliable character. So, after the vestibular irritation by the data of a direct walking at boys of the I group results improved for 64,4%; II – 55,1%; III – 74,1%, at girls – for 46,5%; 65,2% and 71,9% respectively. On indicators of speed of run when performing a task the gain of results makes: boys of the I groups have – 10,3%; II – 7,2%; III – 9,1%, at girls – 10,3; 10,0; 12,9% respectively. According to kinematometry, boys respectively have 19,9%; II – 15,6%; III – 23,0%, at girls were 13,0%; 11,4% and 6,7%. The most essential changes mainly took place at pupils of 9 years old, except for indicators of speed of a performance of a task at

boys and kinematometry at girls where the gain of results of pupils of 7 years old prevails. In the aged and sexual aspects the dynamics of results didn't change. It should be noted that differencees are insignificant and doubtful for the sex on the deviation of indicators in walking and accuracy of a creation of the movement ($p>0,05$), and according to speed of a performance of a certain task – reliable ($p<0,05–0,01$).

According to the primary measurements it is established that indicators of the tactile sensitivity on the middle of a palm and the 3rd phalanx of a finger are lower than norm and are in limits: at boys – from 1,41 to 1,50 sm, in girls – from 1,51 to 1,70 sm and in boys – from 0,61 to 0,80 sm, in girls – from 0,65 to 0,75 sm respectively. Indicators insignificantly are above norm and fluctuate in limits by the results of measurement of sensitivity on a back surface of a hand and a forearm: at boys – from 1,66 to 2,20 sm, in girls – from 2,06 to 2,28 sm and at boys – from 2,29 to 2,71 sm, in girls – from 2,54 to 2,89 sm respectively. Such difference in standard indicators can be explained to that the presented norms aren't graduated on an aged sign. On age and sex indicators don't differ authentically ($p>0,05$).

The data of tactile sensitivity at pupils of the experimental groups considerably improved and began to be in limits after introduction in the process of physical training of specially directed exercises: on the middle of a palm – at boys – from 0,95 to 1,15 sm, at girls – from 1,04 to 1,16 sm; to the 3rd phalanx of a finger – at boys – from 0,46 to 0,55 sm, at girls – from 0,44 to 0,50 sm; on a back surface of a hand – at boys – from 1,34 to 1,83 sm, at girls – from 1,49 to 1,87 sm and a forearm – at boys – from 1,72 to 2,33 sm, at girls – from 1,86 to 2,46 sm. Thus it should be noted that according to measurement of sensitivity on the 3rd phalanx of a finger and the middle of a palm of improvement has a reliable character in all age groups ($p<0,05–0,001$), by the results of measurement of a back surface of a hand changes are reliable at pupils of the III ($p<0,05–0,001$) and boys of the II age group ($p<0,05$), and forearm indicators authentically improved only at pupils of the III group ($p<0,05$). The gain of results on the data of measurement of sensitivity on the 3rd phalanx of a finger at boys of the I age group makes 31,2%; II – 30,3%, III – 23,8%, at girls – 33,3; 32,8 and 35,2% respectively. Behind results of measurement of sensitivity on the middle of a palm at children of the I group – 20,6%; II – 26%; III – 35,8%, at girls – 23,5; 29,2 and 31,1% respectively. On indicators of a back surface of a hand at boys respectively – 16,8; 18,3 and 22%, at girls – 13,4; 15 and 29,7%. According to the measurement of sensitivity of a forearm the gain at boys made 13,7; 13,2 and 24,8%, at girls – 14,2; 10,8 and 26,7%. The most considerable improvement of the results on all indicators of tactile sensitivity is defined generally at pupils of the III age group. The 3rd phalanxes of a finger of children make the exception of these measurements of sensitivity where the greatest shifts are observed in the I age group. Dynamics of indicators in sexual and aged aspects didn't change significantly.

During the primary research it was established that the time of visually motor reaction was in limits: at boys – from 0,78 to 0,88 s, at girls – from 0,67 to 1,07 s, with age these results improve, however it is doubtful ($p>0,05$). In the sexual aspect it is revealed that in the I and II age groups boys react to a signal, than girls, and in the III group quicker, opposite – girls own a faster visually motor reaction, and these differences have a reliable character ($p<0,05–0,001$).

After the application of the specially directed exercises the indicators of time of a motive reaction authentically improved at pupils of the experimental groups ($p<0,05–0,001$) and began to be in limits: at boys – from 0,67 to 0,74 s, at girls – from 0,6 to 0,91 s. The gain of results at boys of the I age group makes 14,9%; the II groups – 15,2%; III – 15,1%, at girls are 14,1%; 13,4% and 13% respectively. The greatest improvement of results is observed at boys of 8 years old and girls have at 7 years old, besides the more essential gain in indicators is noted at boys, than at girls. In sexual and aged aspects the tendency remained the same, as well as in the primitive research.

During the experiment some changes in a functional condition of separate functions of touch systems took place at pupils of the control groups, but these changes also, when comparing with results of pupils of the experimental groups,are less essential and doubtful ($p>0,05$).

Conclusions:

1. The data of the primitive researches allowed establishing the insufficient level of the development of vestibular, acoustical, visual and tactile analyzers at pupils of junior schools.

2. The application in the course of physical training of the specially directed exercises positively affected a functional condition of the studied touch systems.

Prospect of the subsequent research in this direction is the definition of the influence of specially directed exercises on a functional condition of touch systems of pupils of senior schools, vocational-technical schools and students of higher educational institutions.

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Application of medical physical culture at extensive superficial burns of the I–II degree

Abstract. ***Purpose:*** *to study and prove purpose of medical physical culture at extensive superficial burns of the I–II degree for normalization of exchange processes, the prevention of the developments of stagnation connected with the compelled decrease in physical activity.* ***Materials and Methods:*** *analysis and generalization of scientific and methodical literature.* ***Results:*** *the main means of physical rehabilitation – medical physical culture is considered; its application at treatment of patients with extensive superficial burns of the I–II degree is proved; techniques of medical physical culture in the period of little burn shock and in the period of a sharp toxemia are described in detail.* ***Conclusions:*** *it is established that occupation duration remedial gymnastics depends on a condition of the patient and objectives. In each occupation the all-strengthening, breathing and special exercises, as a rule, have to be applied. The most important feature of a technique of occupations at a burn disease is need of repeated performance during the day of the special exercises directed on prevention or elimination of malfunction of the musculoskeletal device.*
Keywords: *physical rehabilitation, superficial burns, medical physical culture, burn shock, sharp toxemia.*

Introduction. The relevance of a problem of a burning injury is defined by the considerable frequency of a defeat as adults, and children, the complexity and duration of a treatment, the long disability and rather high lethality of victims [7]. The damage of issues of an organism resulting from a local action of high temperature, and also chemicals, electric current or ionizing radiation are called burns. Scales of a defeat by burns increase continuously around the world for the last decades. According to data of WOH, thermal defeats take the third place among other injuries, and in some countries, for example in Japan, – the second place, conceding only to transport injuries. To some extent it is explained by a high installed power of modern production, transport, a wide use of high-tension currents, aggressive chemical and explosive substances. It is necessary to emphasize that till 70% of burns appear in house conditions, but not on transport and production [8; 9; 11].

A search of new ways of treatment of a burning injury and its consequences remains up to date, in particular non-drug.

At first, mosaicism of a defeat is peculiar to the majority of burns when burns of various depths are localized on various sites. The second factor defining weight of a defeat at burns is its area which is usually expressed as a percentage to the general surface of a body. The third factor influencing a severity of burns is the age. Children and old men have a skin thinner therefore similar burns cause in them deeper defeats and proceed heavier owing to physiological features of an organism. Severity of burns is influenced by a location of a burn and a state of health of a victim along with the depth, the age and the area, [8].

The four-sedate classification is accepted for the characteristic of depth of a defeat of tissues: the I degree of a burn is characterized by a damage of a blanket of a skin (epidermis) and is followed by hypostasis, reddening, morbidity; the II degree –bubbles with a transparent liquid are formed in thickness of epidermis. Burns of the I and II degrees belong to superficial, their treatment is conservative. Burns of the III degree are subdivided into degrees of IIIA and IIIB. At the IIIA degree the necrosis of tissues partially takes a growing layer of epidermis, big bubbles strained with liquid contents or already burst are observed. At burns of the I-II and IIIA degree the epithelization is possible as a growing layer of epidermis remains and therefore they heal in 1–3 weeks. Burns of the IIIB and IV degree belong to deep, their treatment is surgical [8; 10].

A burn disease develops at the superficial burns (degree I-IIIA) exceeding 10–12% of a surface of a body [6].

A burn disease is a pathological state which is developing as a result of extensive and deep burns, followed by peculiar violations of functions of the central nervous system, exchange processes, activity of cardiovascular and respiratory systems, endocrine frustration etc. [5; 11].

In pathogenesis of a burning disease allocate three groups of mechanisms defining its emergence and development: a) action of the most thermal agent; b) influence of wound (inflammatory) process; c) secondary disorders of activity of functional systems of an organism. A burn wound is considered as a starting and supporting mechanism of illness. The severity of a burn disease depends mainly on the area and depth of burns.

In the process of the development of a burn disease 4 main periods (stage) of its current allocate: I – a burn shock (2–3 days last) – a consequence of a painful impulsation; II – a sharp toxemia (3–12 days) – a receipt in blood of bacteria and toxins; III – septicotoxemia (a consequence of suppuration of a burn wound), lasts weeks, months; IV – a recovery. Complications of a burning disease: contractures cicatricial, osteoporosis, muscular atrophy [6].

It should be noted that the period of recovery comes, passing a stage of a burning septicotoxemia quite often under the influence of timely effective treatment [2; 11].

Communication of the research with scientific programs, plans, subjects. The work was performed according to the priority direction, determined by the Law of Ukraine "About the priority of the direction of development of science and technique" with a number 3.5. "Sciences about lives, new technologies of prevention and treatment of the most widespread diseases" within the priority of the thematic direction 3.5.29. "Creation of standards and technology of introduction of a healthy lifestyle, technology of improvement of quality and safety of food" on the subject "Traditional and nonconventional methods of physical rehabilitation at diseases of different systems of an organism and damages of the musculoskeletal device at persons of different degree of training ". Number of the state registration is 0111U000194.

The objective of the research: to study and prove a purpose of medical physical culture at extensive superficial

burns of the I-II degree for the normalization of exchange processes, the prevention of developments of stagnation in lungs which are tied with the compelled decrease in physical activity.

Research problems:

1. To study special literature on a problem of rehabilitation of patients with superficial burns and a burn disease.

2. To prove scientifically applications of a technique of medical physical culture at treatment of patients with extensive superficial burns and emergence at them I-II periods of a burn disease.

Material and methods of the research: analysis and generalization of scientific and methodical literature.

Results of the research and their discussion. One of the important components of modern complex treatment of thermal injuries is medical physical culture. On condition of timely and systematic application it is considered as the necessary mean promoting return of victims from burns to a socially useful work. Regular trainings of medical physical culture promote not only to the restoration of functionality of a patient and the increase of degree of readaptation to physical activities; under their influence treatment terms are reduced that has a great social value.

The correct combination of two major biological factors – physical activity and rest within the medical mode allows providing the best results of complex treatment, to reduce a gap between clinical and functional recovery [8].

It is known that a burn disease is followed by considerable violations of functions of vitals and systems. A long rest reduces biological activity of an organism, leading to the development of a hypokinetic syndrome. The decrease in the natural proprioreceptive afferentation which support a tone of the highest departments of a brain, a prevalence of a negative interoreception from an area of a burn wound are adversely reflected in a functional condition of the central nervous system.

Opportunity to have the normalizing effect on processes of excitement and braking in a bark of big cerebral hemispheres is the cornerstone of a therapeutic action of physical exercises, promoting restoration of the conditioned-reflex communications which died away in the period of a disease. The concept of the academician P. K. Anokhin about a role of functional systems of an organism according to which there are no the isolated functional systems is of great importance in an organism in understanding of mechanisms of medical action of physical exercises at a burn disease. The structural educations making them possess exclusive mobility. It causes the possibility of formation of the making active mechanisms which are capable to restore the harmonious activity of functional systems of an organism broken in connection with an illness. The use of physical exercises allows mobilizing effectively structural formations of functional systems for the achievement of a medical result.

It is established by researches of the last time that the proprioreceptive impulsation from the working departments of the musculoarticulate device through a reticular formation and hypothalamus renders a trophic impact not only on the functioning groups of muscles, but also on not exercised tissues of the musculoskeletal device. This circumstance explains mechanisms of trophic action of the physical exercises providing activation of exchange processes owing to strengthening of reflex and trophic influence of the central nervous system on an organism [11].

As a result of a performance of physical exercises even without the expressed strengthening of work of heart conditions of blood supply of tissues improve, there is an elimination of the phenomena of hypoxia. The role of physical exercises in activation of extra-cardiac factors of blood circulation is essential that substantially interferes with the development of a decompensation of blood circulation in patients, especially in the second and third periods of a burn disease.

The role of physical exercises is great in prevention and treatment of pneumonia at burn patients. Improving ventilation of lungs, strengthening blood circulation, physical exercises create favorable conditions for providing an organism with oxygen [4; 11].

Medical physical culture is shown to almost all patients at any localization of a burn, irrespective of the degree and the area of a defeat of tissue. The variety of clinical manifestations of a burn disease doesn't allow defining in advance all states at which medical physical culture is temporarily contraindicated. The following contraindications are allocated: burn shock, infectious complications, hepatitis, nephrite, hypostasis of lungs, deep burns of vessels and nerves, latent bleeding. In doubtful cases the issue of a purpose of medical physical culture has to be resolved only by the attending physician [1; 6, 11].

Forms of medical physical culture: morning hygienic exercises; remedial gymnastics; independent classes; gymnastics in water; health path. Mechanic-and work therapy, massage, elements of sport and outdoor games also find an application in classes with burn patients. Physical exercises prevent a restriction of mobility in joints, cicatrical and dermatogen contractures. The main reason for disability – burn hems and deformations [6; 8; 10].

The technique of medical physical culture in many respects depends on the degree and the area of a burn. Quickly passing local changes in a skin at burns of the first degree don't demand medical application of physical exercises.

At burns of the second degree a need can appear in for the exercises directed on restoration of elasticity of a skin, endurance to its pressure, mobility in joints of struck body segments after epithelization of their skin surface.

At a conservative treatment of superficial and also of small on the area deep burns of the third and fourth degrees, if the motive function is significantly not broken and the general condition of a patient remains good, classes by medical physical culture have the all-toning character. The special exercises promoting preservation of mobility in joints and to healing of the burned sites are used in them. It is recommended to begin classes from the very first days after a burn and to continue to an absolute recovery of a patient.

Gymnastic, ideomotor, applied and sports exercises and games are used in the course of classes of medical physical culture. Exercises with the local and dosed muscular tension, breathing exercises, extension exercises, on relaxation, exercises with burdening, corrective exercises, coordination exercises and in balance, exercises on a gymnastic and special apparatus and devices, elements of serial and front exercises are applied from gymnastic exercises.

The active movements in a zone of a burn are carried out with amplitude causing only a small morbidity. Extension exercises with a resistance and with special shells and adaptations (sponges, balls, pieces of a rubber of various elasticity,

expanders, etc.) belong to the active movements. The last are applied at later stages of a burn disease, at the increasing resistance of the formed hems when an impact only of the active movements becomes insufficient.

Except mobility in joints and forces of muscles, the restoration of the coordination of movements is necessary which is broken in connection with a burn.

This requirement is especially essential at burns of the lower extremities.

In the course of classes, both in a chamber, and in an office of medical physical culture, it is necessary to use various shells. They provide a necessary starting position, fixing of separate segments, a variety in classes and an emotional background, facilitate work of a methodologist.

It is necessary to apply widely the applied movements (a grab of various subjects, a clothing of clothes, a letter, a combing, a sewing etc.) and sports exercises (walking, climbing, elements of sports, walking on skis), especially in the conditions of out-patient and sanatorium treatments.

Duration of classes by medical physical culture is various: from 3–5 till 40 and more minutes.

The physical exercises which are applied as means of restoration after burns are necessary to be repeated many times. For this purpose also independent classes of patients on the instructions of a rehabilitologist are used during which it is necessary to pay special attention to exercises with various equipment (like pedal devices, rocking chairs, expanders, balls), and also to the elementary household movements [4].

Hyperkinesotherapy gives a good effect at burn patients. The performance of exercises in a heat bath (36-38°C) allows using the small force of atrophied muscles and that to promote the prevention of different types of contractures [9].

The choice of exercises depends also on the localization of burns and on the violations caused by them [4; 7].

V. A. Vasilyeva recommends beginning at burns, first of all, from the functionally favorable laying of the burned patient's extremities. On the elimination of the phenomena of a burn shock a respiratory gymnastics is appointed to a patient that he has to repeat during a day repeatedly. The performance of physical exercises needs to be begun in joints of the uninjured extremity, with a gradual involvement of joints which skin surfaces are burned. In the first days only the active movements are applied; in the subsequent for the achievement of bigger amplitude of movements in joints the help of a rehabilitologist is admissible. The emergence of fine-pointed hemorrhages on the burned skin surfaces isn't contraindication for carrying out classes. A small pain is admissible in the course of a performance of physical exercises.

Classes with patients are given during a day 2–3 times, in the first days shortly – 10–15 minutes, with frequent pauses for rest, and further duration of classes extend till 25–30 minutes. At emergence of pains during classes it is recommended to apply the distracting exercises. In intervals between classes the methodologist has to give to the burned extremity the situation in a joint that bent, unbent, considering localization of a burn. It is expedient to carry out physical exercises for the development of mobility in joints in the water environment (bath) during processing of the burned surfaces.

Elements of work therapy are applied at patients with burns of a hand (a grab and a rearrangement of various small subjects, a molding from plasticine and a warmed-up paraffin, knitting, etc.) [2].

Tasks and techniques of medical physical culture are also defined by the period of a burn disease and a condition of a patient.

When carrying out classes it is necessary to observe the general methodical principles (sequences, systematicity, regularities etc.), considering the general and local impact of exercises on a patient's organism.

Medical physical culture is appointed from the first days after a trauma (in the absence of contraindications) and continued to an absolute recovery. Absolute rest remains at heavy and average weight of shock, deep burns (danger of bleeding), and sepsis.

The easy all-strengthening, breathing exercises and careful active, not followed by pain, with a small number of repetitions, small on volume and short (2–10 min.) movements in the burned departments are shown in the I period of a burn disease. As the general condition of a victim remains still heavy, as a rule, only breathing exercises for the prevention of pneumonia are shown at this time. Static breathing exercises with emphasis on an exhalation (a breath through a nose, an extended exhalation through a mouth), repeatedly repeating them are applied during the day [3; 11].

The all-toning exercises (with a minimum loading), breathing exercises and carefully carried out active movements in the burned sites of a body raise a vascular tone and improve an action of the heart due to the stimulation of motor-and vascular and motor-cardial reflexes. The happening at the same time activation of motor-pulmonary reflexes is one of the measures of a fight against the hypostatic phenomena and atelectasis in lungs. The special breathing exercises mobilizing the mobility of a belly wall make active also the motility of intestines. The moderate increase of an exciting tone of a bark of big cerebral hemispheres happening under the influence of exercises promotes the gradual reduction of the postshocked braking and normalization of homeostasis, the reduction of expressiveness of reflex protective contractures. In it the small movements on volume by the struck body segments can play a special role. At expressiveness of the postshocked phenomena in order to avoid their aggravation on the one-two first classes it is necessary to be limited to use of breathing exercises [4].

At the initial stages of the development of a burn disease the special attention needs to be paid also to a position of a patient in a bed (a treatment by a situation). At first the victim accepts a pose which reduces a pain, but thus situation, vicious and unprofitable for a functional treatment is created, as a rule, (reduction of a hand to a trunk, bending in large joints, etc.) as gradually it is fixed also the contracture in process of healing of wounds and development of scarring turns in dermatogen, muscular or tendinous. So, for example, burns in a shoulder often cause the bringing contracture in a shoulder joint therefore from the first days after a burn the shoulder is given the provision of the maximum assignment. At hand burns the subsequent their laying is necessary after a performance of exercises on cultivation of fingers [8–10].

Problems of MPC in a stage of a sharp toxemia:

1) normalization of activity of the central nervous system, cardiovascular and respiratory systems;

2) prevention of complications (pneumonia, thrombosis, intestines atoniya);

3) improvement of trophic processes in the damaged fabrics;

4) preservation of mobility in joints of the damaged body segments;

5) prevention of malfunction in not affected extremities (prevention of contractures, atrophies of muscles, pulling together hems) [2; 8; 11].

Special breathing exercises, special exercises to treatment of complications and exercises promoting healing of wounds and preservation of movements in the struck parts of a body are applied in the II period of a burn disease [3].

As a body temperature only occasionally happens high (39-40os) during this period and is more often in the evenings, the appointment of medical physical culture is quite justified. However the general physical activity has to be minimum, it is necessary to avoid the hard-coordinative exercises, delays of breath and straining effort. Very important role is played by special exercises for the struck body segments; functional loading allows preventing the development as reflex (painful) restrictions of movements in joints, and restrictions which cornerstone pathologicoanatomic changes are. The most frequent type of damages of joints at burns of extremities – are cicatricial dermatogenetic contractures which are combined with mio- and artrogenetic approximately in 25% of cases. Postburn hems and deformations are the main reason of disability of the burned.

In the early period of a burn disease the dysfunction of joints in the form of rigidity is connected with the wrong position of the patient in a bed, with adynamia in joints as a result of dietotherapy. Such rigidity isn't a true contracture yet, however permanent violations can develop in a joint at long situation without movements. This circumstance predetermines a need of early and systematic performance of special exercises for the prevention of the development of contractures. To reduce the pain connected with a performance of movements it is recommended to carry out the active movements in a bathtub with warm water from the improved starting positions, applying the inclined planes, hammocks to suspension of extremities, etc. It is necessary to use widely exercises in relaxation of contracted muscles. A static stress of muscles, a parcel of impulses to the movements of symmetric sites of a body, and also ideomotor exercises are applied at impossibility to carry out the movements by the struck segments of a body. Early and persistent performance of special exercises promotes healing of burn wounds, prevents the development of contractures and muscular atrophies [1; 10].

In the second period of a burn disease breathing exercises gain extremely important value as means of a fight against the development of hypostatic pneumonia and violations of bronchial passability. Depending on the localization of a burn on a forward surface of a body (a breast, a stomach) the preference is given to diaphragm, or chest, to breath type with emphasis on an exhalation. The efficiency of breathing exercises increases when using plastic tubes from 500 to 800 ml. At a breath through an additional "dead" space also muscles of a neck, a breast, a stomach and a back that causes the increase of energy expenditure function and eliminates the hyperventilation phenomena arising at deep breath at rest. This exercise – a breath through a tube – needs to be carried out several times a day. A diaphragm breath with an extended exhalation and breath through a tube considerably improve the ventilation of the lower departments of lungs where most often there is a hypostatic pneumonia.

Classes have to be given with extra care and observance of the methodical rules accepted at classes with the patients suffering from chronic insufficiency of blood circulation of the corresponding stage. Owing to muscular weakness of exercise it is recommended to carry out from the improved starting positions. Performance of exercises in a heat bath (36-38°C) allows using the limited force of atrophied muscles. Remedial gymnastics in water can be carried out with patients after electrocardiographic researches, at satisfactory indicators of the electrocardiogram. The technique of remedial gymnastics in water consists in serial use of simple active and passive exercises.

The instructor who works with this contingent of patients has to be highly qualified, have profound knowledge about the changes happening in the patient's organism, and be able to select creatively necessary exercises, to be friendly, sensitive and sympathetic in relation to patients [11].

The large role in the increase of activity of the patient plays the accounting of efficiency of classes. Systematic carrying out the elementary functional and anthropometrical researches gives to the patient an evident idea of the positive changes happening in an organism under the influence of classes.

A treatment of such serious complication as a cicatricial contracture, demands a regular repeated performance of special exercises during the day for the increase in volume of movements in joints. A treatment is applied by the provision ("laying") for fixing of the reached result. The extremity keeps within in a functionally advantageous position; freight (salt, sand) weighing from 1 to 3 kg from above is put on bending or extension. This procedure lasts 8–10 min. In the process of the increase in amplitude of movements in a joint freight also increases. The repeated alternation of these procedures with mechanotherapy, hydrokinesotherapy allows reaching good results with cicatricial contractures and rigidity in joints [1].

Conclusions:

1. Various localization of a burn, unequal depth and the area of defeat, the variety of individual clinical manifestations of a burn disease don't allow using any standard complexes of remedial gymnastics in clinic. Even a selection of special exercises at identical localization of a burn has to be strictly individual, considering concrete violations of functions at this patient. One of the essential features of carrying out classes by medical physical culture with burn patients consists in it.

2. Medical physical culture is appointed at once after the patient's exit from a state of shock. At this time only breathing exercises are shown, as a rule. Early application of means of physiotherapy exercises – the best prevention of complications. Physical exercises raise a vitality of the patient, intensify blood circulation. Their role is great in prevention of pneumonia: improving ventilation of lungs, they create favorable conditions for providing an organism with oxygen. Long rest aggravates weight of a condition of the patient. Often, about three months and more, they are in inactive situation that leads to emergence of contractures of joints and muscular atrophies not only in affected areas.

3. In the second period of a burn disease when the toxemia phenomena develop, the physiotherapy exercises solve the following problems: normalization of activity of the central nervous system, prevention of complications from internals, improvement of trophic processes in the damaged tissues, preservation of mobility in joints of the damaged segments of

a body and prevention of violations in the intact. In the period of a sharp toxemia of a burn disease first of all the toning impact of physical exercises is used for the purpose of normalization of a homeostasis. Special breathing exercises are widely applied to prevention of pneumonia. However they should be cancelled at considerable rise in temperature and for the sharp course of complications from a liver, kidneys, a digestive tract, etc. (according to the corresponding indications) The special exercises which are necessary for treatment of complications are included in addition at renewal of classes.

4. Classes by remedial gymnastics as the main form of medical physical culture at a burn disease have the standard construction (introduction, main and conclusion). The duration of classes depends on a condition of the patient and objectives. In each class the all-strengthening, breathing and special exercises, as a rule, have to be applied. The most important feature of a technique of classes at a burn disease is a need of the repeated performance of the special exercises which are directed on prevention or elimination of malfunction of the musculoskeletal device during the day. The task of the instructor consists in explaining to the patient that successful restoration of movements in joints in many respects depends on its active relation to classes by medical physical culture.

Prospects of further researches. The studying and foundation of an application of medical physical culture at deep burns of the IIIB-IV degree are perspective.

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Control of the parameters of attention in basketball at the stage of preliminary basic preparation

Abstract. ***Purpose:*** *to determine the parameters of attention of basketball players aged 13–14 years old before and after the exercises of various kinds.* ***Material and Methods:*** *the study involved 3 teams of basketball players aged 13–14 years old from training groups. The total number of investigated people is 50. The study was carried out on the basis of Sports Children and Youth Olympic school № 5 in Dnepropetrovsk. We used the methods of theoretical analysis and synthesis of the literature, the method of analysis of documentary materials, pedagogical supervision, psychological testing, pulsometry, methods of mathematical statistics.The following techniques were used to determine the parameters of attention: «Mixed up line», proofreading test with Landoldt rings, proofreading test with letters.* ***Results:*** *during our research there was defined the predominantly low level of attention of basketball players at the stage of preliminary basic preparation. It was found out the specific nature of the load influences the decrease of the parameters in a greater degree, especially concentration, switching, and stability decline, the number of errors increases.* ***Conclusions:*** *on the basis of studies arises the necessity to improve monitoring systems in the Sports Children and Youth schools with usage of tests to determine the components of psychological readiness.*

Keywords: *young players, the stage of preliminary basic preparation, the control parameters of attention, technical and tactical actions.*

Introduction. The main tasks at the stage of the previous basic preparation is the profound check of a compliance of the previously selected contingent of children to requirements of a successful specialization in the chosen sport, the detection of expediency of the subsequent sports improvement and the definition of its direction (V. N. Platonov [5], O. A. Shinkaruk [9]).

The analysis of practical experience of basketball coaches testifies that they remain unsatisfied with the level of preparedness of young basketball players on the end of a study in groups of the initial preparation during the implementation of control and reverse tests when a selection of the most gifted and perspective sportsmen is in the educational-training groups that answers the stage of the previous basic preparation in basketball.

A selection in most cases happens on the basis of an expert assessment of the leading coaches of a performance of technical elements and the accounting of weight-growth indicators of children that doesn't open the full range of prospects of a child for the follow-up sports activity [1; 3; 9].

A revision of the training program existing for CYSS on basketball in Ukraine (in 1999) testifies that identical tests for all age groups from 12 till 17 years old are offered in a control of different parties of preparedness, differences are observed only in an assessment of indicators. Besides, the program didn't provide a control of psychological preparedness [3].

It is proved for a long time by scientists that a successful speech of a sportsman in competitions depends not only on the high level of physical, technical fitness, but also on his psychological preparedness [2; 6–8; 10]. Psychological features of competitions, regularities, reasons and dynamics of precompetitive states define high requirements to mentality of a sportsman. In total that was fulfilled and saved up in the course of a study and trainings within months or years can be lost during a sports fight. Therefore psychological preparation for competitions is an important and obligatory element of study and training [7; 9].

The organization of psychological preparation for competitions has to be directed on the formation of properties and qualities of the personality and mental states, with which always the progress and stability of the competitive activity are caused. Its purpose needs to be considered the adaptation to competitive situations, the improvement and optimization of reactivity of the display and the corresponding reaction to specific extreme conditions of the activity [2].

The success in a game is achieved by the whole complex of mental qualities which can be divided into such groups: a) psychomotor which are connected generally with the existence of opportunities precisely and to expedite quick actions in rather unambiguous situations: "I saw – I made"; b) perceptual qualities which belong to features of manifestation of mechanisms of a perception of a situation (speed of a perception of information, property of attention, volume of a field of vision); c) intellectual that define the efficiency of the solution of tactical tasks (speed and accuracy of an operational thinking, volume of a random-access memory) [2; 8].

The researches of S.E. Shutova [8] testify that the most significant role is played by the found indicator of the narrow efficiency of attention (51,9%). It is connected also by that the attention of a basketball player is directed not so much on the structure of a performance of this or that reception, how many on an assessment of a concrete game situations are and a choice of the most expedient action. As for the adoption of the rational tactical decision to a sportsman it is necessary, first of all, not only to estimate a game situation, but also to be able to concentrate at the right time attention on a minimum of the most important objects (in defense – an action of a player with a ball, in attack – an action of a defender, for the purpose of the definition of an optimum suitable way of an outgaming of a defender, etc.).

It is proved by a number of authors in the researches that the development of different parameters of attention is of rather great importance for the game activity which in turn promote more accurate course of mental processes to (feeling, perception, thinking) when performing game actions. According to the most of authors [1; 2; 7; 8], a factor of the successful tactical activity of a player is the high level of the development of attention.

Therefore the topical issue of the present is the implementation of an assessment of parameters of attention at basketball players as to a factor which defines efficiency of the competitive activity at the stage of the previous basic preparation.

Communication of the research with scientific programs, plans, subjects. The research is carried out according to the Built plan of the RW in the sphere of physical culture and sport for 2011-2015. The Ministries of education and science, youth and sport of Ukraine, by a subject: 2.6 "Theoretic-methodical bases of the improvement of the training process and the competitive activity in the structure of long-term training of sportsmen" No. of the state registration is 0111U001168.

The objective of the research: to determine attention parameters at basketball players of 13-14 years old before and after physical activity of a different orientation.

Material and methods of the research. Methods of the theoretical analysis and synthesis of references, a method of the analysis of documentary materials, pedagogical supervision, psychological testing, methods of mathematical statistics were used in the research.

Such methods were used for the determination of parameters of attention: "The mixed up lines" was used for the determination of the level of concentration, the proof test with Landoldt's rings was used for the research of accuracy and quantity of mistakes, the proof test with letters was used for the research of switching, firmness and productivity of attention [4]. The method of pulsometry was applied to the determination of intensity of physical activity.

Three teams of basketball players of 13-14 years old of the educational-training groups took part in the research. The total of the studied is 50 persons. The research was conducted on the basis of SCYSS №5 in Dnepropetrovsk.

Results of the research and their discussion. At the beginning of the research we analysed thee competitive activity of two teams during ten games of the All-Ukrainian Junior Basketball League (AUJBL).

The analysis of the competitive activity testifies that indicators had no reliable difference on average for a game ($p>0,05$). So, a large number of mistakes (2,32±0,43 on one player), losses of a ball are observed (4,41±0,45 on one player) on average for a game on group at basketball players that it is possible to explain with the slowed-down decision-making. A low percent of hit of penalty shots (35,4±2,3% for one player) is explained by the imperfection of technique and the low level of concentration of attention. Few interceptions of a ball for a game (0,28±0,05 on one player) testify that young basketball players don't get on well at defense yet, seldom risk to come for interception of a ball, have no resistant level of integrated preparedness and so forth. At this age a large number of mistakes is assumed that is connected with features of the teenage period, inconsistency of decision-making with physical actions, the unstable level of attention under the influence of emotional and physical competitive activity.

The determination of parameters of attention before loading was carried out after a registration of heart rate. Results of the research are presented in the table.

Indicators of parameters of attention at basketball players of 13-14 years old (n=50) before and after loading of a different orientation

Attention parameters	Type of loading	$\bar{X}$±m	HR
Concentration, points	before loading	3,4±0,6	67,8
	nonspecific	2,8±0,3**	118,0
	specific	2,1±0,15***	169,2
Productivity, points	before loading	11,5±1,3	67,8
	nonspecific	8,7±0,9**	118,0
	specific	8,2±0,3***	169,2
Firmness, points	before loading	5,5±0,68	67,8
	nonspecific	4,1±0,53**	118,0
	specific	3,9±0,49***	169,2
Accuracy, points	before loading	12,1±1,6	67,8
	nonspecific	8,7±1,4**	118,0
	specific	8,0±1,3***	169,2
Switchings, %	before loading	58,1±2,99	67,8
	nonspecific	65,6±3,2**	118,0
	specific	71,2±3,5***	169,2
Quantity of mistakes, times	before loading	36,9±5,67	67,8
	nonspecific	45,8±3,81**	118,0
	specific	48,9±2,80***	169,2

Note. *** – the reliability of divergences between indicators before loading and after nonspecific loading *** – the reliability of divergences between indicators after nonspecific and after specific loading.*

The analysis of parameters of attention before loading testifies that HR equals 67,8 bpm^{-1} before loading. In the group of basketball players it was revealed that such parameters of attention, as: concentration, productivity and firmness were at the low level; accuracy and switching – at the average level, the high level of mistakes is noted.

The following stage was that nonspecific loading of aerobic character was set to sportsmen after a warm-up (6-minute run on a basketball platform), then heart rate was measured and repeated testing of parameters of attention was held.

After nonspecific loading it was revealed that concentration lowered on average by 0,6 points (low level). Productivity of attention decreased by 2,8 points (low level). Accuracy lowered by 3,4 points; firmness lowered by 1,4 points; switching worsened for 7,5%. Quantity of mistakes increased on average on group on 8,9 times.

On the following training loading of specific character in aerobic anaerobically mode was set to basketball players (exercises of a technical and tactical orientation with an active counteraction of defenders, educational game) and parameters of attention were defined.

The received results testified that the influence of specific load of parameters of attention was considerable. So, concentration in comparison with results to loading lowered by 1,3 points, productivity lowered by 4,1 points; firmness worsened on 1,6 points; switching lowered by 13,1%; mistakes became on average 12 more.

Conclusions:

1. The analysis of the existing training program of CYSS on basketball of rather control standards found out that, despite of a great importance of manifestation of mental and morally strong-willed qualities as a factor which influences the progress of the competitive activity of sportsmen, the level of psychological preparedness isn't controlled, the program needs the improvement according to modern requirements of the system of preparation in sports.

2. It is found during the research which was conducted by us mainly the low level of the development of parameters of attention in basketball players at the stage of the previous basic preparation. It is certain that mainly decrease in parameters of attention is influenced by loading of specific character, indicators of concentration, switching, firmness especially go down, the quantity of mistakes increases.

Prospects of the subsequent researches consist in the improvement of the monitoring system of integrated preparedness of basketball players on the basis of factors which influence the efficiency of the competitive activity at the stage of the previous basic preparation.

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Technology of physical training of young footballers

Abstract. ***Purpose:*** *to prove the technology of physical training of young players.* ***Material and Methods:*** *pedagogical observation and analysis of literature, both in the field of football, sports physiology and in the use of technologies that protect the health of the process of physical training of young athletes.* ***Results:*** *notes the need to review approaches to the organization of long-term preparation of sportsmen. The contradiction between the increasing demand for training of young sportsmen and features of the growing organism is established.* ***Conclusion:*** *the ways of rational construction of training process on the basis of the strategy of preparation of sports reserve and health at talented youth.*
Keywords: *young footballers, health, fitness.*

Introduction. The high organizational and methodical level of sports preparation with children and teenagers defines a success of this or that country on the international sports scene in a substantial degree in the sequel (V. K. Balsevich, 1993; L. P. Matveyev, 2000; N. G. Ozolin, 2002; V. N. Platonov, 2010). In recent years the attention of experts increasingly concentrates not only on the development of technologies of training of the strongest sportsmen, but also on the further improvement of the system of preparation of sports reserves, providing the replenishment of structures of professional and national picked teams (V. G. Nikitushkin, P. V. Kvashchuk, W. G. Bauer, 2005; A. A. Suchilin, A. P. Zolotarev, M. M. Shestakov, 2005; V. Pshibylsky, 2007; V. N. Alekseyev, 2009; I. G. Maksimenko, 2010; V. P. Guba, A. V. Leksakov, 2012).

In the theory of sport the huge number of scientific data is saved up (M. Y. Nabatnikova, 1982; N. A. Fomin, V.P. Filin, 1986; V. N. Platonov, K. P. Sakhnovsky, 1988; To F. Z. Gakame, 1995; V. P. Guba, 1996; L. V. Volkov, 2002; L. P. Sergiyenko, 2004; A. A. Shamardin, 2009) which allow carrying out sports training of children and teenagers taking into account features of the development of the growing organism. These data cover not only an organism in general, but also the development of its separate systems which, anyway, suffer the influence of physical activities.

At the same time the early sports specialization and accompanying it the intense training and vigorous competitive activity are extremely dangerous, breaking objective regularities of long-term improvement, prematurely wearing out a young sportsman and depriving his opportunities to reach really good results in an optimum age zone for a concrete sport [1; 7].

The modern level of professional football is so high that the solution of the main objective of preparation of the qualified sports reserve demands the increasing specialized adaptation of a young sportsman and leaves few opportunities for the comprehensive strengthening of his physical health.

The exit from this situation seems that it is necessary to reconsider traditional views of the process of long-term sports preparation and an active participant (child) in this process so far for young football players who are engaged in the modes of intense sports training, and also when planning training and competitive loads to consider biological regularities of adaptation of bodies and systems of a child's organism, to use training influences answering to specifics of a sport to organize the monitoring system over a reaction of engaged on training loads and condition of their health.

It is represented what exactly the aim orientation on long-term training of perspective football players has to define a technological strategy of creation of the training process in Ukraine.

Communication of the research with scientific programs, plans, subjects. The research was conducted according to the Consolidating plan of the RW in the sphere of physical culture and sport for 2011-2015 of the Ministry of education and science, youth and sport on a subject 2.3 “Scientific- methodical bases of the improvement of the system of training of sportsmen in football taking into account features of the competitive activity” (state registration No is: 0111U001722).

The objective of the research: to prove the technology of physical preparation of young football players.

Material and methods of the research: analysis of special literature, system analysis, method of pedagogical supervision.

Results of the research and their discussion. The analysis of a question condition of improvement of the control system of long-term physical preparation allows making the conclusion that the modern sports pedagogics, psychology and related subjects of a medico-biological cycle saved up a considerable material on separate aspects of this problem.

At the same time it should be noted that the correct schemes in general and corresponding to the present level of our theoretic-methodical representations, knowledge, abilities, skills and methods of management of the separate parties of the process of physical and sports training didn’t develop in the finished organizational-methodical control system of the process of long-term physical preparation yet.

In many respects, as noticed fairly T. V. Mikhaylova (2009), it is caused by that circumstance that a coach has to operate successfully, but not the process of sports training, but the process of training of a sportsman.

Proceeding from this situation, we will stop on the separate approaches which define the quality and the efficiency of implementation of the long-term program of preparation of the talented youth.

First, systematic classes by football assume a successful participation of a child in the mode of intensive training and competitive activity. The last means that young football players have to correspond to certain criteria of sports suitability to sports activities. They are: state of health, standard motive qualities, coordination abilities, constitution of a body (bodybuild), mental state, and motivation [1; 4].

We will consider, first of all, a state of health which is a significant factor in the achievement of sports success of a child. It is known that one of the composed growths of sports skill of a child – is systematicity of the educational and

training activity. Children who miss trainings because of the increased incidence overtake technical elements, functional and physical preparedness, and theoretical base of the organization of sports activity in a smaller volume seize.

Proceeding from this fact that children get to football sections in 6–7 years old, the question of a state of health of a modern first grader is actual.

It is established that children of younger school age are characterized by the following problem components: chronic diseases at 15–20% of children, at 50% – violations of the musculoskeletal device, at 20–25% – nasopharynx diseases, neurotic deviations at 30–40%, at 10–23% – allergic reactions, at 10–25% – violations of activity of the cardiovascular system are revealed. The special attention is demanded by a problem of natural preservation and strengthening of immunity.

Diseases of respiratory organs – 60–70%, violations of the musculoskeletal device – 41,5%, digestive tract diseases – 18%, allergic reactions – 15–17%, mental diseases – 15% occupy the leading position in the structure of incidence of a child of younger school age. At every tenth child the underdevelopment of the informative sphere is noted at 7% – various speech disturbances. About 20% of children are ill within a year four times and more (V. A. Vishnevskiy, 2002).

Thus, the low initial level of health of children of younger school age seriously complicates their adaptation to the educational-training and the competitive activity.

It is obvious that the increased physical activity at children's and teenage age not only interfere with emergence of a functional blocking in various bodies and systems of an organism, but in certain cases even can provoke them (V. A. Kashuba, 2010).

It is established that more than 70% of young sportsmen have various violations in a state of health by 16–17 years which part is the main reason for the premature termination of sports activities (Yu. V. Orlovskaya, 2000).

Therefore, a coach has to make constantly changes to the educational and training plan, consider dynamics of the development of theoretical and practical material during the organization of the pedagogical process, and above all recognizing that young football players are engaged in the mode of intense sports training, to carry out control of the reactions constantly which are engaged on training loads.

Secondly, the traditional system of training of a sportsman is based on that a human body will construct itself, only perform correctly necessary motive tasks. And still a large number of the modern scientific works devoted to football, and sport in general proceeds from the view of a person which was outdate on incompleteness, as on a callous biological education.

At the same time training of a sportsman has to be considered as training first of all of his mentality on a management of a body and exchange processes in it, and a development of standard motive qualities or training in movement skills and abilities is a formation of mental programs for management of an organism.

From here the whole programming of the training process has to be based on the fundamental provision on a mentality priority as the initial conscious or the unconscious operating beginning of all practical activities of a person (I. M. Sechenov, 1863; N. E. Vvedenskyi, 1950; I. P. Pavlov, 1954; A. A. Ukhtomskyi, 1966; D. N. Uznadze, 1966, etc.). A body of a person without the management of a brain in movements isn't independent at all. All adaptive changes in a human body happen at the level of mentality in the beginning, and it defines the mechanism of regulation of adaptive processes of the achievement of adequate requirements of sports loading. And whether they will happen, and whether at the sufficient level, from the deepest exchange to shown behavioral, everything depends on mentality of a specific person because his mentality defines and operates any changes in a human body.

Preceding from it that, it is necessary to interact with his mentality, but not with a physical body to teach a young football player to something. From here it is necessary to focus attention on a muscle work through understanding of that muscles execute the commands which are sent by a brain. Muscles aren't capable to study, unlike a brain. It is incorrect to argue that players will play better if they increase the volume of lungs or it is better to play by a head if force of muscles of feet increases. It isn't necessary to simplify football to the level of physical activity, and *it is necessary to concentrate attention on the solution of motive tasks in the course of game in football* to learn to play football at the good level [12–14].

In this regard, considering structural features of functional preparedness of children, sequence of changes under the influence of purposeful physical activities, it should be noted that a live organism is the difficult system counteracting the environment and changing under its influence by the activation of adaptable mechanisms. The organism to the same ultimate motive goal can come in the different ways, using a set of the same responses (H. A. Bernstein, 1991).

A coach is interested in athletic ability of a child, and, so generally the structure of his motive device and the system of regulation of movements. The assessment of a condition of these systems is carried out by means of test exercises – the exercises which aren't demanding a special movement skill and ability. Not standard motive qualities of a child, and standard motive qualities plus the acquired skill in a performance of this physical action and individual abilities will be estimated otherwise that is inadmissible in most cases (V. P. Guba, 2009; V. N. Seluyanov, 2010).

We will remind that the human body represents the difficult motive system having 244 degrees of freedom from the point of view of biomechanics of the motive device. The top and lower extremities have on 30 degrees of freedom. It is clear that the system with such number of freedoms can carry out the same task, carrying out the movement on significantly differing trajectories. Therefore, the constant control over the working muscles is necessary when performing the movement as any motive impulses to muscles, as if they would were, can't provide movement accuracy in itself. Its continuous correction on all amplitude of the movement is necessary for the performance of the set movement with a big accuracy. This correction is carried out by the muscles getting into gear on a receipt measure in information brain from periphery about the course of performance of the set movement. Nervous devices (receptors) which are "taken out" on periphery – in joints, muscles, sinews carry out tracking the movement. So-called "proprioceptive impulses" go to a brain from these receptors, and it corrects the movement by an inclusion of auxiliary muscles or the strengthening work of antagonists.

Thus, a movement skill in simple and difficult movements can't be a simple motive stamp as the conditioned reflex

can't be a simple print in the motive centers of a brain. It is the difficult constantly changing process. A movement skill is not a formula of a movement, and the more so is not a formula of the muscular tension imprinted in the motive center. A movement skill is the mastered ability to solve this or that type of a motive task (H. A. Bernstein, 1991). Now it is clear to execute some movement correctly, it is necessary to pass hundreds of times a way of the motive act that the sensitive centers could "experience" all possible deviations when performing this movement.

From here, if a player knows how to solve game situations, his brain will adequately operate muscles. The more experience of a player is in the solution of situational tasks, the quicker he makes the right decision. Therefore the problem of physical preparation – is the improvement of quality of a game in football.

As the famous German expert in the field of children's football Horst Wein noticed fairly (2007): "A beautiful game is football which begins in a head and comes to the end in feet".

The honored coach of Ukraine P. A. Ponomarenko is solidary with such position (1994): "A playing boy has to be the purpose of the training process". Further the author, proceeding from the practical experience, notes that there shouldn't be small, average, big loadings in the educational and training program since classes are given not with the qualified sportsmen, and with children who should learn to be played. From here the important principle of work with young football players: everything does everyone on the optimum mode of individual opportunities, on the verge of high, but surmountable difficulty. Any motive tasks on a place – is to do everything in the movement, at speed. Any additional loadings with a bar, weights, on racetracks – is to give all classes on a football field (platform) and it is as much as possible – in game conditions. It will be quite enough for young talents of it to develop harmoniously, without scoliosis, lordosis and kyphosis, without pathologies of all systems of an organism, taking into account a day regimen, age features, basic physical and game data. Each motive task, action has to be proved, thought over. A player has to know why it is necessary to carry out this or that action, why this task, but not another and what advantage from it.

The Dutch expert R. Verheyen [2] who, speaking about physical training of young players adheres to a similar view, reminded one of the main principles of the offered technique which is as follows: "Playing football – you improve a physical state. The higher the level of a football player is, the quicker level of his working capacity passes the process of restoration between actions". Further he emphasized the importance of football sprint and training bilateral games in the reduced structures and on small game space. Having noticed that "… the training process has to comprise a game essence. In what sense to run 400 meters or to reel up circles round a field? It is related to football directly, isn't it? Coaches need to project a situation from a game".

The next moment – is the existence of a contradiction between the competitive and training activity in children's football.

The existing practice of the organization of competitions for children and young people provides holding the regular championships, since nine-year age. Thus, children from the early age are compelled to play as well as adults, with emphasis on result that interferes with their natural development. It should be noted that children participated in various competitions 40-50 years ago, only the result in them carried more often the abstract value associated actually with a game which gives joy and pleasure.

Therefore when the result is regarded as of paramount importance, the basic principles and regularities of creation of the training process at stages of long-term preparation are broken thereby, and as a result – is an imbalance between the level of preparedness of young football players and requirements of professional football [1; 11].

Thus, the aiming on "victory at any cost" assumes, first of all, speeding up of the training process, with emphasis on physical preparation, and, as a result, it leads to a premature exhaustion of a child's organism, an exacerbation of diseases and traumatism, and also to a restriction of technical and tactical potential of young football players (D. J. Smith, 2003; T. Reilly, D. Richardson, G. Stratton, 2004; B. G. Chirva, 2008; T. Turner, 2009; V. V. Nikoyenko, 2010).

It should be noted that most of domestic coaches has a narrowing of a sphere of application of their professional qualities. In practice the management of sports activity of young football players is reduced to the management of sports preparation today. In other words, the main attention is paid to the directly training process, first of all planning, dispensing, control of training loads which contents is caused by an aspiration to the achievement of momentary sports results. It isn't surprising that the system of functioning of football for children and young people is under construction on the principles of "a turned pyramid" long ago: when the number of pupils of sports schools and clubs steadily decreases by a "rejection" of less perspective children from a stage to a preparation stage who can't show, according to managers and coaches, the good level of preparedness and sports skill. Therefore the whole system of football for children and young people, since a stage of the initial preparation, is considered not as the system of long-term preparation urged to provide requirements and forward development of each teenager for sports improvement and as an instrument for ensuring of needs of professional football.

At the same time it is established that the system of competitions has to be subordinated to the system of preparation from the moment of the beginning of systematic sports activities and before a hit in elite sport [7].

In this regard it is necessary to make changes to the existing practice of the organization and carrying out children's competitions for the high-quality preparation and the forward development of talented football youth [5].

Relatively a successful formation of the initial level of physical fitness of young football players in long-term training it is necessary to consider known age features of a children's organism and border of the sensitive periods in the age dynamics of standard motive qualities (B. G. Chirva, 1998; Yu. F. Kuramshin, 2006; V. K. Balsevich, 2009).

Meanwhile, as for training of young football players, its present organization will be coordinated a little with regularities of the development of physical potential of a child. In particular, the existing methods of the organization and definition of the content of sports training don't consider the data about the sensitive perception of training and training influences from various functional systems of a sportsman. In view of that these influences happen in the conditions of the processes of adaptation to physical and psychological activities of different character, volume and intensity developing in his organism.

In this regard uncertainties arise at an assessment of their impacts on operational, current and future state of a trained sportsman.

It is really difficult to imagine to himself coincidence of the training programs and plans defining the contents, volumes and intensity of these influences even if the most ingenious on quality of anticipation of the dynamics of conditions of a young sportsman, with a rhythm of formation of sensitive perception of these influences [1].

The necessity of overcoming of this contradiction, we will emphasize once again, causes carrying out the continuous control by a coach over a condition of the developing and developed standard motive qualities, abilities, morpho-functional and others, connected with realization of motive function, systems of an organism of a young football player [6].

In the pedagogical sense such control will provide a positive evolution of motive abilities, adequacy of physical actions to requirements of the efficiency of competitive practice and maintenance of parameters of homeostasis in the modes of preservation of the reserves which are necessary for normal activity, and also continuous correction of volumes, intensity, forms of the training influences directed on the achievement of long-term goals of training of young football players.

At such approach both volumes, and intensity, and contents, and orientations of the training influences are caused by the real processes proceeding in an organism of the engaged, flexibly adjustable be a coach and a sportsman, but not by thought up kilometers, kilograms and tons of the expecting rises of burdening, number of approaches and repeatedly, variably or interval the overcome pieces of competitive distances with frightening and often plainly in not explained figures for micro, macro - and mesocycles of sports preparation [1].

Concerning chronology of the formation of motive abilities, it is necessary to pay attention to the sequence of their development [4]: high-speed, high-speed and power abilities, high-speed and power endurance, power, general endurance (flexibility accompanies the development of all abilities).

Other picture of the implementation of the educational-training process is observed sometimes in practice of child's football: the development of high-speed and high-speed and power endurance, and then actually speed that creates barriers to the subsequent competitive realization of a child.

It is necessary for a coach to consider that an adaptation of a child has to go, first of all, not to the competitive sizes of a game field, and to the competitive modes and it is desirable to limit these competitive modes in space and in time in the development of standard motive qualities [3; 4].

For example, if a young football player trains on a big football field, he has instead of speed which is shown high-speed endurance develops at rate of movements, respectively and a different way of power ensuring activity.

It is separately necessary to stop on a question which often arises at coaches: what it is better to develop – strong or weaknesses sides at a sportsman? Regard there was a clear idea in this that the main strategy in training has to be not the smoothing of identity, and, on the contrary, the development of strengths of an organism and the identity of a sportsman as the leading condition of achievement of good results by him (V. V. Kuznetsov, 1984; J. Bangsbo, 2000; D. Tumility, 2000; J. G. Pereira, 2001; I. N. Solopov, A. I. Shamardin, 2003; W. Pzybylski, 2006; V. N. Platonov, 2013).

In particular, it was established that "pulling up" of the lagging behind standard motive qualities leads to harmonious physical development of children, sometimes without improving results in the chosen sport. The increase of initial level of indicators of the leading standard motive quality promotes the growth of sports skill in the sports connected with manifestation of one, leading ability – qualities (speeds, forces, endurance etc.); simultaneous development of the leader and the lagging behind standard motive qualities leads to the increase of sports results in game sports where emphasis is placed on the simultaneous performance of several physical actions or abilities differing on the structure of performance (V. P. Guba, 1997; V. E. Dayev, 2007; A. I. Ibriyev, 2009).

When forming and training in motive abilities it is necessary either to develop the leading standard motive quality (a sports orientation), or "to tighten" the lagging behind qualities (an improving orientation) for the achievement of the best result (V. P. Guba, 1997; S.Yu. Tyulenkov, 2007; I. G. Maksimenko, 2010).

It is necessary in the training process with young football players:

- to use the motive tasks aimed at the development of certain standard abilities which are related to a real game;
- to improve the standard abilities conducting for a player;
- to create such structure of physical fitness in which all components are proportional (M. Y. Nabatnikova, 1982; M. Dzhazzan, 1991; F. S. Vargas, 1993; V.P. Filin, 1995; V. Pshibylski, 2004).

It is necessary to understand such level of the development of separate standard motive qualities and such their ratio which allows a sportsman to realize the potential most successfully which is saved up in training classes as an optimum structure of physical fitness of a football player and to achieve stable sports results [8].

The next aspect. It is known that the close attention at all stages of the system of long-term improvement of football players has to be paid to physical preparation. And the approaches to its realization differ significantly in comparison with other parties of football skill.

When the speech comes about the development of standard motive qualities of football players, usually it associates with tired muscles, run, an increased body temperature, plentiful sweating, breakthroughs, and classes in a gym – activity which is directed on the increase of sports results.

Thus the training process usually is based so that loading in motive tasks was higher than that for which players are usually adapted.

At the same time the choice of the used training means has to be based that a game in football is not only endurance, force, speed, technical skills, mental qualities etc. These factors tell nothing the mere facts about football abilities of players. It is important how a football player reacts to various game situations and how he solves them. It is the main *criterion of an assessment of skill in football* [9; 15].

It is clear that the realization of this aspect of preparation borrows much more time, than the increase in a muscle bulk, spring ability or volume of lungs. Therefore results in Cooper's run and on 30 meters will tell nothing about it [13].

The assessment of the level of physical fitness of a football player needs to be carried out taking into account the efficiency of his actions in a game. For an example:

- ability to solve problems quickly, during a long period, in the conditions of an active opposition of the rival and the audience;
- ability to put pressure, play extraordinary, quickly to pass from defense to attack and to a turn etc.

A children's coach surely has to know bases of physical preparation, it is correct to select training means, taking into account individual opportunities of a children's organism which are reduced, first of all, to creation of such game situations which will stimulate players to carry out actions better, more often, or quicker (tab.). The quality of a game is based on constantly increasing complexity performance of motive tasks. It is necessary "to throw down" a challenge to players which they have to accept with hunting. The assessment of efficiency of such tasks will not consist in indicators of HR, the overcome distance, kilograms or minutes, and in ability of a player to carry out an objective [15].

Means of regulation of an orientation of a training load [10]

Means	Effect
Reduction of the size of a game space	Less time for decision-making in a certain game situation
Increase in the size of a game space	More time, longer distances for run and a pass
More rivals	Less time, more difficult "to read" a game
Less rivals	More time, easier "to read" a game
Pressure of the rival	Less time, more difficult "to read" a game
Situation use "off side"	Less the space, less time
Enough balls outside a game field	Continuous game
To kick balls into the goal only by a head	Game through flanks and a lot of game by a head
Restriction of time (to play only 5 min. or the last minute)	Players are compelled to attack, fight for a ball more effectively, to control a ball etc.

S. K. Sarsaniya and V. N. Seluyanov came to the same conclusion (1991) who established that average HR isn't a criterion of the efficiency of the game activity. If the growth of HR is connected with a performance of game actions – the accelerations which are carried out with the maximum intensity and useful to a team in general, it is possible to recognize such growth of pulse effective. In case of the growth of pulse as a result of run across the field with low intensity, at total absence of actions, useful to a game, – it is impossible to recognize the growth of pulse effective, and intensity of loading is high.

Concerning HR indicators, the practical of physical training of football players is often under construction taking into account reaction of the cardiovascular system to the performed motive tasks or the competitive activity (J. Bangsbo, 1994; B. Ekblom, 1994; M. A. Godik, 2006).

In this case it is supposed that it is necessary to determine the power of aerobic and anaerobic thresholds in a cyclic task in the form of run. Heart rate is also defined for these thresholds. Further the assumption becomes that it is possible to determine the power supply mode by a pulse. If a work is performed to an aerobic threshold, loading has an aerobic focus. If a work is performed with HR above an aerobic threshold, but below HR of an anaerobic threshold, loading belongs to the mixed. Loading has a glycolytic focus at HR above AnT. Such classification of loadings is widely applied in cyclic sports, but legitimacy of its application in acyclic sports, in sports didn't receive a convincing justification

(K. S. Sarsaniya, 2003; V. N. Seluyanov, K. S. Sarsaniya, V. A. Zaborov, 2012).

In football the same average HR can be registered at different forms of performance of the competitive activity. For example, a player can carry out run with the maximum speed on a piece of 10-20 m and with an interval 30–45 s to repeat fast run. In this case average heart rate makes 130–160 bpm^{-1}. If to increase piece length to 50–80 m, to reduce intensity a little and to increase a rest interval till 60-90 s, we will receive the same heart rate. When performing uniform run with HR at the level of aerobic or anaerobic thresholds it is possible to record the same HR. We will notice, however, that the physiological effect will be various. In the first case when run is carried out with the maximum speed, all muscle fibers get into gear, in general muscles are a little acidified therefore there is a considerable gain of aerobic and high-speed and power abilities. In case of run at the level of an aerobic threshold the training effect is equal to zero as only oxidizing muscle fibers are recruited, about 1/3 from their total number, and these Mf are already developed to a limit (a limit ratio between weight myofibrils and mitochondrions).

Thus, it is incorrect to classify loadings by a pulse. It is reasonable to register a pulse only with one purpose – to record the extent of influence of load of a myocardium (V. N. Seluyanov, S. K. Sarsaniya, K. S. Sarsaniya, 2003).

It is established that a performance of loadings with HR is more than 180 bpm^{-1} and lasting more than 30 s, as well as a participation in several games in a week, provoke an emergence of "defect of diastole" in a myocardium at young sportsmen (Sonia Maria Bordin, 1999; W. F. Helsen, N. J. Hodges, J. Van Winckel, 2000; S. D. Yefimov, 2011).

It is possible to add the widespread in football practice of use of "squares", as means of special physical preparation to it (M. A. Godik, 2006). At their application even once a week, it will lead to the dystrophic phenomena in myocardium (F. S. Meyerson, M. G. Pshennikova, 1988), to the decrease in aerobic opportunities, to the increase in probability of traumatizing muscles in connection with the deterioration of their ability to relaxation in 1–2 months of regular trainings (to

P. V. Komi, 1984; P. D. Gollnick, 1986; H. Hoppeler, 1986).

Especially attentively it is necessary to approach this question when planning loadings during pubertal or post-pubertal physical development of teenagers when children have the development of the cardiovascular system and, first of all myocardium, lags behind the development of the musculoskeletal device (F. S. Meerson, M. G. Pshennikova, 1988); L. Capranica et al., 2001).

It should be noted; despite of the position of V. N. Seluyanov with co-authors (2003), still among experts of football there is no consensus, on the basis of what indicators it is necessary to exercise control and planning of training loads. It is explained by that the majority of motive tasks in games have a complex character, that is they improve standard motive qualities and technical and tactical skills of sportsmen at the same time (G. A. Goldenko, 1984; S. N. Shikhverdiyev, 1992; V. Pshibilski, 1998; N. N. Ermakov, 2003; M. A. Godik, A. P. Skorodumova, 2010).

For these purposes as M. A. Godik, A. P. Skorodumova (2010) notes, indicators of time for certain types of preparation, however the majority of the means, which are applied in the training use, don't possess a pronounced influence (J. A. Morcillo, O. Cano, D. Martнnez, 2006). Therefore, it is very difficult to estimate correctly an orientation of training classes and tasks.

Therefore in the circumstances it is seed expedient to plan and control training loads on their primary orientation taking into account power supply mechanisms which are divided on: anaerobic (alactatic and glycolytic), aerobic-anaerobic and aerobic (N. I. Volkov with co-authors, 2000; M. A. Godik, 2010; E. D. Nistratov, 2011; V. D. Sonkin, R. V. Tambovtseva, 2011; F. A. Iordanskaya, 2013).

Such way, first, allows with a necessary accuracy to define the extent of influence of this or that load of organism of sportsmen and by that to lower factors of emergence of conditions of overfatigue and overstrain, and furthermore overtraining that in turn allows operating by the fitness development effectively, secondly, on the basis of the systematization of motive tasks to unify the accounting of work on indicators of the time of the influence of motive tasks of a certain orientation (G. S. Lalakov, 2000; V. V. Varyushin, 2007).

Conclusions. Recently the radical changes are observed in the technique of sports preparation, which are connected with the increased competition at the international competitions and promotion into the forefront of training programs, the performance of which often exceeds the adaptation opportunities of a human body. This problem gains a special sharpness at stages of long-term training of football players when reserves of their organism are intensively spent for the natural growth and development, and also for power and plastic providing of the set loadings. The provision of business is aggravated with an early specialization, intensification of training and competitive loads and their negative influence on the child's organism. There is a contradiction between the increasing requirements to preparedness of young sportsmen which are dictated by need of the continuous increase of results, and limited functionality of their growing organism.

Proceeding from the consideration of some aspects of the increase of efficiency of the process of physical preparation, we will note one of them that a dynamic planning of the training loadings "from a state", "from the different vectorial compared and analyzed data of the continuous control" and "from data of the permanently corrected forecast of the development of sports preparedness" is the basic condition of minimization of pedagogical mistakes and the prevention of inadequate accelerations, delays or stagnation in the development of the balanced structure of physical fitness of the young football player.

We will emphasize that a coach-thinker-teacher-tutor remains a key figure in the solution of the designated approaches who is capable of the responsible and weighed independent judgments, owning by own strategy of the organization of the training process, using health forming and health saving technologies of preparation, the active consumer of versatile scientific information, the shrewd psychologist and the manager who is counting prospects of sports career and education of pupils.

Prospects of the subsequent researches. The received results of researches will be the basis for the development of the training program and the methodical management for coaches of football sports schools, clubs and academies.

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Technology of wellness aerobics in the structure of personality-oriented program of physical rehabilitation of women with postmastectomy syndrome

Abstract. ***Purpose:*** *to develop and substantiate technology of wellness aerobics in the structure of personality-oriented program of physical rehabilitation of women with postmastectomy syndrome on the dispensary stage of rehabilitation.* ***Material and methods****: theoretical analysis and compilation of scientific and methodical literature and internet providers; induction and comparison. The study involved 115 women with postmastectomy syndrome on the dispensary stage of rehabilitation.* ***Results:*** *the developed program of wellness aerobics includes elements of basic aerobics, fitball aerobics, step-aerobics, strength training and stretching and their rational combination, which was implemented in accordance with the adaptation and training period of follow steps. Customization means of wellness aerobics depended on cardiorespiratory disorders, autonomic systems, limiting range of motion of the shoulder joint, degree of lymphostasis of women with postmastectomy syndrome.*

Keywords: *wellness aerobics, program, rehabilitation, women postmastectomy syndrome.*

Introduction. Leading literary sources [4, 6] indicate that breast cancer takes a leading place among the female population. The most common consequence of breast cancer is postmastektomy syndrome (PMES), which includes the manifestation of symptoms such as upper limb lymphostasis, limiting range of motion in the shoulder joint, sensory disturbances, cardiovascular and respiratory systems, quality of life, negative psycho-emotional effects, etc. [2, 3, 4].

In most developed countries the use of physical rehabilitation is an integral component of restoring functional and emotional state of women with postmastektomy syndrome at all stages of treatment [5, 7, 8].

Analysis and synthesis of scientific sources suggests that the use of aerobic [7, 8] and power [5] burden contribute to the improvement of some biomarkers related to cancer prognosis, quality of life, decrease of arthralgia, fatigue, lymphostasis, neuropathy, osteoporosis in women with PMES.

However, the theoretical analysis of scientific papers showed that the problem of physical rehabilitation of women with postmastektomy syndrome almost solved, and existing programs of physical rehabilitation of this group do not include the functionality of the cardiovascular system of women, individual preferences for choosing personality-oriented programs, differentiation of modes of physical activity that requires the development and scientific substantiation.

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).

Objective: to develop and substantiate technology of wellness aerobics in the structure of personality-oriented program of physical rehabilitation of women with postmastectomy syndrome on the dispensary stage of rehabilitation.

Material and methods: theoretical analysis and synthesis of scientific literature and global information of the Internet; induction and comparison. The study was conducted at the Zaporozhye Regional Oncology Center and Sports Complex "Spartac". The experiment involved 115 women with postmastectomy syndrome, the average age of the studied was 60,27±0,79 years. These women underwent modified radical mastectomy for Madden and had 1^{st}-2^{nd} stages of tumor development. In the clinical stage of rehabilitation of women according to their own desires and rewards was offered to choose the program of physical rehabilitation under which they will work during the year. Previously women were interviewed in the course of which were given a clear explanation of the features of each of these classes.

Results and discussion. The developed personality-oriented program of physical rehabilitation takes into account the preferences of women and included: akvafitnes, conditioned swimming, basic elements of aerobics, fitball, gymnastics, step aerobics. Overall clinical rehabilitation stage consisted of two periods: adaptation (3 months) and training (9 months).

Implementation of personality-oriented program included classes in the gym and the pool three times a week. Within each class women engaged in the gym and in the pool for one hour. The content of program, intensity and duration of the training depended on the level of the functional state of the cardiovascular system (LFS) of women and regularly adjusted according to the results of the current control its level. For the convenience of the program the women were divided into subgroups according to their level of physical condition (low, average and below average).

The application of personality-oriented program of physical rehabilitation includes the integration of the basic provisions to get a positive effect of lessons: rational combination of various direction exercises; compliance with optimal intensity and duration of exercise; account comorbidities, the dosage of exercises, individualization of exercises depending on the physical condition; variation in the content of the complex.

Diagram of the structure and contents of wellness aerobics for women with different levels of physical condition shown in Fig. 1.

According to each stage of rehabilitation and functional status, biomechanical structure of movements and their especially effects, aerobic exercise were divided into exercises with unstressed, low, medium and high impact load.

The program of physical rehabilitation of women with low LFS. To improve the functionality of female health program was developed in accordance with the LFS, individual manifestations of postmastektomy syndrome. The main structural elements of wellness aerobics for women with postmastektomy syndrome were: Duration, intensity of load, the level of shock effects, use of items (Fig. 1).

For patients of this level were doing exercises of low coordination complexity and unstressed load. During aerobic

exercise focused on character of limit movements of hands (not above the shoulder girdle), because greater amplitude requires an additional load on the cardiovascular system.

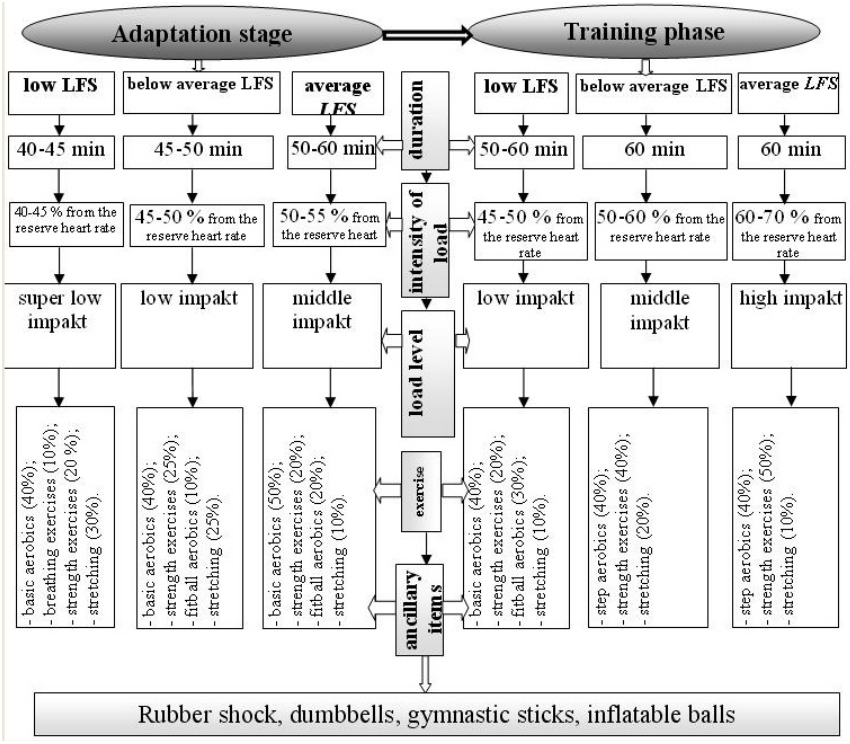

Fig. 1. Diagram of the structure and contents of wellness aerobics for women with different levels of physical condition on the dispensary stage of rehabilitation

Aerobic part of simple basic exercises included: march, step touch, step line, V-step, open step, pivot turn, toe touch, heel touch, mambo, cross step, grape vine, knee up, which were learning in the following sequence, because they related to a low impact load. The choice of these exercises was due, above all, a broad ability to modify their biomechanical structure for optimal load on the body.

Variability of load adjusted through the work of hand movements, changes of its amplitude, level of shock impact, that allowed not to change the overall appearance of choreographic picture blocks and communication. However, the women with low physical condition were doing aerobic exercises with mainly low and medium (limited) amplitude of hands movements.

Low amplitude of hands movements included: biceps curl, low row, low pinch; triceps press back, side lateral rises, front shoulder rises, shoulder punch, double side out, L-side.

Learning of all the basic steps performed in sequence: the repetition of a single exercise, series connection of different exercises, combining multiple series in combination, a combination of complex combinations. During training exercises and individual batches used combinations of the following methods: linear progression, from “head to tail”, “zigzag” and block method [1].

For the facilitate the mastering certain combinations used active pauses between them lasting 15-20 seconds, which included performance light vibrational motions of the upper extremity in conjunction with the march in place, which also contributed to the further outflow of lymph and relieve tension. Pursuant to the basic steps series combination was given to 40% of the total time of training for women with low physical condition. Most of the exercises of power type (20%) carried out in the parterre part of aerobic classes after that allowed the most isolated muscle groups that were not participating in the work and focused on working.

Among patients of this level strength training exercises were widely used to overcoming the weight of their own body and external resistance – with dumbbells.

The program of physical rehabilitation of women with below average LFS. The program of aerobics for women with below average physical condition on adaptation phase included: basic aerobics – 40%, strength exercises with weights – 25%, fitball aerobics –10%, stretching – 25%; training phase included step aerobics – 40%, strength exercises with weighting – 40% and stretching – 20% of the total lesson time.

The distribution of funds provided differentiated use of low (low impact) on adaptation and middle (middle impact) loads – at the training stage, the intensity of training – 45-50% and 50-60% of heart rate reserve to respective stages.

The section of exercises with low load included: steps (march, walking, step touch, basic Step, V-step, mambo, cross), exercise with a change of direction (step line, grape wine, cha-cha-cha), that were based on turns (turn, pivot turn, rivers); with an average load – exercises, that were based on downs legs in different directions (kick-front, kick-side, kick-back); bending the legs at the hip and knee joints (knee up, leg curl, squat, lunge, skip, low kick), accompanied by hand movements of middle and high amplitude.

There was a fitball gymnastics in the parterre part of training. During the fitball gymnastics we trained women to

maintain balance in different initial positions on the ball: sitting, lying down, lying on their back and then moved to the exercise of these positions.

Exercises using fitball as support contributed to improving the effective power capacity by unstable initial position, which required maximum mobilization of different muscle groups. Stretching included extension of certain muscle groups, did not allow any sudden movements and minimize the power load on the parts of the body, that participated in the maintenance of posture by moving the common center of mass.

The program of physical rehabilitation of women with an average *LFS*. The program of aerobics for women with an average *LFS* consisted of: basic aerobics – 50%, strength training with weighting – 20%, fitball gymnastics – 20%, stretching – 10% of the total lesson time, the intensity of load – 50-55% of heart rate reserve, duration – 50-60 minutes. The training sessions included the following components: step aerobics – 40%, strength exercises with weighting – 50%, stretching – 10%, the intensity of load – 60-70% of heart rate reserve, duration – 60 minutes.

Basic aerobics included using of different exercises of medium and high intensity (running with movements, lunges, skips, jumps with the change of position of the feet), which necessarily accompanied by active rest between series.

The duration of the sessions of step aerobics in the training phase was about 25 minutes, after that woman did strength exercises using dumbbells about 30 minutes, stretching was performed in the end of the session for five minutes. Started lessons with step height of no more than 10 cm, and then as adapting gradually increased to 20 cm. Step-platform applied not only to increase the reserve cardiorespiratory system, but for strength training.

Load of step aerobics classes varied depending on the chosen platform height, pace and complexity of movements, number of hops, using of weights.

Conclusions. The developed technology of wellness aerobics on clinical stage of rehabilitation for women with postmastektomy syndrome based on the peculiarities of physical, functional and emotional state, personality orientations of patient and contained the following components: the duration and intensity of exercises, number of repetitions of exercises, level of the functional state, individual characteristics of manifestations of postmastektomy syndrome.

Prospects for further research include the development of yoga therapy program in the structure of personality-oriented program of physical rehabilitation of women with postmastektomy syndrome.

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The structure of population life quality

Abstract. ***Purpose****: to formate the conceptual life quality model that defines the basic components of human well-being.* ***Material and Methods:*** *theoretical analysis, scientific and methodical literaturedata generalization, sociological and statistical methods. The 300 youth respondents, 98 adults of first mature age, 290 adults of second mature age and 150 elderly people were surveyed.* ***Results****: objective and subjective component was selected in life quality; the basic components of life quality were identified.* ***Conclusions****: physical component, psychological component, social activity, material component, development and identity, environment are the basic components of quality of life.*
Keywords: *quality of life, health, model, population.*

Introduction. For today an interest of a question of duration of healthy life avoids a usual analysis of mortality, incidence reasons, and is directed on studying of wellbeing of the population. Right a high quality of human life – is the main indicator of efficiency of the latest improving technologies.

For the last 15 years the quality of life became an integral part of popular and epidemiological researches and found the appendix during monitoring of health of the population, an estimation of efficiency of treatment, rehabilitation, palliative care. However, despite of that the quality of life was and remains the main object of researches in different areas of science, for today there is no only approach to interpretation of this concept.

The quality of life – is complex concept which is in the process of the development which is used actively in different branches of science [1; 2; 4; 8–10]. This term is borrowed and transferred from English-speaking literature. It is noted in the oxford dictionary of English (Oxford English Dictionary) that the quality of life is a measure of health, comfort and happiness that a person or a group of persons feel. The World Health Organization outlines this phenomenon as a perception a person of himself in life in the context of culture and system of values, depending on own purposes, expectations and standards [10]; D. Felse and J. Perry consider that wellbeing unites objective indicators and a value judgment of a physical, material, social and emotional state, according to a level of the development of an individual and his personal values [3].

The quality of life – is difficult, multi-component structure therefore a necessary element in knowledge of this phenomenon, establishment of the main components and communications, between them is the formation of a model which will contain the main components of wellbeing of a person.

Communication of the research with scientific programs, plans, subjects. The chosen direction of the research answers the basic scientific research of Lvov state university of physical culture "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: formation of the conceptual model of quality of life which defines basic components of wellbeing of the person.

Material and methods of the research. The theoretical analysis and synthesis of data of scientific and methodical literature is carried out, sociological and statistical methods are used.

The structure and components of such estimating systems is in details analyzed: CHQ (Questionnaire "Child Health"), CHIP-CE (Child Health and Illness Profile – Child Edition), CHRI (Child health rating inventories), HSMC (Health Status Measure for Children RAND, RAND), HAY ("How Are You"), PEDSQL (The questionnaire "Quality of life of a child", Pediatric Quality of Life Inventory), QOLQA (Questionnaire "Quality of Life for Adolescents"), SIP (Sickness Impact Profile), HIE (Health Insurance Experiment surveys), NHP (Nottingham Health Profile), QLI (Quality of Life Index), DUKE (Duke Health Profile), MOS FWBP (MOS Functioning and Well-being Profile), MOS Sf-36 (MOS "Functioning and Well-being Profile Short Form 36",), EUROQOL (European Quality of Life Index), Sf-6d ("A short form for estimation of health – 6d", Sf-36 Utility Index), BSQ (Brief Screening Questionnaire), GPSS (Geriatric Postal Screening Questionnaire), GSQ (Geriatric Screening Questionnaire), QOLPSV (Quality of Life Profile – Seniors Version).

Respondents of youthful age took part in the questioning (students of the different directions of study, N=300, 18,2±0,81 years), the first and second mature age (teachers of comprehensive institutions, N=98, in 30,4±1,2 and N=290, in 40,5±0,79), advanced years (listeners of University of the third age, N=150, in 65,3±0,94).

The correlation analysis was carried out according to Spearmen; carried out an inspection of the importance of the received coefficients.

Results of the research and their discussion. The analysis of definitions, these sociological surveys which are conducted in the different countries of the world, the existing methodological approaches to the estimation of wellbeing allows allocating three separate parts in quantity of life:

1) subjective that finds an individual assessment and satisfaction with own existence;

2) existential which allows defining usefulness and harmony of human life, feature of growth and development of an individual, according to spiritual and religious ideals;

3) objective which outlines a perception of quality of life taking into account factors of the outside world, adaptation of the individual to system of the existing cultural values that, in particular, is shown in the form of a material state or the social status.

Objective conditions and factors can be observed and measured definitely, and the subjective component is displayed in a type of personal judgments and answers of interested persons.

The allocation of an objective and subjective component and the use of the best strategy of each of these approaches

(tab. 1) are useful at introduction and realization of monitoring of different level, formation of bases of standard data, estimations of quality of life of the certain individual and the population, in general. By the similar principle the system EUROMODULE which combines objective living conditions, subjective wellbeing, perception of quality of life, at the level of the certain individual and society functions. Objective indicators of EUROMODULE were chosen according to recommendations of the Program of development of the Organization of economic cooperation and development.

Table 1

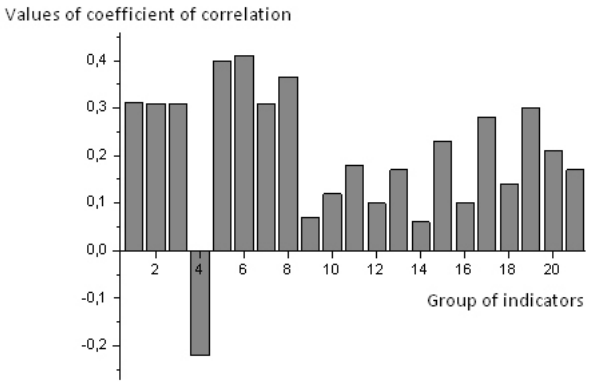
The quality system of life (on the example of the project EUROMODULE)

Level at which measurements were carried out	Indicators	
	Objective	Subjective
Individual	Dwelling, structure of a family, relation with people around, incomes, a state of health, education and job, environment and safety	Satisfaction living conditions, life, feeling of happiness, uneasiness and anomy, value of different components of life, relation (optimistic, pessimistic) to vital problems, estimation of own living conditions
Society	Social and economic situation, distribution of material resources, internal gross product	Existence of conflicts, trust to another, achievement of the different public benefits (freedom, safety, social justice), comparisons of living conditions in the country with other European states, prerequisites for social integration between persons of different social classes

A number of objective indicators is captured, in particular, the characteristic of conditions of dwelling, income, a living wage, educational services, a state of health and so forth. The main subjective indicators of this system is: the satisfaction living conditions, life, feeling of happiness, uneasiness and an anomy, the relation (optimistic, pessimistic) to vital problems, existence of the conflicts and so on. The assumption is key in this system that the satisfaction of basic requirements will define the structure of a family, relations with people around, income, a state of health, welfare of the population.

It is possible to consider approach of the system KIDSCREEN alternative which considers a holistic model of health with the corresponding allocation of a physical, psychological, social and material component [2]. The quality of life in this system is studied according to separate indicators: physical and mental wellbeing, mood and emotions, perception, autonomy, relations with parents, social support and coevals, social perception, the school environment, financial resources.

It should be noted that, despite of a weak communication between separate parameters of a subjective and objective component, they are necessary for the full characteristic of the quality of life (pic. 1). Correlation coefficients, average and insignificant behind size between a value judgment of the quality of life are found both some subjective and objective parameters. There are, average and insignificant correlation coefficients by a size between a value judgment of the quality of life and the main subjective and objective indicators. The greatest values of coefficient of correlation are found for such groups of parameters: satisfaction with life and satisfaction with work (r=0,41), assessment of wellbeing and health (r=0,4), education and income (r=0,31), quality of life and financial position (r=0,37), physical fitness and quality of life (r=0,28). The received results found a confirmation in numerous data of literature.



Pic. 1. Communication of objective and subjective indicators of quality of life:
1 – education/income [8; 9]; 2 – wage payment / worked out hours [7]; 3 – satisfaction with life/happiness [7; 9]; 4 – wellbeing/stress [8]; 5 – to the well-being / subjective perception of health [11]; 6 – satisfaction with life / satisfaction with work [6]; 7 – satisfaction with the society / subjective perceptions of quality of life [5]; 8 – satisfaction with own material status/ subjective assessment of quality of life [4]; 9 – education/satisfaction with life [9]; 10 – income/ satisfaction with life (on the example of persons of the first, second and advanced years); 11 – education/happiness [9]; 12 – health/satisfaction with life [9]; 13 – wage payment/ satisfaction life [7]; 14 – education/wellbeing [8]; 15 – education/wellbeing (on the example of persons of the second mature and advanced years); 16 – income/happiness [8; 9]; 17 – physical preparedness/ subjective assessment of quality of life (on the example of persons of youthful and first mature age); 18 – physical preparedness/ subjective assessment of quality of life [11]; 19 – physical preparedness/ value judgment of health (on the example of persons of youthful age); 20 – physical preparedness/subjective perception of health [11]; 21 – education/satisfaction with work [8; 9].

It is possible to claim that in most cases of studying of quality of life isn't provided the development of the corresponding model, and by the allocation of separate components, understanding of communications between them is carried out within certain estimating systems. They can provide the collecting of objective and subjective data, however the compound qualities of life which are picked up according to the research objective. The analysis of the estimating systems (on the example of such which are designed for children and youth) found out that the main components of quality of life is physical and mental health, financial position, pastime free, communication with society, a state of environment (tab. 2).

Table 2

Component of the quality of life of children and youth

Assessment system	Compound qualities of life	Age, years
CHQ	Physical activity, incidence, vital competence, achievement, satisfaction with own life	5–18
CHIP-CE	Physical activity, incidence, achievement, ability to resist to stresses and to adapt	11–17
CHRI	Physical and cognitive functioning, influence of emotions on daily activity	5–12
HSMC	Physical and mental health	0–4
HAY	Physical, cognitive and social functioning, complaints to a physical state of health, feeling of happiness	7–13
PedsQL	Health, emotional and physical wellbeing, labor productivity, relations with people around	2–18
QOLQA	Physical, psychological, social wellbeing, autonomy, a state of environment	10–15

The analysis of a number of the estimating systems found the difficult hierarchical structure, but also compliance to the principles of subjectivity (the perception of the outside world is considered by the individual) and realities (aspects of activity are considered both positive and negative). To the main structures and substructures of quality of life of children and youth belong: physical health (physical and physical activity, pain, vigor, growth and development, incidence), mental health (emotional state (mood, positive and negative emotions, temperament), cognitive functioning), social health (social life, social support, relations with coevals, bully, relations with native, pastime free with parents), environment (school and rest, medical care, safety of conditions of the environment), social-psychological competence, financial position.

Similar results can be made by results of the analysis of the estimating systems for persons of mature and senile age. The structure of quality of life contains physical, mental and social health, pain, mood, dream, social contacts or isolation, labor productivity, a way of pastime free and so forth (tab. 3).

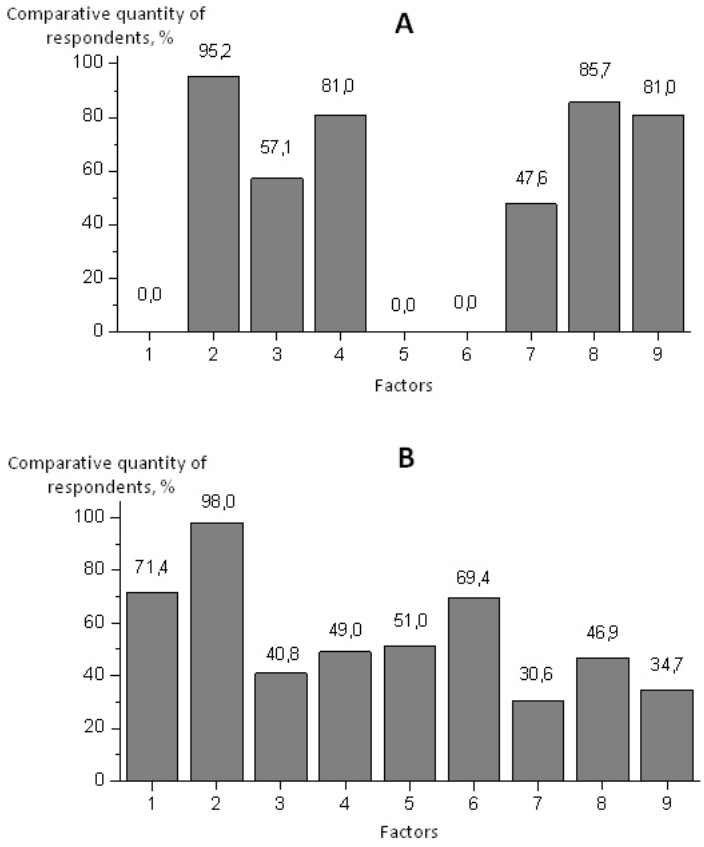
Table 3

The characteristic of the estimating systems which use for studying to quality of life of adults

Questionnaire	Parameters of quantity of life								
	1*	2	3	4	5	6	7	8	9
First and second mature age									
SIP			+	+	+		+		+
HIE	+	+	+		+	+	+		
NHP	+		+		+	+	+		+
QLI	+		+		+		+		
DUKE	+	+	+	+	+	+	+		+
MOS FWBP	+	+	+	+	+	+	+	+	+
MOS SF-36	+		+		+	+	+		
EUROQOL			+		+	+	+		
SF-6D			+	+	+		+		+
Old age									
BSQ		+	+	+	+	+	+		+
CORE-CARE		+	+		+	+			
EASY-CARE	+	+	+	+	+	+	+	+	
GPSS		+		+	+	+			
GSQ	+	+		+	+	+			
MOS SF 36	+	+	+	+	+	+	+		
QOLPSV		+	+		+			+	
SENOTS		+	+		+	+			

*Note. * – 1 – general assessment of wellbeing or state of health; 2 – mental wellbeing; 3 – social wellbeing; 4 – cognitive wellbeing; 5 – physical functioning, in particular, physical activity; 6 – incidence, complaints; 7 – working capacity, daily activity; 8 – estimation of efficiency of treatment, examination or rehabilitation, action on health care; 9 – quality of a dream.*

Factors which influence the quality of life of elderly people are given in pic. 2. Absolutely, according to respondents with poor quality of life, problems with health (95,2%) and in families (81,0%), low level of social activity (57,1%) are capable to worsen wellbeing. The modern generation of elderly people has low expectations of rather own life, because of social and economic problems and events of the first half of the XX century. Such assessment displays the underestimated expectations and opportunities and can be uncharacteristic for the next generations.



Pic. 2. Factors which influence quality of life of elderly people:
A – worsen quality of life (N=21, on the example of persons with poor quality of life); B – improve quality of life (N=49, on the example of persons with high quality of life). 1 – income; 2 – health; 3 – friends; 4 – family; 5 – work; 6 – hobby and interest; 7 – social life and activity; 8 – independence; 9 – mobility.

But, except a good shape of health, the existence of friendly relations with others, positive influence on quality of life has an income (71,4%) and a work (51,0%). Most of respondents (69,4%) as one of factors that is capable to improve quality of life, remember the activity in free time. Elderly people connect the high quality of life not only with absence of diseases, satisfaction with life, but ability to perform daily tasks independently, to carry out a choice independently and not to depend on the help of others. Dependence on a thought and a choice of other 85,7% of respondents with poor quality of life was chosen as a factor which significantly reduces wellbeing. Among respondents with the high quality of life a third of respondents (34,7%) chooses a mobility and nearly a half of respondents chooses an independence (46,9%) as factors which are capable to improve quality of life of the elderly person.

Conclusions:

1. Basic components of quality of life are similar at persons of different age. It allows using the only instrument of measurement of wellbeing irrespective of age, sex, the social status or a state of health of a respondent. The specialized narrowly targeted estimating systems are based on the statement what exactly the absence of diseases testifies to high quality of life and consequently, contain indicators, which are not actual for the main group of the population. Such approach doesn't provide understanding of quality of life, and provides set of sample statistics for use in medical practice.

2. Basic components of wellbeing of a person is a physical component (substructures – somatic health, daily activity, free time), a psychological component (an emotional state, a self-assessment), social activity (interaction, cohesion), a material component (a financial position, employment, living conditions), development and self-identification (purposes and values, autonomy, activity and a choice, education and skills), environment (the rights, characteristic of the environment).

Prospects of the subsequent researches is in the development of the theoretical structure of quality of life that allows characterizing compound qualities of life, connections among them and the main indicators.

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A set of exercises hopping pattern for the initial diagnosis of the degree of overtraining syndrome in athletes involved in cyclic sports

Abstract. *In the article the author presents data on the method of diagnosis of the initial degree of overtraining syndrome in athletes involved in cyclic sports.* ***Purpose****: to develop and assess diagnostic tests to detect early signs of overtraining syndrome in athletes involved in cyclic sports.* ***Material and Methods:*** *developed by the author was applied a set of jumping exercises in 42 athletes with an initial degree of overtraining syndrome in age from 21 to 27 years old male, who were engaged in cyclic kinds of sports (athletics, skiing, cycling, swimming). To control the data obtained were compared with the same athletes before their clinical and functional signs of overtraining syndrome were identified.* ***Results****: using the jumping exercises on track kinematometra control and the expectation of landing an athlete with a spade to the side, front and rear walls of the rectangular contour of the rotation at the time of jumping on 90° and without it as a set of available physical exercise greatly simplifies the identification of the main indicators characterizing changes in the central nervous system in the early stages of overtraining syndrome.*
Keywords: *the central nervous system, chronic overvoltage, test jumping motor tasks.*

Introduction. Overtraining is a pathological state which develops at sportsmen as a result of chronic physical overstrains which clinical picture is defined by functional violations in the central nervous system [2].

The disease is the cornerstone of an overstrain of exciting, brake processes or their mobility in bark of big cerebral hemispheres. It allows to consider pathogenesis of overtraining similar to pathogenesis of neurosises. The essential value in pathogenesis of a disease has the endocrine system and, first of all, hypophysis and bark of adrenal glands [2; 5]. So, according to G. Selye (1960), the general adaptation syndrome develops at an action of a strong irritant (stresor) in an organism, whether a stress in the course of which activity of forward part of a hypophysis and bark of adrenal glands amplifies. These changes define the development of adaptation reactions in an organism to the intensive muscular activity in the endocrine system in many respects. However the chronic physical overstrain can lead to exhaustion of bark of adrenal glands and by that to violation in an organism of the developed earlier adaptation reactions. It is necessary to emphasize that the central nervous system includes and regulates stressful reactions in the development of overtraining. The violation of processes of a pith neurondynamics is the cornerstone of pathogenesis of overtraining how it takes place at neurosises [7].

The functional state of the belowstated departments of the central nervous system changes at neurosis. Thus visceral frustrations which are observed often at overtraining, it is possible to consider as a result of changes of a functional condition of an interweft brain which regulates neurohumoral processes in an organism and controls vegetative, hormonal and visceral functions.

As a result of the above-mentioned reasons the main motive qualities of the trained person, that is at first high-speed, then exact and rough coordination of movements, then power indicators, and, in the last turn, endurance, are broken [3; 4; 8].

Thus, apparently from the aforesaid, the problem is very big and needs a careful approach to studying of such questions, as early diagnostics of a peretrenovanost overtraining at sportsmen, for the purpose of finding of rational ways of treatment and renewal of the trained persons at emergence already of the first symptoms of a disease, the development of methods of timely prevention of this state. However the existing approaches concerning diagnostics of overtraining at sportsmen are based on a reconstruction of physiologic indicators which define a functional condition of a sportsman, and their comparison, with premorbide indicators [9]. Hormonal indicators of blood (the increased level of an epinefrin and norepinefrin, cortisone, adrenokortikotropny hormone) and immunological indicators of blood (lymphocytosis, quantity of the circulating immune complexes, phagocytosis, etc) are used as physiologic indicators of a functional condition of a sportsman. However these indicators aren't specific in diagnostics of overtraining because shifts of the above-mentioned indicators of blood can be observed at other pathological states, for example, diseases of blood (leukosis), autoimmune diseases (rheumatism, tireoidit, allergic states), psychoemotional tension and stressful states. Difficult equipment and reactants are necessary for studying of these indicators which stand much that considerably increases a cost of diagnostics. Sportamen, as a rule, not really favorably treat blood sampling from a vein which leads often to negative consequences and considerably complicates process of carrying out diagnostics. Besides, these indicators of a functional condition of a sportsman find only collateral signs of the developed overtraining when the neurologic state at a sportsman while they don't fix violation of coordination opportunities of sportsmen and calculation by their amplitude of movements which are prints of the main changes at function of the central nervous system is considerably broken is characteristic at initial stages of overtraining at sportsmen. It reduces reliability of diagnostics because thus the possibility of definition of overtraining isn't provided at initial stages of a disease [6].

Communication of the research with scientific programs, plans, subjects. The problem is developed according to the priority direction, the determined Law of Ukraine "About the priority directions of the development of science and technique" by the number 3.5. "Sciences about lives, new technologies of prevention and treatment of the most widespread diseases" within the priority thematic direction 3.5.29. "Creation of standards and technology of introduction of a healthy lifestyle, technology of improvement of quality and safety of food", by the subject "Traditional and nonconventional methods of physical rehabilitation at diseases of different systems of an organism and damages of the musculoskeletal device at persons of different degree of fitness". Number of the state registration – is 0111U000194.

The objective of the research: to develop and to estimate diagnostic tests for the identification of early signs of overtraining at sportsmen who are engaged in cyclic sports.

Materials and methods of the research. 42 male sportsmen from 21 till 27 years old were under our supervision who were engaged in cyclic sports (track and field athletics, skiing, cycling, swimming) and in which the initial degree of overtraining was found. From them are masters of sports – 24 persons, candidates in the master of sports – 18 persons.

The developed by us complex of jumping exercises on a path of a kinematometer with control and calculation of a landing of a sportsman with a spade on side, forward and back walls rectangular to a contour with rotation at the time of a jump on 90° in the complicated conditions of a performance of exercises and without a rotation – in the simplified conditions was applied as methods of the research [1].

For control the obtained data were compared to data of the same sportsmen to identification in them clinical-functional signs of overtraining.

Processing of the obtained data was carried out by means of a method of mathematical statistics of S. N. Lapach, A. V. Chubenko, P. N. Babich (2000).

Results of the research and their discussion. The processes of storing and storage in memory of information on the structure of carried out and learned physical actions which comes to the central nervous system from different receptors is a psychoneurological basis of study of the trained persons to new exercises and accumulation at them motive experience in the process of renewal of the broken motive stereotype under the influence of overtraining. Volumes and durability of this storing belong to quantitative characteristics of motive memory. A performance of the above-mentioned group of motive tasks aims to find out that remembers, analyzes and reproduces abilities of the central nervous system at initial degrees of overtraining at sportsmen.

Thus, the research was conducted by us. The starting line is carried out on a path to a kinematometer from a linoleum of dark color 8 m long and 1,5 m wide, at distance of 3,5 m from its first line from which sportsmen (after warm-up) do two jumps from a place in succession on range taking into account their results. Then 50% of the longest of them undertake and it is noted from the starting line towards a first line of a kinematometer. The investigated stands on marks 1,5 sm farther, connected feet. The rectangular contour with its distance to feet on 1,5 sm is drawn by a chalk round them by means of a ruler. Then the investigated jumps from a place by a push of both feet from the starting line, trying to get by feet to a contour, not taking up its sides – back, forward and side. Jumps repeat with intervals 30–60 s, every time measures thus landing accuracy in a rectangular contour. Thus, jumping exercise are carried out in the simplified conditions, that is without rotation of the sportsman during a jump, and in the complicated conditions, that is with its rotation on 90°. The predicted number of possible attempts when performing of the noted exercises in the simplified conditions, makes 10 attempts. Next day the same repeats, but jumps are carried out in the complicated conditions, that is with rotation of the sportsman on 90°. The predicted number of possible attempts when performing exercises thus makes already 20 attempts. In case of overtraining sportsmen have outstanding changes in function of the central nervous system which are characterized by violation of their coordination opportunities and calculations of amplitude of movements by them when performing these exercises that is fixed by the accuracy of a landing of sportsmen after a jump in a rectangular contour.

In the analysis of the obtained data it was established that sportsmen with initial degrees of overtraining have the speed of storing, an exception from memory and a reconstruction of the correct structure of jumps were authentically below, than at healthy sportsmen were (tab. 1).

Table 1

Average number of attempts which is the share of one sportsman with initial degree of overtraining and the healthy sportsman for the achievement of a stable exact performance of a jump in a rectangular contour

Type of a jump	Average number of attempts in jumps on accuracy		t	p
	Sportsmen with initial degree of overtraining	Healthy sportsmen		
	$\bar{X}$±m	$\bar{X}$±m		
From a place without a turn in a flight on 90 degrees	10,00±0,35	6,00±0,15	10,52	<0,0001
From a running start without a turn in a flight on 90 degrees	14,00±0,53	9,±0,24	8,62	<0,0001
From a place with a turn in a flight on 90 degrees	17,00±0,57	13,00±0,28	6,25	<0,0001
From a running start with a turn in a flight on 90 degrees	19,00±0,61	15,00±0,32	5,80	<0,0001

All this testified what deteriorations of the impressed and reproductive ability of the nervous system in the conditions of study to jumping exercises of different coordination complexity occur even at initial degree of overtraining. The correctness of this conclusion is validated by that a bigger number of attempts was necessary for sportsmen with signs of overtraining, than healthy for the achievement of a steadily exact performance of each of jumps (tab. 1, 2).

Sportsmen with the initial degree of overtraining performed all four tasks with big mistakes in comparison with healthy persons; distinctions had a significant character (tab. 3).

Upon a completion of exercises we defined an index of mistakes by the following ratio:

$$Ind = \frac{n \cdot 100}{m}\%,$$

where: Ind – an index of mistakes when performing of the noted exercises of %; n – a number of the executed attempts without mistakes when performing exercises (number of times); m – we offer a number of possible attempts when performing exercises (number of times) (tab. 4).

Table 2

Average number of attempts after the first successful attempt which is the share of one sportsman with the initial degree of overtraining and the healthy sportsman, to stabilization of an exact landing in a rectangular contour

Type of a jump	Average number of attempts after the first successful attempt to stabilization of an exact landing in jumps		t	p
	Sportsmen with initial degree of overtraining	Healthy sportsmen		
	$\bar{X}$±m	$\bar{X}$±m		
From a place without a turn in a flight on 90 degrees	6,00±0,12	3,00±0,13	16,67	<0,0001
From a running start without a turn in a flight on 90 degrees	9,00±0,18	5,00±0,12	18,18	<0,0001
From a place with a turn in a flight on 90 degrees	11,00±0,25	8,00±0,15	11,11	<0,0001
From a running start with a turn in a flight on 90 degrees	12,00±0,25	9,00±0,21	7,89	<0,0001

Table 3

The average size of mistakes during a landing in different jumps counting on one sportsman with initial degree of overtraining and one healthy sportsman

Type of a jump on landing accuracy	Side rectangular to a contour	Average size of mistakes, mm		t	p
		Sportsmen with initial degree of overtraining	Healthy sportsmen		
		$\bar{X}$±m	$\bar{X}$±m		
From a place without a turn in a flight on 90 degrees	distant near at the left on the right	16,50±0,95 20,80±1,01 12,60±0,67 12,10±0,64	11,81±0,76 16,50±0,83 9,70±0,42 10,10±0,54	3,88 3,28 3,67 2,96	<0,0001 <0,001 <0,0001 <0,01
From a running start without a turn in a flight on 90 degrees	distant near at the left on the right	18,30±1,10 26,80±1,30 11,90±0,58 12,00±0,61	14,60±0,83 19,90±1,05 10,20±0,48 10,50±0,61	2,68 4,13 2,27 1,74	<0,005 <0,0001 <0,05 >0,05
From a place with a turn in a flight on 90 degrees	distant near at the left on the right	21,80±1,19 34,50±2,31 17,40±1,04 12,50±0,72	15,40±0,89 24,60±2,11 13,20±0,53 11,10±0,59	4,29 3,10 3,59 1,51	<0,0001 <0,005 <0,0005 >0,05
From a running start with a turn in a flight on 90 degrees	distant near at the left on the right	21,60±1,19 34,50±2,31 17,40±1,02 18,10±1,01	17,50±0,91 24,60±2,11 13,20±0,97 16,10±0,86	2,87 3,10 2,98 1,50	<0,005 <0,005 <0,005 >0,05

Table 4

The size of an index of mistakes which is the share of one sportsman with initial degree of overtraining and one healthy sportsman of %

Type of a jump	Size of an index of mistakes	
	Sportsmen with initial degree of overtraining	Healthy sportsmen
	$\bar{X}$±m	$\bar{X}$±m
From a place without a turn in a flight on 90 degrees	76	95
From a running start without a turn in a flight on 90 degrees	58	95
From a place with a turn in a flight on 90 degrees	67	92
From a running start with a turn in a flight on 90 degrees	55	90

As a rule, premorbide indicators in relation to an index of mistakes at healthy sportsmen this index made 100–95% in the simplified performance conditions of jumping exercises, and in the complicated conditions – from 100% to 90%. In the

presence of an index of mistakes from 95% to 50% in the simplified performance conditions The first stage of overtraining was diagnosed for the studied sportsmen and from 90% to 40% – in the complicated conditions of a performance that was confirmed by the data of clinical-functional inspections.

Conclusions:

1. The use of jumping exercises on a path of a kinematometer with control and calculation of a landing of the sportsman with a spade on side, forward and back walls of a rectangular contour with rotation at the time of a jump on 90° and without it as to a complex of available physical exercises considerably simplifies definitions of the main indicators which characterize shifts in the central nervous system at initial stages of a disease.

2. The application as physiologic indicators of a functional condition of the sportsman of accuracy of a performance of a complex of available physical exercises in the simplified and complicated conditions, the definition of an index of mistakes at execution of these exercises and the comparison of it with premorbide indicators according to the above-mentioned ratios allows defining violation of coordination opportunities and calculation of amplitude of movements at the sportsmen that characterize changes in his central nervous system already on initial degrees of overtraining and to increase thus the reliability of identification of signs of initial degrees of overtraining.

Carrying out the joint application of immunological, hormonal inspections and motive tasks is a **perspective** for the definition of overtraining of the second degree at sportsmen taking into account their sex.

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Rationale for determining the types of adaptation to predict in sport

Abstract. ***Purpose:*** *theoretical and practical study adaptation types beginners.* ***Materials and Methods:*** *the analytical synthesis of scientific literature data, the determination of the concentration of lactic acid testing of motor activity.* ***Results:*** *based on the parameters set lactate types of adaptation: «sprinters», «stayers», «mixed type».* ***Conclusions:*** *the establishment of types of adaptation makes it possible to recommend a special focus budding athletes in the sport.*
Keywords: *adaptation, types of adaptation, physical loading, growth of functional and physical indexes rates.*

Introduction. The research of a problem of adaptation allows predicting the level of physical and functional development and achievement in sport. It is shown by many authors that adaptation opportunities can develop only in the presence in an organism of certain genetic prerequisites [1; 3; 4; 6; 14]. This mechanism testifies to pre-adaptation or perspective adaptation that is to forestalling of some evolutionary processes.

In opinion [8; 20], evolutionary-phylogenetic signs possess a rather bigger heredity.

A doctrine about adaptation types in biology appeared in the seventies of the last century. On the basis of these data some models of types of adaptation are developed, however these results of researches generally showed the adaptation of a person to certain social and climatic conditions [3; 7; 10].

The process of the research of types of adaptation in sports activity began from 80th years of the last century actually and is relevant now [7; 8; 10; 15; 16; 21; 22]. So, V.P. Kaznacheyev [7] defines quantitative signs at the foundation of types of adaptation in the conditions of sports activity: “sprinters”, “stayers” and persons with the mixed adaptive “strategy”.

Features of a metabolism which are under the genetic control can be a probable basis of the arising distinctions in adaptation. However the author doesn’t show that it is possible to use as backbone factors which would reflect features of a metabolism at adaptation to specific physical activities.

Being guided by the theory of functional systems of P. K. Anokhin [2], many authors come to opinion that the result of action of this system acts as a backbone factor [5; 13]. Explaining this mechanism, they proceeded from such positions: 1) the anaerobic glycolysis is an indicator of urgent adaptation to muscular loadings, to a stress and a deviation indicator in a state of health; from a position of long-term adaptation metabolic process is defining at a certain neurohumoral regulation; 2) the anaerobic process prevails in fast motive units; 3) the anaerobic exchange of carbohydrates is followed by the formation of the metabolic deadlock (lactic acid). Therefore the lactate is an objective marker of anaerobic opportunities of adaptation to physical activities.

The objective of the research: the purpose of the real researches consists in an explanation of mechanisms of emergence of types of adaptation and their use for the determination of specifics of sports activity.

Materials and methods of the research. Annual observations of the same boys and girls are made (50 people – the experimental group and 50 people – the control group). Boys and girls of EG were engaged in running types of track and field athletics according to the program of initial sports preparation. Boys and girls of CG went in for physical culture according to the program of the comprehensive school. During a year the estimation of level of physical development, biological maturity, health, development of the leading qualities of biomobility, metabolic profile were carried out at children 4 times.

The tests recommended for the establishment of physical activity of pupils and young sportsmen were applied to the determination of nature of metabolic reactions. One of these tests was run of 300 m with the maximum speed. The response of organism of pupils was investigated on haemo-dynamics, biochemical indicators, and condition of the neuromuscular device. Blood sampling from pulp of a finger was carried out before and after loading. Lactate, glucose, urea, pH, parameters of red blood were defined. In a year examinees carried out step loading on the stationary bicycle in vitro for the determination of level of the general working capacity and indicators of adaptability of vegetative systems.

Results of the research and their discussion. Results of year researches on the same children who are engaged and not playing sports allowed to note that nature of metabolic reactions at muscular loadings is genetically predetermined and authentically interconnected with the nature of adaptation of organism of children to physical activities.

Already at this age (9–10 years old) boys and girls differed on the level of development of the process of anaerobic glycolysis. Three types of adaptation metabolic reactions are established.

The first type of metabolism - “stayer” – is characterized by that anaerobic glycolysis is involved slightly at physical activity (run on 300 m). The work is carried out mainly due to aerobic providing. The quantity of lactate in blood doesn’t exceed the relative level PANO (4,0 mmol • l^{-1}).

The second type of metabolism – “sprint” – is characterized by that anaerobic glycolysis is pronounced at physical activity (run of 300 m). The concentration of lactic acid is within 8 mmol • l^{-1}.

The third type of metabolism – “mixed” – is characterized that the concentration of lactic acid is in organism of children ranging from 5 till 0,8 mmol • l^{-1}.

Analyzing the received results, it is established that features of metabolic reactions under the influence of the training program fluctuated wavy and didn’t keep within any rigid borders. However the established dependence defines conditions of fitness after loading (tab. 1).

The presented results accurately define a dependence of speed – a lactate which gives the grounds to conclude: high-speed endurance develops depending on the level of anaerobic glycolysis [17–20].

Table 1

Dynamics of biochemical indicators at run of 300 m who are engaged and not playing sports

Indicators	EG (n=50)	CG (n=50)	Reliability of distinctions
Dormant state			
HR (bpm^{-1})	88,05±3,12	87,6±3,05	p>0,05
Lactate ($mmol \cdot l^{-1}$)	88,03±0,07	4,02±0,03	p<0,05
Glucose ($mmol \cdot l^{-1}$)	7,08±0,09	4,53±0,7	p<0,01
Urea ($mmol \cdot l^{-1}$)	5,45±0,36	6,73±0,41	p>0,05
Work			
Time (s)	59,05±1,07	63,05±3,05	p<0,05
Speed ($m \cdot s^{-1}$)	6,4±0,03	4,7±0,7	p<0,05
1-st minute of restoration			
HR (bpm^{-1})	1,78±19	1,85±12,0	p<0,05
Lactate ($mmol \cdot l^{-1}$)	15,37±2,9	14,28±6,3	p<0,05
Glucose ($mmol \cdot l^{-1}$)	5,71±1,03	6,37±0,83	p<0,05
10-th minute of restoration			
HR (bpm^{-1})	123,5±9,1	138,8±8,1	p<0,05
Lactate ($mmol \cdot l^{-1}$)	14.78±1,25	17,83±9,1	p<0,05

At influence of the unambiguous training program in which there was no purposeful development of high-speed endurance, it is revealed that boys of the "sprint" type of a metabolism and with the "mixed" type had almost identical rates of its gain (24,9% and 23,8%), whereas rates of a gain of indicators of high-speed endurance made only 16,5% at boys with the "stayer" type of a metabolism.

At girls in a year of sports activities rates of a gain of indicators of high-speed endurance made: the "sprint" type of a metabolism – 26,6%, with the "mixed" type – 19,5% and with the "stayer" – 8,75%. At the girls who aren't playing sports such dependence was defined: the "sprint" type – 14,4%, the "mixed" type – 14,0% and the "stayer" type – 3,96%.

Long-term researches testify that specifics of metabolic reactions are in considerable dependence on features of the neuromuscular device [11; 12]. So, children with the type "sprint" of a metabolism authentically exceeded in indicators of the maximum "explosive" force, and with the type "stayer" – indicators of power endurance.

At the age of 9–10 years old boys and girls with the type "sprint" of a metabolism were ahead of the contemporaries in the weight, growth, the circle body sizes, and with the "stayer" – were less than growth easier. Already from the first investigation phases it is established that boys and girls of the type "sprint" of a metabolism surpassed the contemporaries in test indicators with a breath delay.

A certain interest was shown by authors [9; 12] to a condition of the cardiovascular system. Girls and boys of 9-10 years old with the "sprint" type of a metabolism are ahead of the contemporaries on the development of myocardium (tab. 2).

The reliable distinctions between indicators of children are established in the response of an organism to loading and restoration processes. The deepest shifts were installed in the haemo-dynamics at persons with the "sprint" type of a metabolism, the smallest – with the "stayer" type.

To concretize an adaptive typology in sport more, we suggest altering some her concept presented in the monograph of T. I. Alekseeva [1].

The adaptive type is the adaptation of a human body to physical activities which is representing a norm of biological reactions to physical impact and having external expression in specifics of biomobility and morphofunctional manifestations. Any type of adaptation is predetermined genetically.

Features of a metabolism at physical activities and nature of adaptation of organism of children (9–10 years old) are authentically interconnected with the formation of specifics of constitutional typology: "sprint", "stayer", "mixed" [7].

The constitutional type of "sprinter" is characterized by the high level of not only aerobic, but also anaerobic glycolytic exchange, ability adequately to transfer the hypoxemic influences arising at muscular activity. Children with such constitutional feature are ahead of the contemporaries in rates of physical development, physical working capacity, in the level of manifestation of force, speed, high-speed and power endurance. At this age category – 9–10 years old – the carbohydrate anaerobic exchange is early very much interfaced with proteinaceous one that is a specific adaptation manifestation.

Children with the constitutional type of "sprinter" quickly adapt for physical activities of high-speed and power character. A sportsman can execute for training classes the considerable volume of work with high intensity. It causes considerable deviations in a homeostasis of muscles and blood. The excess accumulation of a lactate causes a decrease and blocking

Table 2

Dynamics of biochemical indicators at run of 300 m who are engaged and not playing sports (according to L. G. Kharitonova, 1991)

Indicators	EG (n=50)	CG (n=50)	Reliability of distinctions
Girls of 9-10 years old			
Sinus arrhythmia	18,7	10,2	25,5
Sinus tachycardia	6,2	38,3	41,5
Signs T-infantile	6,2	50	16,5
Regular rhythm, reaction to adequate loading	68,8	2,8	16,5
Boys of 9-10 years old			
Sinus arrhythmia	36,5	14,2	35,5
Sinus tachycardia	15,5	35,7	11,7
Signs T-infantile	0	28,5	11,7
Regular rhythm, reaction to adequate loading	48,1	21,6	41,1

of an oxidizing way of resynthesis of ATP during a restoration. The organism of sportsmen is more slowly restored in such constitutional typology. Sportsmen of this population have most often certain deviations in a condition of cardiovascular system at sports that is they are most sensitive from the point of view of an assessment of a state of health.

The constitutional type "stayer" is characterized by slightly other fenogenetic properties – low rates of the level of physical development, low ability to transfer hypoxemic influences. The development of organism of children of this constitutional typology is carried out generally due to oxidizing resynthesis of ATP.

Specific features in physical activity are shown at children of the constitutional type "stayer". They are capable to perform work of power, high-speed and power character in a lesser extent. But they are capable to manifestation of types of endurance; there are no pronounced functional shifts in acid-base balance and haemo-dynamics.

The constitutional type "mixed" is intermediate between two extreme types. However depending on an orientation of purposefulness of the motive activity their adaptation opportunities come nearer either to "sprint", or to "stayer" type.

Conclusions:

1. The offered results of the research allow defining objectively types of adaptation of sportsmen-beginners that gives the grounds to recommend a special orientation in sport specifically.

2. The correction of the educational-training process of sportsmen-beginners on the basis of types of adaptation opportunities provides achievements of high level of fitness in a concrete kind of activity.

Prospects of further researches. It is necessary to establish adaptation types at the initial stages of the training process which will provide a purposeful development of special working capacity.

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Improving the training process of highly skilled bodybuilders in the preparatory period, general preparatory phase

Abstract. ***Purpose:*** *to improve the method of training highly skilled bodybuilders.* ***Material and Methods****: the study involved eight highly skilled athletes, members of the team of Ukraine on bodybuilding.* ***Results:*** *comparative characteristics of the most commonly used methods of training process in bodybuilding. Developed and substantiated the optimal method of training highly skilled bodybuilders during the general preparatory phase of the preparatory period, which can increase body weight through muscle athletes component.* ***Conclusions:*** *dynamic load factor to raise the intensity of training loads allows orientation help to increase volumes shoulder muscles.*
Keywords: *General preparatory stage training process, qualified bodybuilder, muscular component, the optimum method.*

Introduction. Bodybuilding – is a kind of sport where sportsmen compete by a harmonious development of muscles of a body. The main criteria of an assessment at bodybuilding are volumes of muscles of a sportsman, their proportional development, and also a definition and separation. In the federation IFBB sportsmen compete in such obligatory poses: "a double biceps in front", "the best muscles of a back, chest muscles in front", "chest muscles, a biceps sideways", "a double biceps from behind", "the widest muscles of a back from behind", "a triceps of any hand", "a press hip". There are seven obligatory poses, in four of which the main attention of referees is directed on muscles of hands ("a double biceps in front", "chest muscles, a biceps sideways", "a double biceps from behind", "a triceps of any hand") [1–7; 15].

The analysis of domestic and foreign special literature showed that the problem of increase in volume of muscles of a shoulder was considered by such specialists of the branch as V. G. Oleshko, V. Y. Jim, A. V. Samsonova, Joe and Ben Weider, Mike and Ray Mentzer, Arnold Schwarzenegger [14; 4–10; 15].

However there is still no evidence-based technique of training for the increase in volume of muscles of a shoulder in domestic sport. Therefore coaches and sportsmen should get a practical experience by trials and errors. Athletes copy training programs of professionals of bodybuilding very often which have great opportunities for renewal, better meal and sports food [9; 10]. Firms of sports food provide sportsmen that they are represented to everything necessary. In the USA for the team works each professional sportsman which consists of a trainer, a sports doctor, a massage therapist, a research laboratory, managers but others. Such sportsmen are provided to all necessary for growth of muscular volumes and renewal. In Ukraine in 2015 Alexander Slobodyanyuk is the only sportsman who has the card of the professional. It is necessary for most of domestic sportsmen to look for sources arrived for ensuring preparation which needs a large number of material resources. Therefore copying of programs of western bodybuilders by domestic sportsmen threatens with an overtraining [7; 9; 11]. It testifies to need of the search of an optimum technique of training of highly skilled bodybuilders.

Communication of the research with scientific programs, plans, subjects. The scientific research is executed by a subject of the Built plan of the research work in the sphere of physical culture and sport for 2011-2015 by a subject 3.7 "Methodological and organizationally-methodical bases of definition of an individual norm of a physical state of a person" (number of the state registration is 0111U000192).

The objective of the research: the foundation of an advanced technique of training of muscles of a shoulder for highly skilled bodybuilders.

Materials and methods of the research. *Methods of researches:* theoretical method and generalization of literature, pedagogical supervision, pedagogical experiment, method of mathematical statistics. *Materials of researches:* 12 bodybuilders of high qualification took part in the experiment. The age of sportsmen is 25-31 years old. The body weight of sportsmen makes: from 80±2 kg – till 120±2 kg. Participants were distributed on three experimental groups on four sportsmen of an identical sports qualification in everyone (1 MSIC and 3 MSU). Also before the experiment the testing in special exercises was held which were used in the experiment in order that all groups had identical power opportunities in the offered exercises. Participants of the experiment trained 4 times for a week within 8 weeks.

Results of the research and their discussion. The use of the training process of highly skilled bodybuilders caused an application of three options of training techniques which differed in loading and volume of training exercises, rest and intensity. The assessment is carried out by means of diaries of training in which the quantity and volumes of training work were specified.

The efficiency of preparation was estimated by means of method of expert evaluations which provided an application of information concerning the implementation of instructions of a trainer, dynamics of power and endurance indicators, and also anthropometrical intentions.

Participants of the experiment trained four times for a week. Sportsmen of the EG1 trained by a technique of such split:

1. Monday – muscles of a chest and a triceps.
2. Tuesday – a back and a biceps.
3. Wednesday – rest.
4. Thursday – delta-like muscles and muscles of an abdominal tension.
5. Friday – muscles of feet.
6. Saturday and Sunday – rest.

As you can see from the split, muscles of a shoulder trained together with their synergists (tab. 1). This technique is

widely used by highly skilled bodybuilders which was published in the magazine “Muscle and Fitness” by the famous trainer Joe Weider for the first time.

Table 1

Load of shoulder muscles for the EG1 during one microcycle

Name of exercise	Number of trials	Number of repetitions	Weight of gymnastic apparatus (kg)	Time of rest (min)	NRB	Tonnage (kg)
Monday (muscles of a chest and a triceps)						
Bar press, lying	4	10	150	2	40	6000
Bar press at an angle	3	12	120	1,5	36	4320
Spreadings with dumbbells, lying	3	15	18	1,5	45	810
Bringing together on exercise machine “Peck-back”	3	15	40	1,5	45	1800
Press, lying by a narrow girth	4	12	110	2	48	5280
The French press of a bar, lying	3	10	40	1,5	30	1200
The French press of a dumbbell, sitting by one hand	3	8	18	1,5	24	432
Extensions of hands on the block	3	15	30	1,5	45	1350
Tuesday (muscles of a back and a biceps.)						
Pull of the vertical block for a chest	3	12	60	1,5	36	2160
Draft of a bar in an inclination	3	10	100	2	30	3000
Deadlift	3	12	180	2	36	6480
Bendings of hands with a bar, standing	4	8	49	1,5	32	1568
Bending of hands with dumbbells, sitting	3	12	18	1,5	36	648
Bending “Molot»	3	10	16	1,5	30	480
Concentrated bendings of hands on the crossover	3	15	10	1,5	45	450
Sum of load of two-headed and three-headed muscles of a shoulder	26	90	291		290	11408

Note. *In the table load of shoulder muscles is noted during a week microcycle, load of muscles of a chest and a back which trained in the same days isn’t considered. NRB – a number of raising of bars, a tonnage – a number of the kilograms which were lifted during an exercise performance.*

The feature of this technique is that muscles of a biceps work in a work for a back, and muscles of a triceps in work for muscles of a chest. A lack of such technique is that muscles of a shoulder are tired during the work on muscles of a back and a chest that leads to the decrease in intensity when performing special exercises for these muscular groups.

Training of sportsmen of the EG2 differed in that a biceps and a triceps of a shoulder trained throughout one classes. The split was so:

1. Monday – muscles of a back and a chest.
2. Tuesday – muscles of feet.
3. Wednesday – rest.
4. Thursday – muscles of a shoulder and a forearm.
5. Friday – delta-like muscles.
6. Saturday and Sunday – rest.

Sportsmen of the EG3 also trained four times for a week, had the similar split to the EG2, only a day of training of muscles of hands differed. The program of trainings of muscles of a shoulder for the EG2 was in such a way: at first exercises on a triceps were carried out. The number of exercises was made – 4, number of attempts in exercise – 3–4, number of repetitions fluctuated from 8 to 12, rest between attempts made 1,5 min. After training of a triceps sportsmen of the EG2 worked on a biceps. The number of exercises – 4, number of attempts – 3–4, number of repetitions – 8–12, rest between attempts – 1,5 min. The time of training made 55 min (tab. 2).

The program of training of muscles of a shoulder for the EG3 was developed by the author of the research and was in such a way: two exercises were chosen, one on a triceps, one on a biceps. One attempt of the first exercise on a triceps, rest 1,5 min, then attempt on a biceps was carried out. After that rest 1,5 min, so four attempts were carried out.

Thus, rest between attempts on one group of muscles made 3 min. It allows muscle to train in a zone of the sub-maximum intensity, and due to longer rest the sportsman can train with a big weight which promotes the development of muscular volumes at the expense of hypertrophy of myofibrils. The example of the program for the EG3 is given in tab. 3.

As a result of the conducted by us research it was revealed that sportsmen of the first experimental group during a week microcycle executed 290 raisings of a bar on shoulder muscles. The tonnage made 11,408 kilograms, the time for rise in this weight made 45 min in the sum. Sportsmen of the second experimental group executed 290 raisings of

Table 2

Program of training of muscles of a shoulder for the EG2

Name of exercise	Number of trials	Number of repetitions	Weight of gymnastic apparatus (kg)	Time of rest (min)	NRB	Tonnage (kg)
Bringing together on exercise machine "Peck-back"	4	12	120	2	48	5760
The French press of a bar, lying	3	10	50	1,5	30	1500
The French press of a dumbbell, sitting by one hand	3	8	20	1,5	24	480
Extensions of hands on the block	3	15	35	1,5	45	1575
Bendings of hands with a bar, standing	4	8	50	1,5	32	1600
Bending of hands with dumbbells, sitting	3	12	20	1,5	36	720
Bending "Molot»	3	10	18	1,5	30	540
Concentrated bendings of hands on the crossover	3	15	12	1,5	45	540
Sum of load of two-headed and three-headed muscles of a shoulder	26	90	325		290	12715

Note. *NRB – a number of raising of bars, a tonnage – a number of the kilograms which were lifted during an exercise performance.*

Table 3

Program of training of a shoulder for the EG3

Name of exercise	Number of trials	Number of repetitions	Weight of gymnastic apparatus (kg)	Time of rest (min)	NRB	Tonnage (kg)
Bringing together on exercise machine "Peck-back"	4	12	4	132	48	6336
Bendings of hands with a bar, standing	4	8	3	52	32	1664
The French press of a bar, lying	3	10	3	55	30	1650
Bending of hands with dumbbells, sitting	3	12	3	22	36	792
The French press of a dumbbell, sitting by one hand	3	8	3	21	24	504
Bendings "Molot»	3	10	3	20	30	600
Extensions of hands on the block	3	15	3	35	45	1575
Concentrated bendings of hands on the crossover	3	15	3	12	45	540
Sum of load of two-headed and three-headed muscles of a shoulder	26	90		349	290	13661

Note. *NRB – a number of raising of bars, a tonnage – a number of the kilograms which were lifted during an exercise performance.*

bars on shoulder muscles. The tonnage made – 12,715 kilograms during a microcycle, the spending time – 45 minutes. Sportsmen of the third experimental group also executed 290 raisings of a bar on shoulder muscles, the tonnage equaled 13,661, the spending time made 45 min (tab. 4).

Table 4

Comparisons of loading during one microcycle for EG1, EG2, EG3

Training groups	Tonnage (kg)	Time (min)	NRB	Coefficient of intensity
EG1	11408	45	290	253,5
EG2	12715	45	290	282,6
EG3	13661	45	290	303,6

Note. *The tonnage – a number of the lifted kilograms on this group of muscles, NRB – a number of raising of a bar, time – a number of the minutes spending for a performance of this work, coefficient of intensity equals to number of the lifted kilograms for a unit of time.*

Apparently from tab. 4, the time and the number of raisings of a bar in all three groups remained identical. Sportsmen of the first group showed the smallest intensity in a type of fatigue of muscles of hands in operating time over synergists of these muscles. The greatest intensity and working weight was shown by sportsmen of the experimental group No. 3 that trained by the offered by the author technique.

In tab. 5 it is brought data of a muscle gain of a shoulder of all sportsmen who took part in the experiment. Apparently

from the table, sportsmen of the experimental group No. 1 increased volumes of muscles of a shoulder on average on 0,97 sm, sportsmen of the experimental group No. 2 – on 1,22 sm, sportsmen of the experimental group No. 3 – on 1,45 sm.

Table 5

Gain of volume of muscles of a shoulder during the experiment (EG1, EG2, EG3), sm

Sportsman	Category	The volume of muscles of a shoulder at the beginning of the experiment	The volume of muscles of a shoulder at the end of the experiment	Gain of volumes	Average gain in group
Experimental group 1					
1	MS	47,5	48,45	0,95	0,9725
2	MS	44	44,88	0,88	
3	MS	52,5	53,55	1,05	
4	MSIC	50,5	51,51	1,01	
Experimental group 2					
1	MS	46,5	47,6625	1,16	1,22
2	MS	44	45,1	1,1	
3	MS	52	53,3	1,3	
4	MSIC	52	53,3	1,3	
Experimental group 3					
1	MS	45,1	46,47875	1,35	1,45
2	MS	46,2	47,586	1,39	
3	MS	49,4	50,882	1,48	
4	MSIC	52,1	53,6424	1,56	

Conclusions. Thus, it is revealed that the technique developed by the author is optimum for the accumulation of volumes of two-headed and three-headed muscles of a shoulder of highly skilled bodybuilders. Sportsmen who used this technique within two months in the experimental group No. 1 increased volumes of muscles of a shoulder on average on 0,97 sm, sportsmen of the experimental group No. 2 – on 1,22 sm, sportsmen of the experimental group No. 3 – on 1,45 sm. The compliance between the increase in intensity of training and a gain of muscular weight is also revealed. The volume of these muscles grows with the increase in intensity in special exercises on a group of muscles. The advanced technique of training of muscles of a shoulder can be recommended to highly skilled bodybuilders who try to increase the volume of these muscles at the expense of hypertrophy of myofibrils.

The subsequent researches have to contain the development and foundation of the training process of highly skilled bodybuilders in the competitive period of preparation.

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Analysis of competitive activity and special technical readiness between football players in age of 10–12 years

Abstract. ***Purpose:*** *to define the dynamics of technical preparedness and competition activity of young footballers in age 10–12.* ***Material and Methods:*** *analysis and generalization of literary sources; pedagogical supervisions; instrumental method of registration of competition performance indicators; methods of mathematical statistics. In research 24 footballers took part 10–12. Playing activity was analyzed during 18 games of championship of s. Kharkiv on football.* ***Results:*** *dynamics of indicators presented by tests: dribbling, stroke counters, shot on goal, dribbling with a stroke 5 laps, juggling, hit the ball on the accuracy.* ***Conclusions****: it was determined that the total command of technical and tactical actions (TTA) during competitive activity increases with age. The 10-year-old young players perform per game 324,6±12,3 TTA, at 11-years of age, the figure was 407,1±14,6 TTA, and in 12-years – 433,2±13,8 TTA.*
Keywords: *young footballers, tests, competitive activity, technical and tactical actions.*

Introduction. It is known that the effective management of training and competitive process in sports is impossible without a systematic control of physical, technical and game preparedness of sportsmen [6; 7]. The main methods of such control are pedagogical control examinations (tests) which have to meet requirements of informational content, reliability and equivalence [1; 2].

Testing is one of the leading factors of a pedagogical control on which the quality of carrying out the subsequent improvement of one or another part of preparedness in football depends substantially: technical, tactical, physical, and psychological and others. It is considered that exactly technical training most determines the quality of the process of long-term preparation without diminishing a value of other parties of preparedness and understanding a need of the integrated approaches to the solution of problem points of testing in the system of pedagogical control of the level of preparedness of football players [5; 8; 9].

The efficiency of the process of preparation in modern conditions is caused by the use of means and control methods as to the instrument of management in many respects which will allow executing a feedback between a coach and a player and on this basis to increase the level of administrative decisions when training players. Taking into account it, a control of the competitive activity and technical preparedness of young football players is the actual direction in the theory and the technique of creation of the training process.

Communication of the research with scientific programs, plans, subjects. This work is performed according to 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" (No. of the state registration is 0111U001722) and the initiative subject of the RW of the chair of football and hockey of Kharkov state academy of physical culture for 2011-2015 by a subject: 2.6. "Optimization of the educational and training process of football players of different qualification" (No. of the state registration is 0111U003127).

The objective of the research: to determine the dynamics of technical preparedness and competitive activity of young football players of 10-12 years old.

Research tasks:

1. To define the dynamics of indicators of technical preparedness of young football players of 10-12 years old.
2. To carry out the comparative analysis of quantitative general technical and tactical actions of players of different age (10–12 years old).

Materials and methods of the research: analysis and synthesis of references; pedagogical supervision, tool method of registration of indicators of competitive activity; methods of mathematical statistics [9].

The research was conducted on the basis of children's football club "Arsenal" in Kharkov in which 24 football players of 10-12 years old took part. The game activity was analyzed during 18 games of a team in the superiority of football of Kharkov. Testings of technical training were held four times before the first circle (in 28.08.2013), after the first circle (in 23.11.2013), before the second circle (in 27.03.2014) and after the end of the second circle (in 05.06.2014) of the superiority of football of Kharkov.

Results of the research and their discussion. Indicators of a performance of dribbling, enclosing of supports with the subsequent shot at the goal for the first year of researches from 10 till 11 years old didn't have statistically significant differences ($p>0,05$), at the same time as the reliable differences are in the subsequent age piece from 11 to 12 years old, ($t=2,13$; $p<0,05$) (tab. 1, tab. 2).

In a bigger measure the training process of young football players affected the dynamics of indicators of dribbling with enclosing of 5 circles which changed annually, especially it concerns the first year of researches (from 10 to 11 years old ($t=5,82$; $p<0,001$) (tab. 2).

The same dynamics is traced in *juggling by a ball*. Indicators improve authentically with age. At the age of 11 years old in comparison with young football players of 10 years old the quantity of juggling increased by 5,9 kicks ($t_1,2=0,80$) ($p>0,05$), from 11 till 12 years old on 17,3 kicks ($t_{2,3}=2,37$; $p<0,05$) (tab. 3).

Near it, indicators of a kick to a ball have positive dynamics on accuracy, but their changes are not considerable and doubtful ($p>0,05$) (tab. 4)

Quantitative team indicators. Results of the conducted researches are presented in tab. 5.

The total stops of a ball during games increases with the age from 10 till 12 years old (tab. 5). So, if the average quantity

Table 1

The comparative analysis of indicators of special technical preparedness of football players of 10-12 years old (n=24)

№	Control exercise (test)	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.	Dribbling, enclosing of supports, a shot at the goal, s	8,1±0,34	7,3±0,31	6,7±0,21
2.	Dribbling with enclosing of supports of 5 circles, s	0,41±0,03	0,62±0,02	0,81±0,06
3.	Juggling (quantity of times for 45 s)	35,3±4,57	41,2±5,61	58,5±4,65
4	Kick of a ball on the accuracy (quantity of hits)	2,2±0,36	2,55±0,48	2,85±0,42

Table 2

Matrix of statistical reliability of special technical preparedness of football players of 10-12 years old (n=24)

Age	10		11		12	
	t	p	t	p	t	p
10	–		1–1,73 2-5,82	1>0,05 2-<0,001	1–3,05 2–6,32	1–<0,01 2–<0,001
11	–	–	–		1–2,13 2–3,01	1–<0,05 2–<0,01

Notes. *1 – maintaining, enclosing of supports, shot at the goal; 2 – dexterity of ball handling.*

Table 3

Matrix of statistical reliability of indicators of juggling of football players of 10-12 years old

Age	10		11		12	
	t	p	t	p	t	p
10	–		0,80	>0,05	3,55	<0,001
11	–	–	–		2,37	<0,05
12	–	–	–	–	–	

Table 4

Matrix of statistical reliability of indicators of a kick on the accuracy of football players of 10-12 years

Age	10		11		12	
	t	p	t	p	t	p
10	–		0,61	>0,05	1,25	>0,05
11	–	–	–		0,47	>0,05
12	–	–	–	–	–	

of stops of a ball by team players in 10-years-old age makes 77,4±11,3 for a game, in 11 years old – this indicator makes already 94,2±14,7 that is on 22,2% more, and at the age of 12 years old this indicator increased till 118,3±12,4 which gain put 25% in compared from 11-years-old (tab. 5). It should be noted that results of a reception of a ball have authentically the lowest indicators (t=2,5; p>0,05) in comparison between 10 and 12 years old football players (tab. 5).

Similar dynamics is traced when performing short passes forward (tab. 5). So, if sportsmen in 10 years old use 61,1±5,6 short passes forward on average for a game, already this indicator made 71,2±6,2 in 11 years old, and it increased to 85,4±7,3 in 12 years old. Thus the gain in passes forward has reliable differences between 10 and 12 years old football players (t=2,50; p>0,05).

The tendency to increase is stored when performing average passes back, across and forward by football players of 10-12 years old (tab. 5). So, football players of 10 years old use on average for a game 8,5±2,2 of passes back and across a field, 7,3±3,6 – passes forward, in 11 years old – 9,3±2,7 – passes back and across a field, 12,3±2,5 – passes forward, however in 12 years old – 11,2±3,1 – passes back and across, 13,8±2,9 – passes forward (tab. 5).

The analysis of a performance of long passes back, across and forward from 10 to 12 years old showed the essential increase to a number of these technical actions in the competitive practice of young football players (tab. 5). So, the average quantity of passes back and across a field at football players of 10 years old makes 0,8±0,22 on average for a game, in 11 years old this indicator increased to 2,3±0,73, and in 12 years old – 5,2±1,8. Results of use of long passes forward make 0,6±0,25 on average for a game at sportsmen of 10 years old, in 11 years – 1,1±0,21, and this indicator makes 3,2±1,21 in 12 years old.

The analysis of the results received when performing long passes back and across, found out that young football players of 12 years old carry out these passes in comparison from 10 years old authentically more (t=2,42; p>0,05) (tab. 5).

The quantity of enclosing of the rival on average for a game increases and makes – 12,2±4,5 in 10 years old, in 11 years

Table 5

Team quantitative indicators of the competitive activity of young football players from 10 till 12 years old, 18 games (n=24)

№	Technical-tactical actions	10 years old (n=8)	11 years old (n=8)	12 years old (n=8)	$p_{1,2}$	$p_{2,3}$	$p_{1,3}$
		$\bar{X}_1 \pm m_1$	$\bar{X}_2 \pm m_2$	$\bar{X}_3 \pm m_3$			
1.	Reception of a ball	77,42±11,3	94,2±14,7	118,3±12,4	>0,05	>0,05	<0,05
2.	Short passes back and across a field	54,3±4,7	52,7±4,5	51,2±4,3	>0,05	>0,05	>0,05
3.	Short passes forward	61,1±5,6	71,2±6,2	85,4±7,3	>0,05	>0,05	<0,05
4.	Short passes	115,4±12,5	123,9 ±15,34	136,6±16,4	>0,05	>0,05	>0,05
5.	Average passes back and across	7,3±3,6	9,3±2,7	11,2±3,1	>0,05	>0,05	>0,05
6.	Average passes forward	8,5±2,2	12,3±2,5	13,8±2,9	>0,05	>0,05	>0,05
7.	Average passes	15,8±1,3	21,6±3,4	25,3±4,2	>0,05	>0,05	>0,05
8.	Long passes back, across	0,8±0,22	2,3±0,73	5,2±1,8	>0,05	>0,05	<0,05
9.	Long passes forward	0,6±0,25	1,1±0,21	3,2±1,21	>0,05	>0,05	>0,05
10.	Long passes	1,4±0,5	3,3±1,1	8,4±2,3	>0,05	>0,05	<0,05
11.	Dribbling	71,1±7,1	68,3±5,7	55,2±5,1	>0,05	>0,05	>0,05
12	Interception, single combats, selection	78,2±5,2	69,1±4,8	61,1±4,3	>0,05	>0,05	<0,05
13.	Enclosing	12,2±4,5	15,9±3,6	19,4±4,8	>0,05	>0,05	>0,05
14.	Shots by a foot at the goal	7,3±1,5	8,4±1,8	9,3±1,9	>0,05	>0,05	>0,05
15	Shots by a head at the goal	0,3±0,02	0,8±0,07	1,4±0,9	<0,01	<0,01	<0,01
	In total	324,6±12,3	407,1±14,6	433,2±13,8	<0,01	>0,05	<0,01

old this indicator increased to 15,9±3,6 for a game, and in 12 years it made 19,4±4,8, but these changes weren't reliable.

The number of performance of shots at the goal by a foot and a head is increased (tab. 5). So, in 10 years old the indicator makes: shots at the goal by a foot – 7,3±1,50, shots at goal by a head – 3±0,02; in 11 years old these indicators increased to 8,4±1,8 – shots at the goal by a foot and 0,8±0,07 – shots at the goal by a head.

It should be noted that with the age the number of performance of kicks to a ball by a head authentically increases between football players of 10 and 11 years old (t=6,86; p>0,01), between 11 and 12 years old (t=5,26; p>0,01), between 10 and 12 years old (t=11,93; p>0,01) (tab. 5).

However, despite of a positive increase in the specified indicators, among total of TTA there are receptions which tend to deterioration at football players of 10-12 years old. They are first of all short passes back and across a field and maintaining. In our opinion and on the basis of the made by us observations the percentage ratio of number of these receptions decreases with age.

So, the analysis of average values of quantity of short passes back and across during the competitive activity showed that young football players at the age of 10 years old carry out on average for a game: passes back and across – 54,3±4,7, in 11 years old this indicator makes 52,7±4,5, however in 12 years old – 51,2±4,3. The same tendency is observed and when using dribbling on average for a game (tab. 5). So, for example, this indicator makes 71,1±7,1 in 10 years old, in 11years old – 68,3±5,7, and it decreased to 55,2±5,1 in 12 years old.

The similar dynamics is traced in single combats. So, football players of 10 years old carry out 78,2±5,2 single combats on average for a game, in 11 years old – 69,1±4,8, and in 12 years old – 61,1±4,3.

It should be noted that football players of 10 years old carry out authentically more single combats for a ball in comparison from sportsmen of 12-years old (t=2,53; p>0,05) (tab. 5).

The analysis of total amount of team technical and tactical actions during the competitive activity showed that this indicator increases with age (tab. 5). So, in young football players of 10 years old carry out 324,6±12,3 TTA on average for a game, this indicator made 407,1±14,6 in 11 years old age, and in 12 years old – 433,2±13,8. Thus, young football players of 11years old in comparison from 10 years old have authentically the highest results (t=4,32; p>0,01). Also young football players of 12 years old have still big quantitative indices in comparison with 10 years old from a total of TTA for a game (t=5,87; p>0,01).

Conclusions:

1. Quantitative indicators of technical preparedness of young football players increase every year. So, indicators of " enclosing of supports with the subsequent shot at the goal" improved on 0,8 s (t=2,13; p <0,05) from 11 till 12 years old, "dribbling with enclosing of 5 circles" from 10 till 11 years old on 0,21 s (t=5,82; p <0,001), "in juggling by a ball" from 11 till 12 years old on 17,3 kicks (t=2,37; p <0,05).

2. Total amount of the team technical and tactical actions (TTA) increases with age during the competitive activity. Young football players at the age of 10 years old carry out 324,6±12,3 TTA on average for a game (p>0,05), this indicator made 407,1±14,6 TTA in 11 years old age (p<0,01), and in 12 years old – 433,2±13,8 TTA (p>0,05).

Prospects of the subsequent researches: the definition of competitive characteristics according to each role from 10 till 12 years old.

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