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Theory & Practice of Physical Culture

Athletic training | Sport psychology | Academic physical education | Sport physiology

Improvement of legislation in children and youth sport

From January 2023, Federal Law No. 127 of April 30, 2021 «On Amending the Federal Law "On Physical Culture and Sports in the Russian Federation" and the Federal Law "On Education in the Russian Federation"» came into force in Russia. The adopted normative document is aimed at harmonizing the legislation on physical culture and sports and the legislation on education in relation to sports training and at creating conditions for the comprehensive development of children, improving their sportsmanship in children's and youth sports organizations, regardless of their departmental affiliation.

To eliminate and prevent disagreements in understanding the essence of harmonization of the normative base of sports training, it is proposed to improve the conceptual apparatus used in the legislation of the Russian Federation, including the clarification of the concept of «children's and youth sports» and «sports training». The federal law provides that youth sports cover persons under the age of 18. It is established that sports training is an educational and training process carried out within the framework of educational or labor activity.

It is important to note that the Federal Law will allow all organizations providing sports training for children and youth, regardless of departmental affiliation, to work according to uniform rules established by the legislation on education and on physical culture and sports, while maintaining the leading role of the Russian Ministry of Sports in regulating the organization and implementation of sports training as an educational and training process.

The transitional period in the implementation of legislation on the harmonization of sports training and the field of education makes it possible to adapt the management systems of educational and sports activities to the proposed changes in local regulations, additional educational programs for sports training, and changing the legal status of the position «coach».

We invite scientists to publish the results of scientific research aimed at improving the legal framework and methodological support for the sphere of physical culture and sports.

Editor-in-Chief of TPPC,
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Theory and Practice of Physical Culture

Contents

Preparation of future specialists in the field of life safety and physical culture for professional activities in the conditions of society digitalization

UDC 37.026

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Abstract

Objective of the study was to identify the readiness of future life safety teachers and specialists in the field of physical education to carry out their professional activities using digital educational technologies.

Methods and structure of the study. Experimental testing was carried out at the FSBEI HE "Bunin Yelets State University". The sample consisted of 100 subjects (control and experimental groups). The reliability of the obtained data was checked using the Mann-Whitney U-test.

Results and conclusions. In the educational process with the students of the experimental group, the method of practice-oriented learning was used with the use of modern information, interactive technologies and digital tools. They have been integrated into the process of vocational training and continuing education. The control group of subjects followed the traditional training route.

On the basis of a comparative analysis of empirical data and statistical analysis, a positive trend was established in the development of the information and communication criterion indicator of readiness that we identified among the students of the experimental group. The difference between the studied parameters in the subjects of the experimental and control groups was determined at a significance level of $p \leq 0.05$.

Keywords: *digital competence, future life safety teacher, specialist in the field of physical culture, professional training.*

Introduction. Digitalization has firmly entered almost all spheres of activity of modern man, which is explained by the processes of globalization and digitalization that are actively taking place today. It directly affected the system of higher professional education, stimulating personnel training in the field of life safety and physical culture based on modern information and digital technologies for high-quality problem solving in subsequent professional activities.

Digital transformation in higher education is understood as a complete restructuring of the learning process, a change in teaching methods and means, modernization of the model for the formation of professional competencies based on the use of modern digital information technologies, covering almost all content aspects [2].

At the same time, there is a problem of understanding by students the essence of the digitalization of education, which is the subject of the study by E.V. Frolova and O.V. Rogach [3]. It focuses on the importance of having digital literacy, that is, the skills to use information and communication technologies in modern realities. The new conditions for the activity of a future specialist in the digital environment entail certain difficulties, and in order to level all possible problems, it is necessary to master special competencies. In this regard, when preparing future specialists in the areas of training "Pedagogical education" (profile: Physical culture, Life safety) and "Physical culture" (profile: Sports training and physical culture and health work), special importance should be given to the competencies of the digital economy [1].

Taking into account all the positions indicated above, today it is very important to talk about the purposeful and structured training of specialists in the

field of life safety and physical culture to use modern information and digital technologies, which will subsequently allow them to solve a number of professional tasks, demonstrating a high level of digital literacy.

Objective of the study was to identify the readiness of future life safety teachers and specialists in the field of physical culture to carry out their professional activities using modern information and digital educational technologies.

Methods and structure of the study. Students of the training profiles "Physical Education, Life Safety", "Sports Training and Physical Education and Health Work" during their studies at the university should form competencies that testify to their digital literacy. The latter is a set of technical skills for searching, processing, storing, creating, presenting and communicating information exchange. In this regard, such training involves the following approach: the creation of an information and communication environment of an educational institution and the passage of additional professional education courses for students on the use of modern information, communication and digital technologies.

In order to evaluate the results of the study, experimental work was carried out FSBEI HE "Bunin Yelets State University". The sample of subjects consisted of 100 students in the areas of training "Pedagogical Education" and "Physical Education". Half of them (50 people) were trained along the traditional route (control group), the second half (50 people) - taking into account the approach described above (experimental group).

When determining the readiness for professional activity in the context of the digitalization of society among students of the experimental and control groups, the main importance was attached to the degree of formation of one of the criteria indicators - information and communication. For this criterion indicator, their levels were distinguished - high, medium and low, presented in Table. 1.

When identifying the dynamics of development of the criterion indicator of readiness, we used tests that involve checking the required knowledge, questioning, a system of test tasks, and observation. Experimental activities were carried out during the year.

Table 1. *Description of the levels of the information and communication criterion indicator of specialist readiness*

Level of the criterion indicator	Content of the criterion indicator
High	– the ability to work in an information environment; – the ability to independently create their own media products and distribute them; – the ability to independently apply modern information and digital technologies in the educational process (for example, during practice);
Middle	– the ability to work in the information environment without critical comprehension of the information received; – the ability to create media products and distribute them with the help of teacher consultations; – the ability to apply modern information and digital technologies in the educational process with the help of teachers' consultations;
Low	– lack of practical skills in creating media products; – primitive interpretation of information obtained from the information environment; – lack of ability to apply modern information and digital technologies in the educational process, even with the help of teachers' consultations.

Table 2. *Comparative results of the formation of a criterion indicator of readiness at the ascertaining and control stages of the experiment*

Stages of the experiment	Levels of information and communication indicator					
	Low		Middle		High	
	CG	EG	CG	EG	CG	EG
Ascertaining	(36) 72%	(33) 66%	(8) 16%	(10) 20%	(6) 12%	(7) 14%
Control	(35) 70%	(8) 16%	(9) 18%	(26) 52%	(6) 12%	(16) 32%

Table 3. *Statistical processing of independent samples using the Mann–Whitney criterion (mean and standard deviation)*

Parameter	CG		EG	
	Before the EW	After the EW	Before the EW	After the EW
Level of the information and communication criterion indicator	0,40±0,69	0,42±0,70	0,48±0,73	1,16±0,68*•

Note: * – the difference of the studied parameter in the experimental group of subjects at the level of significance p≤0,05; • – the difference of the studied parameter in the experimental and control group subjects at a significance level of p ≤ 0.05.

Results of the study and their discussion. The proposed approach to preparing future specialists for their professional activities using information and digital educational technologies has shown its effectiveness in the course of an experimental study (Table 2). The data obtained allow us to draw conclusions about the positive dynamics in the formation of the readiness of the students of the experimental group to carry out professional activities using modern information and digital technologies.

The use of mathematical statistics proves that the participants of the control and experimental groups have significantly different indicators, while the test subjects of the experimental group have a significantly higher indicator after the experimental work (EW) carried out than before its implementation (Table 3).

Conclusion. The analysis of the results showed a positive trend in changing the level of formation of the proposed indicator of the readiness of future life safety teachers and specialists in the field of physical culture to carry out their professional activities using modern information and digital educational technologies. In general, the study gives reason to believe that at the present stage of the development of the education system, the strategic direction of training specialists should be the formation of highly qualified professionals capable of carrying out their professional activities in the digital environment and the digital economy.

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Features of the disposition of actors of the physical culture and educational space of the university in the new reality

UDC 37.013

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Abstract

Objective of the study was to diagnose the dispositions of the actors in managing the development of the physical culture and educational space in universities (hereinafter referred to as the PHESU) based on the generalization of the results of the empirical sociological research "Diagnostics of the management system of the physical culture and educational space of universities" conducted in 2018-2021.

Methods and structure of the study. The functioning of the PHESU and the quality of its management largely depend on the dispositions of its actors. In order to diagnose the management system for the development of the physical culture and educational space of the university, we organized a sociological study by the method of a questionnaire survey of the subjects of the federal educational institution of the Belgorod, Kursk and Lipetsk regions: student youth (n=1000), university teachers and researchers (n=300), as well as employees university administration (n=140). To solve the tasks of sociological research, a quota sample was used, which made it possible to build a micromodel of the general population - subjects of the PHESU Belgorod, Kursk, Lipetsk, Stary Oskol).

Results and conclusions. It is concluded that the disposition of the actors in managing the development of the physical culture and educational space of the university, at the moment, is rightfully considered not optimal, which leads to work on their improvement.

Keywords: *sports and educational space of the university, project management technology, dispositions, student youth, teachers and researchers, employees of the university administration.*

Introduction. The physical culture and educational space of a modern university is a complex of interrelated and interdependent institutions that provide health protection and physical development of the participants in the educational process through physical education and upbringing [1]. The main purpose of the functioning of the PHESU is to create and maintain conditions for meeting the needs for physical improvement, professional growth and development of not only students, but also teachers, researchers and employees of the university administration. The development of the s PHESU is aimed at improving the health and physical fitness of all its participants. [2]. Changes in the parameters of management of the physical culture and educational space of the university, first of all, are associated with a change in the dispositions of the actors of its management system and, accordingly, their group norms of behavior. This is an extremely complex socio-technological task due to a number of reasons: firstly, not all variables of the PHESU are amenable to managerial influence at the university level; secondly, there are value-normative barriers of group consciousness; thirdly, the use of social technologies has its limitations [3].

Objective of the study was to identify the views of the main actors in managing the development of the physical culture and educational space in universities (PHESU) about the state of its elements.

Methods and structure of the study. The basis of scientific work is the data obtained in the course of the sociological study "Diagnostics of the management system of the sports and educational space of universities" (2018-2021). In the course of a sociological study, the elements of the disposition of the subjects of the physical culture and educational space of the university were subject to diagnostics: 1) value orientations of the actors of the PHESU; 2) the goals of the actors of the PHESU; 3) awareness of actors about the goals of the PHESU; 4) the needs of the actors of the PHESU; 5) the interests of the actors of the PHESU. Also, an assessment was made of the material and technical base of the sports and educational space of the university, the forms of self-realization of the subject in the sports and educational space of the university, the organizational structure of managing the development of the sports and educational space of the university.

In the course of the study, the state of managing the development of the sports and educational space of the university was assessed, namely: 1) management methods; 2) features of the project approach to management; 3) barriers to the implementation of the project approach. To obtain an objective assessment of the state of managing the development of the sports and educational space of the university, the respondents were asked to rate these positions in the range from 1 to 10, where 1 is the lowest score, 10 is the highest score. On the basis of a survey of experts, we have determined a rating scale: up to 6 points - low; from 6 to 7 points - medium; from 7 to 10 points - high.

Results of the study and their discussion. Features of dispositions predetermine the specifics of group norms of behavior in the physical culture and educational space of the university. For student youth, they are expressed, first of all, in the predominance of formal motivation for inclusion in physical education processes and limited activity. At the same time, there is an underestimation of physical education, combined with giving special importance to the possession of a beautiful figure and physique. Only 35% of student youth indicate the desire to maintain good health as the main motive for physical education, while 40% show the desire to acquire a beautiful figure [4]. For teachers and researchers, episodic participation in sports and educational events is typical; for them, the prevailing norm is the ability to use sports and educational activities in the implementation of their personal and professional qualities, interaction with sports professionals. The dominant norm of behavior of university administration employees is the ability to maintain their own health while distancing themselves from active participation in mass sports and educational events. Despite the fact that 80% of teachers and researchers, as well as employees of the university administration, define health promotion and keeping fit as their main goal of physical education, only 33.2% of the focus group participants take part in sports and educational events. Thus, we can state the obvious non-optimality of the norms, which is largely (but, of course, not only) due to insufficient management efficiency.

The state of the material and technical base of the modern physical culture and educational space of the university, according to the majority of the participants in the study, meets their expectations. Student youth, as a rule, expresses general satisfaction with the state of the material and technical base of the sports and educational space of the university, so the overall average satisfaction score is 7.8 out of 10 maximum possible. The average assessment of satisfaction with the state of the material base of the PHESU by the employees of the administration was 7.7 points. However, they are dissatisfied with: 1) the lack of modern sports complexes in a number of universities that can satisfy all the sports interests of student youth; 2) insufficient amount of sports equipment; 3) lack of auxiliary facilities (washrooms and shower rooms).

All actors of the physical culture and educational space of the university are characterized by a fairly high level of awareness of the goals of the sports and educational space of the university, which is able to provide the necessary communication between the subjects and form a unified approach to achieve the goals. Almost half of the students surveyed (44.1%) believe that they have complete information regarding the goals and objectives of the functioning of the sports and educational space of the university. Almost the same number of students (42.8%) believe that they are partially informed. However, the situation in universities is characterized by the use of non-optimal communication channels within the sports and educational space of the university.

Teachers and researchers are generally satisfied with the existing organizational structure for managing the development of the PHESU, estimating it at 7.6 points out of 10 possible. At the same time, only 22.3% of teachers and researchers are completely satisfied with the currently used procedures for managing the development of the PHESU. A significant part of the respondents (43.3%) are partially satisfied with them. The technologies used are completely dissatisfied with only 10.7% of respondents. The greatest satisfaction in the organizational structure of the management of the development of the PHESU is the possibility of a variable choice of sports.

At present, the subjects of the physical culture and educational space of the university are characterized by low awareness of the possibilities of applying the project approach to managing the development of the PHESU, as well as their lack of a clear understanding of its essence and specifics in relation to the university. Only 52.3% of teachers and researchers have any information about the practice of the project approach to managing the development of the PHESU. The effectiveness of the project approach to the management of the development of the PHESU is estimated by the university administration at only 6.6 points out of 10 possible. It seems possible to consider the lack of consistency and consistency in the processes of implementing management methods, insufficient professional, primarily theoretical, training of management personnel, and an insufficient level of formalization of project management processes as the main barriers to the development of the management system of the PHESU.

Conclusions. The analysis of the results of diagnosing the dispositions of the participants of the physical culture and educational space of the university made it possible to formulate the following conclusions.

Firstly, the application of project management in the development of the PHESU is impossible without the close interaction of all its participants. The possibilities of using project management directly depend on the degree of interest in this technology of all participants in the PHESU. The level of demonstrated interest directly depends on the degree of involvement of the participants of the PHESU in the work with the project. Teachers and employees of the administration who personally participated in the development of the PHESU, using the technology of project management, treat it with greater loyalty. Overcoming the barriers to the application of project management technology is possible through the involvement of participants in the PHESU in long-term pilot projects that do not require cardinal changes in the employee's activities.

Secondly, the dispositions of the main institutions represented in the PHESU do not fully allow them to form the norms of group behavior, which are a set of rules that are mandatory for members of the group. Among the most important, a kind of "ideal" norms of group behavior in the PHESU are: 1) a high level of awareness; 2) the need for physical education activities; 3) interest in physical development; 4) participation in sports and educational events; 5) activity in sports and educational events.

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Memorial sports competitions: history, specifics, patriotic and local history aspects

UDC 796.799

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Abstract

Objective of the study was to analyze the problems of holding memorial and other personal sports competitions in the context of the history and specifics of their conduct, as well as patriotic and local history education of the younger generation.

Methods and structure of the study. In the scientific work, an analysis of information sources on the topic under consideration was carried out; analysis of the history of sports in the city of Yelets (mid-19th century - present) in the context of the problem under consideration; generalization of many years of personal experience in holding memorial competitions.

Results and conclusions. The conducted studies (on the example of the city of Yelets) made it possible to analyze the historical aspects of holding memorial and other personal sports competitions, to determine the factors associated with their holding. The main components of their educational (local lore and patriotic) resource are revealed: biographical information about the person to whom this event is dedicated; guests of honor; award paraphernalia; laying flowers at a memorial plaque, photograph, portrait, grave of a person to whom the competition is dedicated; the location of the memorial; information support of the memorial.

Keywords: *memorial sports competitions, history, specifics of holding, patriotic and local history education.*

Introduction. Russia is one of the leading sports powers. Each region of our country has its own sports heroes, on whose biographies it is possible to effectively carry out physical culture, sports, patriotic and local history education of the younger generation. One of the elements of this education system is memorial and other personal sports competitions dedicated to outstanding people. At the same time, as the analysis of the information space shows, the full potential of this form of work is not realized to the proper extent.

Objective of the study was to analyze the problems of holding memorial and other personal sports competitions in the context of the history and specifics of their conduct, as well as patriotic and local history education of the younger generation.

Methods and structure of the study. In the scientific work, an analysis of information sources on the topic under consideration was carried out; analysis of the history of sports in the city of Yelets (mid-XIX century – present) in the context of the problem under consideration; generalization of many years of personal experience in holding memorial competitions.

Results of the study and their discussion. Memorial competitions are competitions dedicated to the memory of outstanding athletes, as well as warriors, politicians, etc. In addition to memorial competitions, competitions dedicated to living people have become widespread. In our country, for many years, memorial tournaments dedicated to the brothers G.I. and S.I. Znamensky (athletics, held since 1958), I.M. Poddubny (classical wrestling, since 1953), Ya.F. Melnikova

(speed skating, since 1960), Yu.A. Gagarin (volleyball, held since 1968) and many others. Similar competitions are organized in other countries [2].

An analysis of the information space showed an almost complete absence of publications devoted to the problem under consideration. At the same time, the available sources note the importance of holding memorial competitions for the patriotic education of athletes. Acquaintance with sports heroes fellow countrymen not only equips modern athletes with valuable physical culture and sports knowledge of local lore, but also reduces the outflow of promising athletes from their small homeland [1, 3].

Below, using the example of the city of Yelets, a city with a rich sports history, we will analyze the problems of holding memorial and other personal sports competitions.

Memorial competitions and competitions in honor of living people in the city of Yelets began to be held starting from the second half of the 19th century. Thus, participants in trotting races competed for prizes dedicated to the memory of the vice-presidents of the city society "Trotting Run" I.D. Oznobishina, A.A. Petrov, the founder of the society M.A. Stakhovich. Races were organized in honor of the honorary member of the society, Count I.I. Vorontsov-Dashkov, vice-president of the society Count G.I. Ribopierre and others [4].

In the period 1935-1937 in the city of Yelets, a massive cross-country cross-country race was held annually in honor of the Soviet politician N.M. Shvernik [4].

Between the mid 1970s - early 1990s Yelets hosted five individual tournaments. Among them: two all-Union football tournaments dedicated to the residents of Yelsk - in memory of the pioneer, hero of the Great Patriotic War A. Oborotov and in honor of the master of sports of the USSR, member of the USSR national team O. Kopaev; two youth boxing tournaments dedicated to the memory of A. Vermishev (writer, hero of the civil war, died in the city of Yelets) and in honor of a Yeltsyan, Hero of the USSR G.D. Kurbatov; All-Union judo tournament dedicated to the memory of the Yelchanin, pioneer, hero of the Great Patriotic War V. Krayushkin.

The period from 1991 to the present is characterized by a large number of memorial tournaments and competitions dedicated to living people. During this period, 24 of them were held, namely: in judo - 6 competitions (dedicated to the memory of S. Makarov, A. Tyurin, S. Larin, S. Matveev, N. Butko); football - 5 (dedicated to the memory of A. Styushin, N. Makeev, V. Zatonsky, V. Milenin, etc.); in boxing - 3 (dedicated to the memory of S. Pyatnitsky, A. Dashchenko, O. Loskov); in volleyball - 3 (dedicated to the memory of Yu. Polukhin, G. Filippov, N. Ogarkov); in basketball - 2 (dedicated to the memory of M. Kolokolin, E. Frolikov); in urban sports - 2 (dedicated to the memory of I. Kuvshinov, for the prizes of V. Karasev); in athletics - 1 (for the prizes of A. Piskulin); hockey - 1 (dedicated to the memory of G. Shiryaev); in karate - 1 (dedicated to the memory of S.D. Suskin).

Let's name the memorial competitions, the initiators and organizers of which we were. These are interregional judo competitions dedicated to the memory of the master of sports of the USSR, coach S.V. Makarov. The tournament has been running from 2013 to the present, i.e. about 10 years. In 2020, due to the spread of the COVID-19 coronovirus infection, the tournament was held online (technical demonstration). Open regional festival of martial arts (sambo, judo, Greco-Roman wrestling, freestyle wrestling), dedicated to the memory of the Elchanin, the first Russian Olympic medalist A.P. Petrov, runs from 2020 to the present. Regional football tournament dedicated to the memory of the founder of the football club "Eaglet" N.N. Makeev, runs from 2018 to the present. In 2021, a midi-football tournament was held dedicated to Yelsk athletes, participants in the Second World War V.T. Frenzel, A.F. Ivanov, I.U. Efanov.

An analysis of the memorial and other personal sports competitions held in Yelets allows us to draw a number of conclusions:

- the history of such competitions dates back to the 19th century;

- the largest number of competitions falls on the stage from 1991 to the present;

- in the overwhelming majority of cases, tournaments are dedicated to athletes (27 personalities), with less frequency tournaments are held in honor of soldiers (6 people), rarely - in honor of political figures (1 person);

- the organizers of memorial tournaments are sports schools and other sports organizations (sports societies, sports federations), general education schools, secondary professional organizations, universities, students and associates of the persons in whose honor the competitions are held;

- the number of memorial tournaments held by sports correlates positively with the level of their development in the Yelets region. At the same time, it can

be stated that for some sports that have been cultivated for many years in the city of Yelets, no memorial tournaments are held. Among them are sambo, chess, skiing, table tennis, weightlifting, etc.;

- the longest time - about 20 years, there are memorial judo tournaments dedicated to the memory of A. Tyurin, S. Matveev, N. Butko. The duration of the tournaments is influenced by many factors, including the authority of the person to whom the memorial is dedicated, changes in the political structure of the country's development, the sponsorship aspect, the change of sports generations, various human factors, etc.;

- in the history of sports in the city of Yelets there are people who have made a significant contribution to its development, but for various reasons have not been honored with holding nominal competitions. In our opinion, A.A. Stakhovich (tennis), G.I. Ribopierre (complex competitions), A.E. Sokolova (sambo, judo), A.T. Kharchenko (sambo, judo and other sports), etc.

The main components of patriotic and local lore education of memorial competitions are:

- biographical information about the person to whom this event is dedicated. It is advisable to provide this information in the process of opening the tournament by the hosts, in the format of watching a short video. It is also important to use banners and other stands with information about the hero of the event;

- guests of honor. As guests of honor, it is advisable to invite relatives, pupils and colleagues of the person in whose honor the memorial is being held;

- award attributes. Medals, certificates, cups, etc. must be made using photographs, drawings, symbols, personifying the hero of the memorial. As an example of the original approach used in award paraphernalia, there is a charter book. This approach was invented and used by us during the tournament dedicated to the memory of S.V. Makarov. One of the first pages of the book about S.V. Makarov has become an official diploma, statistics of previous memorials are given at the end of the brochure. This approach allows you to combine the award material and the information and biographical component;

- laying flowers at a memorial plaque, photograph, portrait, grave of the person to whom the competition is dedicated is an effective educational tool;

- place of the memorial. This aspect also affects the emotional effect of the competition. So, for example, in 2022 we planned to hold a martial arts festival dedicated to the memory of A.P. Petrov in Petrovsky Park in Yelets. This place is associated with the family of A.P. Petrov and sports competitions of wrestlers, previously held in the park;

- information support of the memorial. Production of tournament posters (printed, electronic) with a brief curriculum vitae, online broadcast of the memorial allow to increase the coverage of participants and spectators of the competition. Photo and video filming of the tournament with the subsequent placement of the information received in the media and social networks will also contribute to this.

Conclusions. The conducted studies (on the example of the city of Yelets) made it possible to analyze the historical aspects of holding memorial and other personal sports competitions, to determine the factors associated with their holding, to identify the main components of their educational (local history and patriotic) resource.

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Development of national army hand-to-hand combat as a sport

UDC 796.85

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Abstract

Objective of the study was to substantiate the stages of development of army hand-to-hand combat as a sport in Russia.

Methods and structure of the study. The scientific work used the analysis and generalization of scientific literature, statistical data, the practice of organizing army hand-to-hand combat (AHHC); specific methods of the history of pedagogy: historiographic, determinant-genetic and problem-genetic analyzes of the problem.

Results and conclusions. Historical analysis has shown that the process of formation and development of sports army hand-to-hand combat is associated with socio-political and economic transformations in the USSR and Russia. During the development of periodization, the influence of the significance of historical, cultural, socio-political and economic factors in the development of our society and state, the idea of the gradual formation of individual elements of the AHHC was taken into account. Relying on the criterion "essential characteristics of army hand-to-hand combat as a unique system of martial arts" made it possible to identify the following stages of its development in our country: 1) 20s-70s XX century - the prerequisites for the emergence and the period of "hidden" development of the AHHC in line with the various types of existence of hand-to-hand combat in our country, primarily sambo; 2) 1979 -1995 - the period of emergence (the first championship of the airborne troops in the AHHC) and the formation of army hand-to-hand combat; the development of army hand-to-hand combat as a military-applied sport, its cultivation only in army units; 3) 1995 - 2016 - the progressive development of army hand-to-hand combat in Russia; cultivation of AHHC not only in army units, but also in police units, as well as in sports organizations; 4) 2016 - until now - the controversial nature of the development of army hand-to-hand combat in Russia: on the one hand, the increasing importance of the AHHC as a means of patriotic education of the younger generation, improving this sport (athletes' equipment, tactics, increasing the speed and dynamics of combat, increasing entertainment of duels, quantitative development of competitions, etc.) AHHC; and on the other hand, an increase in the competition of the AHHC from other types of martial arts; reduction in the number of children involved in AHHC.

Keywords: *stages of development, Russia, kind of sport, army hand-to-hand combat.*

Introduction. Since its inception in 1979, the domestic army hand-to-hand combat (AHHC) as a sport has deeply rooted among the "military and civilian population" of our country, determined the development of a number of types of martial arts in Russia [1, 2]. Dramatic geopolitical events of recent times have actualized the importance of the AHHC as an effective means of patriotic education of youth. In the face of a potential threat of external aggression, one of the main directions of the country's policy is the active preparation of young people for military service [4]. Since the issue of periodization of the history of the development of AHHC in Russia has not yet been reflected in the scientific literature, the isolation of the stages of development of this sport is of undoubted research interest.

Objective of the study was to substantiate the stages of development of army hand-to-hand combat as a sport in Russia.

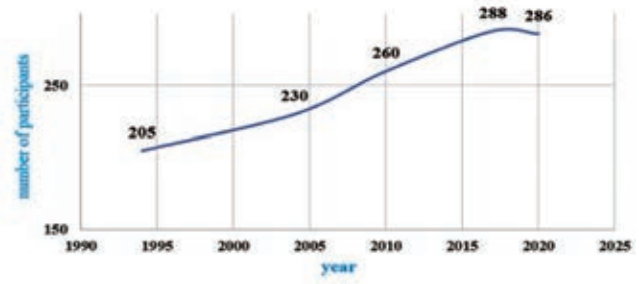
Methods and structure of the study. The scientific work used the analysis and generalization of scientific literature, statistical data, the practice of organizing army hand-to-hand combat; specific methods of the history of pedagogy: historiographic, determinant-genetic and problem-genetic analyzes of the problem.

Results of the study and their discussion. Historical analysis has shown that the process of formation and development of sports army hand-to-hand combat is associated with socio-political, economic and cultural transformations in the USSR and Russia. During the development of periodization, the influence of the significance of historical, cultural, socio-political and economic factors in the development of our society and state, the idea of the gradual formation of individual elements of army hand-to-hand combat was taken into account. Relying on the criterion "essential characteristics of army hand-to-hand combat as a unique system of martial arts" made it possible to identify the stages of its development in our country.

The chronological framework of the ***stage of prerequisites*** for the emergence and the ***period of "hidden" development*** of army hand-to-hand combat includes the 20s-70s XX century. The historical fact of the end of the civil war in Russia (the beginning of the 1920s) was taken as the starting point of reference, and as the final point - 1979 - the holding in the USSR of the first championship of the Airborne Forces in AHHC. The historical prerequisites for the development of the sport under study are determined by the change in the socio-economic formation in Russia as a result of the socialist revolution of 1917. This entailed the creation of a national system of physical culture based on socialist ideology; improving the methods of preparing troops for hand-to-hand combat in the face of a changing nature of combat operations and the modernization of the army; the organization in the early 1920s of sports sections and societies, where methods of defense and attack without weapons were studied (in 1923, a self-defense section under the leadership of V. A. Spiridonov worked in the Dynamo sports society). The difficult military-political situation around the USSR, scientific and technological progress, forced us to look for effective ways to qualitatively prepare personnel for hand-to-hand combat.

The methodological component of the socio-cultural prerequisites is associated with the activities of such propagandists and organizers of martial arts as V.A. Spiridonov, A.A. Kharlampiev, V.S. Oshchepkov, N.N. Oznobishin, V.P. Volkov, A.A. Kadochnikov and others. Appearance in the 70s-80s in the USSR, numerous underground sections "karate", "combat sambo", the development of the school of martial arts (A.A. Kadochnikov, G.V. Popov, T.R. Kasyanov, etc.) gave an impetus to the further development of martial arts. The period of emergence (the first championship of the Airborne Forces in the AHHC in 1979) and the formation of army hand-to-hand combat (1979-1995) is characterized by the development of army hand-to-hand combat as a military-applied sport, its cultivation only in army units. In 1985, army hand-to-hand combat was included in the Unified Sports Classification as an independent sport, and in 1989 it was introduced into the Armed Forces of the Russian Federation as a military-applied sport, which made it possible In 1991, to hold the 1st championship of the Armed Forces of the USSR in army hand-to-hand combat in Leningrad. In 1992, under the auspices of the Army Association of Contact Types of Martial Arts, the Federation of Army Hand-to-Hand Combat was created, and since 1994 championships of the Russian Federation among young men have been held [3, 5]. The ***stage of progressive development*** of army hand-to-hand combat in Russia (1995 - 2016) was distinguished by the creation of its *regulatory framework* as a result of the adoption of a number of Federal laws (1998 and 2007), the Decree of the Government of the Russian Federation (2009), the Decree of the President of the Russian Federation (2012), the order of the Minister of Defense of the Russian Federation (2013), substantiation of rank norms and requirements for the assignment of sports ranks (titles), clarification of the conditions and rules for holding competitions in military-applied sports (2015), etc. In addition, important *organizational events* took place: in 1995, the all-Russian public organization "Federation of Army Hand-to-Hand Combat of Russia" was created; in 1993-1996 army hand-to-hand combat was included in the military sports classification, and in 1997-2000 - in the Unified All-Russian Sports Classification. During the period under review, AHHC was cultivated not only in army units, but also in police units, as well as in sports organizations. The coverage of the regions of distribution of AHHC increased from 52 to 63 with a simultaneous increase in the number of people involved up to 500,000 people in 2010. Along with this, in 2007-2016 actively developed children's and youth army hand-to-hand combat. The creation in 2016 of the “Sports Federation of Army Hand-to-Hand Combat of Russia” became a milestone in a new, albeit ***contradictory*** in nature, ***stage in the development*** of this sport. On the one hand, the process of the immanent development of army hand-to-hand combat as a sport continued: the equipment of athletes was improved (AHHC is one of the toughest sports), the tactics of combat, its speed and dynamics increased,

the entertainment of fights increased, the number of competitions increased (see figure) and others. Objectively, the importance of army hand-to-hand combat as an effective means of patriotic education of the younger generation increased.



Dynamics of the number of participants in the Russian Championships in AHHC for 1994-2020

On the other hand, increased competition in AHHC from other types of martial arts, the inability to officially assign junior sports categories to athletes at the age of 7 to 14 years, leads to a reduction in the number of children involved in this martial art.

Conclusions. The historical and pedagogical grounds for the periodization of the formation and development of AHHC as a sport in Russia are determined. The proposed periodization made it possible to trace the features of the formation and development of domestic army hand-to-hand combat as a sport against the backdrop of economic, political, socio-cultural determinants of the development of our country. The revealed prerequisites for the formation of army hand-to-hand combat complement the ideas about the development of martial arts in the Soviet period and the role of objective and subjective factors in the formation of the Soviet system of physical culture and sports. Reconstruction of the periods of development of AHHC shows that by the beginning of the XXI century AHHC in Russia began to have all the characteristics and elements inherent in the sport. The synchronous analysis of the selected periods makes it possible to identify the prospects, directions and optimal conditions for improving the sports army hand-to-hand combat in Russia.

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Modern trends in the development of competitive activities in aikido in russia

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Abstract

Objective of the study was to identify trends in the development of aikido in Russia based on the analysis of the results of competitive activity.

Methods and structure of the study. The work was carried out as part of the research activities of the National Aikido Council of Russia. Representatives of the Regional Public Organization "Belgorod Interstyle Aikido Federation" and teachers of "Belgorod State National Research University" took part in it. An analysis was made of the protocols of the Russian Aikido Championships and competitions for the Aikido Cup in 2020-2022.

Results of the study and their discussion. All-Russian aikido competitions are held in the following competitive disciplines for both men and women: kihon-waza (doubles), jui-waza (doubles), jui-waza (group category). The hypothesis is considered that in recent years, more and more young athletes under the age of 21 have been winning competitions. As the study showed, the winners and prize-winners of aikido competitions among women are indeed becoming more and more young athletes, but the bulk of the participants in the competitions are women about 30 years old. Tendencies for rejuvenation of all participants of the competition were not revealed. In men, the bulk of the participants in the competition are on average 10 years older than in women, however, younger winners and prize-winners also appear there. The number of regions participating in competitions has decreased markedly due to the changing conditions for playing sports.

Keywords: *aikido, competitions, athletes, trends, Russia.*

Introduction. Morihei Ueshiba, the creator of aikido, did not think about transforming it into a new type of competition [5]. Having appeared in Russia, Japanese aikido became very popular and received comprehensive development [2-4]. At present, it has been transformed into volumes of aikido and is already making its own history in Russian sports [1]. Competitions are the most important attribute of any sport, including aikido. They demonstrate the level of its development, sports achievements, the result for a certain period of development and new trends. Therefore, the analysis of the results of the All-Russian competitions in aikido in order to identify new trends in competitive activity seems to be relevant.

Objective of the study was to identify trends in the development of aikido in Russia based on the analysis of the results of competitive activity.

Methods and structure of the study. The article analyzed the protocols of competitions in Russia in aikido among women and men. The attention of the study was directed to the age of the participants in the competitions, trends in its dynamics, as well as to the geography of the regions participating in the competitions. Athletes' ages have been studied in order to try to determine when is the optimal period for achieving maximum results in aikido, as well as to identify the typical age period among the main body of practitioners.

The protocols of the competitions of participants and winners of the Russian Aikido Championships (2020, 2021) and Russian Cups (2021, 2022) have been studied. These competitions have become the main aikido competitions in Russia, given the current epidemiological and international situation. It was for these competitions that athletes and coaches pre-

pared most responsibly, and therefore the indicators of these competitions are the main ones in past seasons. In a comparative analysis, methods of mathematical statistics were used, in particular, the identification of significant differences according to the Student's t-test between the age data of the participants in the competition. In addition, a survey of coaches and observation was used. For comparison, data on the age of the participants in the competition, winners and prize-winners, and the first best 10 results were taken from the protocols. The places taken in the competitions of women and men were compared, then they were correlated with the age of the participants in the competition.

Results of the study and their discussion. One of the trends noted by coaches and judges during the period of the aikido competitions in Russia under consideration was the rejuvenation of the winners and prize-winners of the most important competitions over a three-year period. First of all, it concerns women's competitions. This trend is typical for many sports, but the assertion of such a trend requires evidence. In table. 1 compares the age indicators of women who took the first three places in the Championships and Cups of Russia in aikido for 2020-2022.

As you can see, at the Russian Championship 2020, due to the age-old athlete who took third place in the discipline of kihon-waza, as well as athletes aged 27, the age indicators were the highest for the period under review. At the Russian Championship in 2021, the youngest participants in the competition (aged 19 to 26 years) became the winners. In the same year, athletes of almost the same age (from 19 to 31 years old) won the Russian Cup. However, in 2022, the age level of the winning athletes again slightly increased (up to 32 years). When comparing the age of the first 10 best athletes of different competitions and different years of their holding, no significant differences between groups of women were found at $p<0.05$. Therefore, there are no grounds to believe that a steady, reliable rejuvenation of participants and winners of aikido competitions in Russia is really taking place in Russia.

According to Table 2, male aikido winners are noticeably older than female aikido practitioners. Particularly stands out is the composition of the winners of 49-50-year-old athletes at the 2021 Russian Championship and the Russian Aikido Cup of the same year. But in the 2022 Cup of Russia, the average age of the winners of the competition has dropped sharply to 20-30 years. And this is already a trend. It is very noticeable and probably has a historical significance (probably there is a change of generations of leading athletes, because out of 9 prizes 6 were won by aikidokas aged 19-22).

At the same time, an attempt to identify significant differences between the first 10 best male participants in the jui-waza discipline, who performed at the Russian Championship in 2021 and the first 10 best participants in the same discipline at the Russian Cup in 2022, did not give the expected results. Significant differences at $p<0.5$ between the indicated groups were not found.

In another hypothesis, it was assumed that there should be significant differences between the age indicators of female and male athletes, but the calculations showed that there are none either. This is explained by the following circumstance: the winners and prize-winners of the competition differ significantly from the rest of the mass of athletes in many cases - in each group there is a large variability of values. At the same time, the appearance of younger winners among men and women can be regarded as a signal indicating the beginning of a change in traditional leaders of the competition and intensification of competition in subsequent competitions. This is an important con-

Table 1. *Comparison of the age of winners and prize-winners of the Aikido competition among women at the championships of Russia (ChR) of 2020-2021 and Russian Cups (RC) 2021-2022*

Competitive discipline	Discipline code	Возраст (лет)											
		2020 - RCh			2021- RCh			2021- RC			2022- RC		
Kihon-waza - doubles	0700011811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		27	20	46	19	26	19	26	19	19	19	27	22
		M= 31			M= 21			M= 21			M= 22		
Jui-waza - doubles	0700021811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		20	27	20	19	19	19	19	21	31	19	20	32
		M= 22			M= 19			M= 23			M=23		
Jui-waza - group category	0700031811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		25	20	27	22	20	25	21	19	19	20	19	32
		M= 24			M= 22			M= 20			M= 23		

Table 2. *Comparison of the age of winners and prize-winners of aikido competitions among men at the Russian Championships 2020-2021 and Russian Cups 2021-2022*

Competitive discipline	Discipline code	Age (years)											
		2020- RCh			2021-RCh			2021- RC			2022- RC		
Kihon-waza - doubles	0700011811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		48	23	30	49	44	38	50	19	42	33	20	38
		M= 33			M= 43			M= 37			M= 30		
Jui-waza - doubles	0700021811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		39	42	20	49	50	37	50	21	19	19	22	19
		M= 33			M= 45			M= 30			M=20		
Jui-waza - group category	0700031811Ya	I	II	III	I	II	III	I	II	III	I	II	III
		48	32	24	34	34	23	50	19	42	19	19	41
		M= 34			M= 30			M= 37			M= 26		

clusion for all coaches working in the field of sports aikido. Another trend concerns the development of aikido in the regions of Russia. This factor shows the geography of the development of the sport, the intensity of its functioning in different regions of the Russian Federation. Table 3 presents the first 10 regions of Russia that participated in the above competitions.

Table 3 shows how the geography of the regions participating in the main competitions is gradually narrowing, among which the regions of the central part of Russia remain mainly. This is probably due to the consequences of the pandemic and the tense international situation. At the same time, I would like to hope that the most reliable regions will remain active and new entities will join them in the coming years, which will contribute to the further development of aikido in Russia.

Conclusions. The study of the results of all -Russian Aikido competitions showed that athletes under the age of 22 began to win the competitions more and more often in competitions. Of the 9 possible awards, women aged 19-21 were won in 2020 at the Aikido championship of 4 medals, in 2021 6 medals, at the Russian Cup in Aikido in 2021, out of 9 awards, they won 7 medals, in 2022, 5 medals. However, the bulk of competing athletes is about 30 years old. When

Table 3. *Comparison of regions leading in the Russian Championships 2020-2021 and Russian Cups 2021-2022 (in competitions among men - the first 10 places)*

Competitive discipline	Subjects of the Russian Federation			
	2020- RCh	2021- RCh	2021-RC	2022-RC
Kihon-waza - doubles	Orenburg region, Kursk region, Tula region, Belgorod region, North Ossetia, Ulyanovsk region, Samara region, Moscow, Moscow region	Orenburg region, Moscow, Belgorod region, Kamchatka region, Sverdlovsk region, Kursk region, Tula region.	Moscow, Tula region, Kursk region	Tula region, Belgorod region, Kursk region, St. Petersburg
Jui-waza - doubles	Primorsky Territory, St. Petersburg, Tula Region, Kamchatka Territory, Orenburg Region, Belgorod region, Moscow, Kursk region, Saratov region, Kaliningrad region	Orenburg region, Moscow, Kamchatka region, Belgorod region, Tula region.	Moscow, Tula region, Kursk region, St. Petersburg, Oryol region.	St. Petersburg, Tula region, Belgorod region, Kursk region
Jui-waza - group category	Orenburg region, Moscow, Kursk region, Kamchatka region, Saratov region, St. Petersburg, Belgorod region,	Moscow, Krasnodar region, Moscow region, Ulyanovsk region, Republic of Mari El, Republic of Tatarstan	Moscow, Tula region	St. Petersburg, Tula Region, Belgorod Region, Kursk Region, Primorsky Territory

comparing the best athletes for 2020-2022. In Russia, there have been no reliable rejuvenation of participants and winners of all-Russian Aikido competitions among women that have not yet been revealed in Russia, which have not been identified in Russia.

Men among the winners of the Aikido competitions many athletes are older than women. The winners of the competition are men 30 years old and older, sometimes even at 50 years old. Since 2022, athletes of 19-20 years begin to win the competitions, which indicates the beginning of the change of sports generation.

The average age of the participants and winners of the All-Russian competitions in Aikido, as well as outlined age trends in this direction should be taken into account by trainers and other aikido specialists in Russia.

Analysis of the championships of Russia and Cups of Russia in Aikido shows that in 2020-2022. The geography of the regions participating in competitions has narrowed. The most active are the subjects located in the central part of Russia. It is necessary to make efforts to involve new Russian regions in competitive activities in Aikido, as well as develop international ties with foreign centers and specialists in Aikido friendly countries to preserve and strengthen competitive motivation among Russian athletes.

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Managing the training of a sports reserve in nordic combined in the conditions information and communication environment

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Abstract

Objective of the study was to develop a methodology for managing the training of a sports reserve in Nordic combined with the use of an information and communication environment.

Results and conclusions. A technique for managing the training of a sports reserve in Nordic combined based on an information and communication environment has been developed, implemented within the framework of a conceptual block that determines the theoretical and methodological foundations for managing long-term sports training, a diagnostic block that allows determining the current level of preparedness of athletes and features from morphofunctional and physical development, a block managerial influences aimed at making decisions by the coach on the advisability of making changes to the current plan of sports training and the training program of Nordic skiers, a control block that evaluates the effectiveness of the pedagogical influences proposed by the coach in the system of staged long-term training of Nordic skiers.

Keywords: *methodology, management, sports reserve training, information and communication environment, Nordic combined.*

Introduction. An analysis of theoretical materials and a generalization of practical experience made it possible to identify the problem of insufficient informatization of the preparation of a sports reserve in Nordic combined [1, 2, 3]. The established features of the training of Nordic skiers made it necessary to take them into account when developing an information and communication environment (hereinafter referred to as ICE) in order to objectively collect, process, store and analyze data on preparedness in order to identify the most promising and talented athletes at each stage of the long-term formation of sportsmanship. The ICE was developed by researchers and software engineers of the university within the framework of the relevant research work within the framework of the state task approved by the Ministry of Sports of the Russian Federation, Tchaikovsky State Academy of Physical Culture and Sports.

However, only the creation of an information and communication environment without an appropriate methodology based on systemic control and monitoring surveys and making changes to the training plan and program of Nordic skiers cannot ensure its integration and effective implementation in the conditions of a staged long-term training of a sports reserve in Nordic combined.

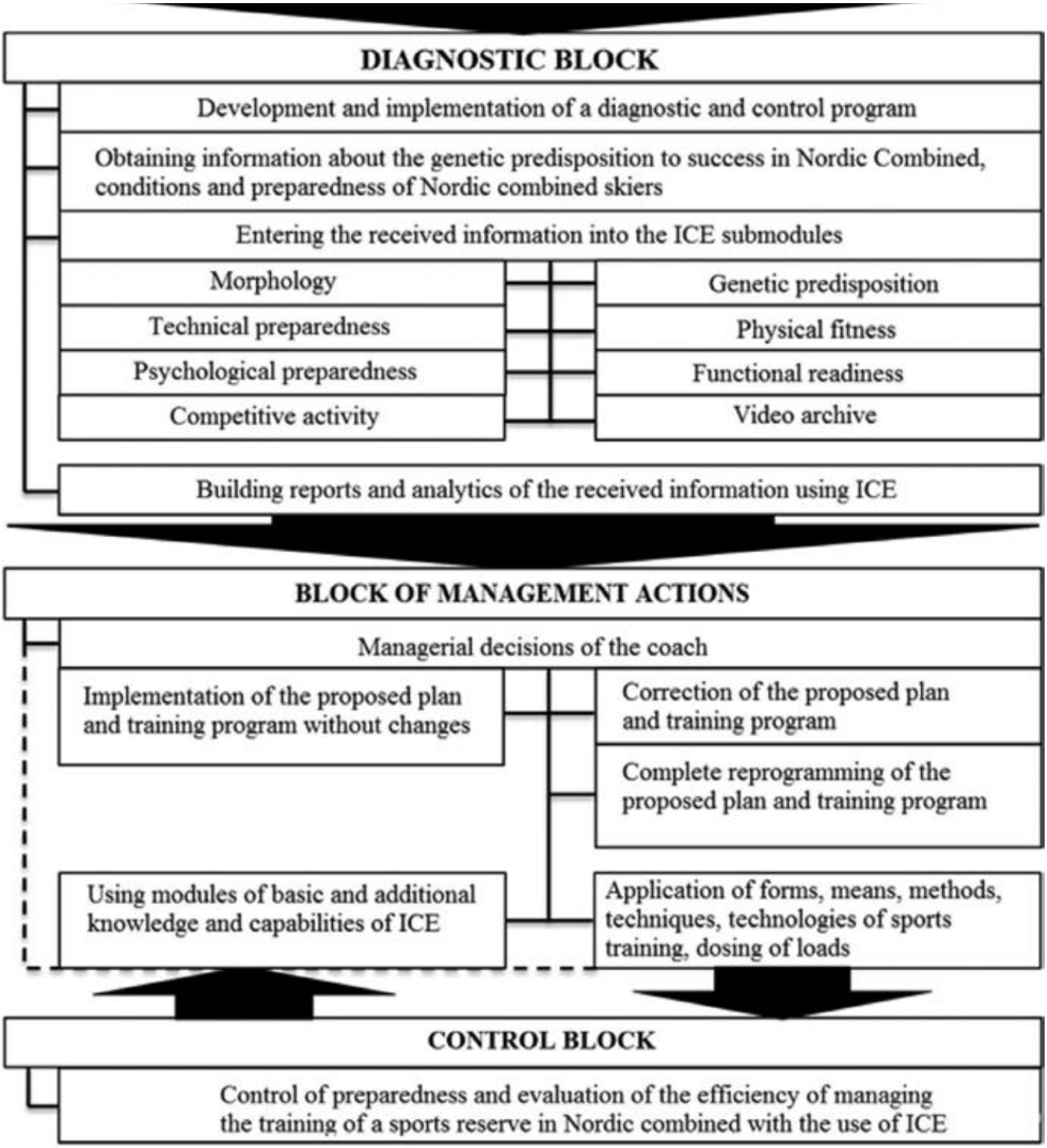
Objective of the study was to develop a methodology for managing the training of a sports reserve in Nordic combined with the use of an information and communication environment.

Results of the study and their discussion. The results of our previous studies [1] related to the informatization of the sports training of Nordic skiers have created favorable opportunities for developing a methodology for managing the training of a sports reserve in Nordic combined based on the information and communication environment (hereinafter

referred to as ICE), which is schematically shown in the figure.

The content of the methodology consisted of key blocks: conceptual, diagnostic, managerial influences and control. Let's consider each of them in more detail.

Concept block. The content of this block of methodology included the key methodological components of the study: purpose, objectives, scientific and methodological approaches, and organizational and methodological principles. In general,



Scheme of the methodology for managing the training of a sports reserve in Nordic combined based on the information and communication environment

the conceptual content of the methodology sets the direction for its implementation in the sports training of Nordic skiers.

Diagnostic block. The program of diagnostics and control is based on the scientific potential of the Tchaikovsky State Academy of Physical Culture and Sports laboratory, which has modern equipment for conducting systematic research in the field of genetics, bioimpedancemetry, sports biomechanics, tensodynamometry, ergometry, physiology and psychology, as well as summarizing the practical experience of pedagogical testing of athletes in Nordic Combined [2].

The section of the control program "Genetic predisposition" was implemented in two directions: the first one is connected with the determination of the athlete's potential to achieve high results in Nordic combined, the second one - with the identification of nutritional characteristics. The genetic predisposition to success in Nordic combined is carried out in the form of stage control only for those involved in the initial training stage. The study of predisposition to the assimilation of food products is also carried out in the form of staged control, however, this opportunity is provided to athletes of any age and qualification.

The control section "Morphology" is associated with the use of instrumental methods: the Antroscan morphological scanner and the InBody body composition analyzer. Determination of anthropometric indicators is carried out in the form of staged control for Nordic athletes of all stages of long-term sports training. However, the use of bioimpedancemetry is carried out differently depending on the stage of sports training.

The section "Physical fitness" includes two areas that evaluate the indicators of general and special physical fitness of Nordic skiers. To conduct a survey of athletes of a general physical orientation, pedagogical testing is used with an approved battery of control tests and an isokinetic dynamometer Biodex, which are carried out in the form of a staged control. At the same time, the isokinetic dynamometer is used only when examining athletes, starting from the training stage. When conducting surveys of a special physical orientation, pedagogical testing is carried out in the form of a staged control for athletes of all stages of sports training, and tenzodynamometry is implemented in the preparation of athletes at the final stages in the form of current and staged control.

The section "Technical preparedness" also includes two major areas related to the definition of jumping and cross-country skiing. Diagnostics of technical readiness is realized with the help of biomechanical analysis of athletes' movements during their performance of special or competitive exercises, which is carried out in the field in the form of current and staged control by means of a computer system for video analysis of movements, which allows studying the angular and spatio-temporal characteristics of athletes without age restrictions.

The section "Functional readiness" is also associated with the implementation of control in two tracks: the first one is focused on diagnosing the activity of the cardiorespiratory system of the body of athletes, the second one evaluates the work of the neuromuscular system. The assessment of the functioning of the cardiorespiratory system is carried out using the methods of ergometry and gas analysis in a staged form of control for athletes training at the training stage and older.

The section of the control program "Psychological readiness" is carried out by means of diagnostics of individual psychological properties of the personality in the form of staged control without age restrictions for athletes.

The section "Competitive activity" consists of two key areas that evaluate the jumping part of the competition and the skiing part. Both directions of this section are controlled using the competitive activity assessment method in the form of current and staged control for athletes at each stage of sports training.

Taking into account the requests of coaches and athletes in Nordic combined, the ICE software provided and implemented a whole section for managing the training of a sports reserve in Nordic combined based on entering information about the results of scientific examinations of athletes into the information database module, which consisted of special submodules that fully corresponded to the sections diagnostic and control programs, allowing to accumulate information about genetic predisposition, morphological features of the body structure, physical, technical, functional, psychological readiness and competitive activity, characterizing both sports disciplines of Nordic combined: ski jumping and cross-country skiing.

Block of managerial influences. The management of sports training is largely carried out through a

pre-drawn plan and a developed training program that takes into account age, gender, period of the annual cycle, the stage of sports training, as well as the timing and venue of the main, qualifying and control competitions [4, 5].

The results of diagnostics and control over the preparedness of Nordic skiers are one of the grounds for making changes to the plan of sports training proposed by the coach. Summarizing the practical experience of scientific and methodological support of Nordic athletes' sports training showed that after studying and analyzing the results of athletes' examinations, the coach can make the following managerial decisions: continue the implementation of the originally proposed plan and training program without making changes; carry out the correction of the proposed plan and training program; completely abandon the proposed plan and training program and develop new ones.

The control block was the final component of the experimental procedure. The content of this block was identical to the content of the diagnostic block, since the same means, methods, procedures and forms of control were used. The difference was that in the diagnostic block, the athletes performed the first examination to identify the current level of preparedness (in accordance with the developed plan), while the final examination of the combined athletes was carried out in order to control the effectiveness of the training plan proposed by the coach (taking into account changes) and belonged to the control block. After comparing the results of athletes at the beginning and end of pedagogical influences using ICE, the coach made a decision on the advisability of continuing the training process according to the plan being implemented.

Conclusion. The system of successive control and monitoring examinations of Nordic skiers' preparedness, developed by scientists and specialists of Tchaikovsky State Academy, created favorable conditions for the selection and sports selection of Nordic athletes from among the sports reserve in order to identify those involved who have really high potential and great inclinations to achieve sports success in Nordic Combined at every stage of many years of sports training.

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Forecasting the competitive performance of young athletes based on artificial intelligence technology

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Abstract

Objective of the study was to develop a program for predicting the competitive performance of young athletes based on artificial intelligence technology.

Methods and structure of the study. As part of the scientific work, the collection and processing of individual data of athletes (n=56) was carried out according to 38 characteristics, ranked into 2-4 categories in three key areas: heredity, environment and individual.

Results and conclusions. As a result of data processing using deep neural networks and machine learning algorithms, two categories of prediction were identified: athletes who achieved a sports title or the highest category, and athletes who did not reach this level. The control testing of the created program showed only 11% of the error probability in predicting the competitive performance of young athletes. The author's program made it possible to identify reliable patterns: if a young athlete's mother has a sports title, then with 79% probability he will be effective in future competitive activities, and if he is still trained by a mentor with experience from 16 to 30 years, then the probability of reaching the highest level or sports title rises to 86%.

Keywords: *young athletes, competitive performance, artificial intelligence, forecasting, intellectual program.*

Introduction. Today, information technologies are becoming more and more active and multifaceted part of the life of the younger generation, students and society as a whole [2]. Every year it is more and more difficult to imagine any of the spheres of human social activity without various achievements of scientific and technological progress in the field of digitalization [3]. The society has reached the stage of development at which programs, neural networks, various intelligent systems and digital technologies have the most significant impact on it [1]. The introduction of such technologies, including the most "top" of them, such as artificial intelligence programs, using machine learning, are beginning to make more and more important in the process of continuous modernization to improve the quality of human life [6].

One of the most progressive social spheres of a person, in which various intellectual technologies are actively used, is physical culture and sports activity [4]. In the last decade, various artificial intelligence systems with a continuous increase begin to have an increasingly significant impact on it [1]. In the field of physical culture and sports, these technologies are used to analyze large arrays of sports data, in terms of statistics on the actions of athletes and referees based on video recordings of a match or indicators of the physical activity of competitors [1, 4, 6]. Intelligent systems provide virtual sports assistance, assist in supporting the physical culture and sports potential of athletes, in the implementation of e-sports and sports betting activities [1, 5]. In the period of preparation for competitions, the coaching staff and the athletes themselves begin to actively use the results of intellectual

analysis to make the most rational decisions, and in some cases, artificial intelligence technologies make it possible to fully automate the training process [2, 4, 5].

Thus, the theoretical analysis of the existing possibilities of using artificial intelligence to improve the quality of physical culture and sports activities of the younger generation shows that today there is a special need and need for experimental research in this direction [1, 4].

Objective of the study was to develop a program for predicting the competitive performance of young athletes based on artificial intelligence technology.

Methods and structure of the study. At the preliminary stage of the study (May 2022), individual data of athletes (n=56) involved in various sports or who have already completed their sports careers were collected and processed. To collect information, an analysis of archival data of athletes from children's and youth sports schools in the cities of Chaikovsky (Perm Territory), Izhevsk and Glazov (Udmurt Republic) was carried out, as well as their personal and telephone surveys. For the study, data were collected from athletes during the time period when they were young

Table 1. *Classification of the data of young athletes on the grounds and their categories*

Signs: categories
Heredity
Gender: young man, girl
Zodiac sign by elements: fire, earth, air, water
The decade of the zodiac sign: 1-10, 11-19, 20-31
Maximum oxygen consumption: <25, 25-35, >35
Blood type: 1, 2, 3, 4
Hemoglobin: <115, 115-150, >150
Hematocrit: <35, 35-45, >45
Minerals (%): <7, 7-10, >10
Total amount of liquid (%): <40, 40-50, >50
Protein (%): <10, 10-15, >15
Muscle fibers are white/red: <b, b=k, <k
Vital capacity of the lungs: <1500, 1500-2000, >2000
Respiratory volume: <180, 180-250, >250
Environment
Age at the time of «enrollment» in the section: 7-8, 9-10, 11-12
The marital status of a young athlete: a complete family, an incomplete family, an orphan
Place of residence: city of more than 100 thousand, city of less than 100 thousand, village
Elder brother / sister: no or not involved in sports, has a rank, title
Father: no or not involved in sports, has a rank, has a title
Mother: no or not involved in sports, has a rank, has a title
Coach qualification: has a rank, Candidate Master of Sports / Master of Sports title, International Master of Sports / Honored Master of Sports title
The performance of the trainees of the coach over the past 5 years: categories, CMS title, MS/IMS title
Trainer experience: up to 5 years, from 6 to 15, from 16 to 30, from 31 and above
Father or mother work in the field of FC and sports: no, yes, part-time
Education: school, gymnasium, lyceum
Who enrolled in the section: himself/friend, grandmother/grandfather, brother/sister, father/mother
Individual
The presence of the All-Russian sign «Ready for work and defense»(GTO): no, there is
Average grade in school for the previous year: <4,2, 4,2-4,7, >4,7
Skipping classes for no good reason / all workouts(%): >10,3-10,<3
Skipping classes for a good reason / all workouts (%): >15, 5-15, <5
Physical Development according to GTO testing: unsigned, bronze / silver, gold
Average performance in the first two/three competitions: <3, 2-3, >2
Cooper's Strength Endurance Test (min): <1,2, 1,2-2, >2
Muscle mass index to height and weight: <15, 15-20, >20
Fat content (%): <25, 25-35, >35
Fat-free mass (%): <75, 75-65, >65
Muscle mass in relation to the lower to upper extremities:<1,2,1,2-1,5,>1,5
Muscle mass in relation to right and left: <1,05, 1,05-1,1, >1,1
Muscle mass in relation to the limbs to the body: <1,2, 1,3-1,5, >1,5

athletes and were just starting their sports career. The experimental sample included athletes who currently have the highest sports category "Candidate for Master of Sports of Russia" or the sports title "Master of Sports of Russia" (n=14), athletes of III-I sports categories (n=17) and athletes with youth sports ranks or no ranks (n=25).

At the main stage of the study (June 2022), a program was developed to predict the competitive performance of young athletes based on artificial intelligence technology using the Orange analytical system. In the interface of the Orange software, a workflow was created to analyze data using process intelligent models. To implement the experimental work, deep neural networks and machine learning algorithms for categorical classification were used: "Logistic regression" and "Random forest" [5]. In the process of analyzing big data, the predictive and classification functionality of the Orange intellectual platform was used. For the "training" of the author's program on the intellectual platform Orange, the data of not all athletes were used, but only those selected by random sampling (n=32) for training testing. An important condition for testing the program was the uniformity of the sample, namely, the tested sample should include both athletes of the highest category and titles, and those with sports categories or not having sports qualifications.

At the final stage of the study, a system analysis of the program for predicting the competitive performance of young athletes in the Orange intellectual system created at the previous stage made it possible to determine the main classification for predicting sports performance. The program was finally tested with a validation sample (n=15), which was also selected randomly, but with a mandatory condition for sample uniformity. With the help of the data of the validation set, the program already independently revealed the forecast based on machine learning, taking into account the classification of patterns [5]. When determining the error, additional "training" of the intellectual system was carried out until the program found the correct and optimal patterns for predicting the correct answer [4]. At the end of this stage, the program was tested by a control sample (n=9), which also included athletes with titles, categories and no qualifications. The data of the control sample entered into the program made it possible to identify the final percentage of the reliability of forecasting of the author's intellectual development.

Results of the study and their discussion. Based on a preliminary analysis of the special scientific literature and the features of the versatile monitoring of young athletes, a system of signs and their categories was compiled to implement the process of intellectual forecasting [1, 4, 6]. The system was classified according to 38 features, each of which was ranked into 2-4 categories, in three key areas: heredity, environment and individual (Table 1):

After defining the features of comparison by category, the individual data of the athletes participating in the experiment, obtained at a time when they were still young and novice athletes, were loaded into the Orange analytical system. It should be noted that not all indicators were collected for each athlete, since some of the indicators were lost over the years or were not previously included in the monitoring of the athlete, especially the analysis of body composition. As a result of data processing using deep neural networks and machine learning algorithms "Logistic Regression" and "Random Forest", two categories of prediction were identified: athletes with a sports title or the highest rank, and athletes who have not reached this level. After additional "training" of the intelligent system with the help of the validation sample, the pro-

Table 2. *The results of the reliability of the categories of features that significantly affect the prediction of the competitive performance of young athletes (%)*

Categories of features on the result «will be performed by a candidate for master of sports of Russia or the title of MS Russia»		1	1-2	1-3	1-4
1	Sports mother: has a sports title	79			
2	Trainer experience: 16 to 30		86		
3	Father or mother work in the field of FC and sports: part-time			93	
4	The performance of the trainees of the coach over the past 5 years: the title of Master of Sports (MS) / International Master of Sports (IMS)				100
Categories of signs according to the result «Candidate for Master of Sports of Russia or the title of MS of Russia will not fulfill the category»		1	1-2	1-3	1-4
1	Who «recorded» in the section: grandmother or grandfather	83			
2	Training of a young athlete: lyceum		88		
3	Skipping classes without a valid reason from all training sessions (%): >10			93	
4	Average grade in school for the previous year: <4.2				100

gram was verified by the data of the control sample. As a result, the program showed only one error out of nine, which corresponds to only 11% of the probability of an error created by the author's program based on artificial intelligence. The program showed the only error, only for a group of 6 athletes who did not reach the highest sports category and the title of candidate master or master of sports of Russia.

Thus, the program for predicting the competitive performance of young athletes based on artificial intelligence technologies was tested and finally developed. Nevertheless, when using the program in practice to improve the training process, data were needed on which features and categories had the greatest impact on performance or, conversely, on their insignificance for further success in competitive activity. In this regard, by changing the functionality of the intellectual program, categories of features were identified that most significantly affect the result of predicting the competitive performance of young athletes (Table 2)

After identifying the categories of features that most reliably affect the result of predicting the competitive effectiveness of young athletes by analyzing the data of the entire experimental sample (N = 56), the percentage ratio was obtained in various combinations of categories of features (Table 2). The effectiveness of forecasting in both categories is 100% recorded if the young athlete manifests itself in monitoring jointly 4 categories of features. If the young athlete is fixed in the 3rd category of features (1-3), then he will be performed in the future in the future in the future athletic, the highest category or title or, conversely, as shown in table 2, in 93% of the probability will not reach this level. In turn, if a young athlete has a sports title (1 sign with a category for execution), then with a 79% probability it will be effective in future competitive activities. And if, it will still be trained by a mentor with experience from 16 to 30 years old (1-2 signs), then the probability of achieving the highest sports category and the title of master of sports of Russia increases to 86%. On the other hand, if the athlete was "recorded" in the section Grandpa or grandfather (1 sign with a category for non -implementation), then he will not reach a high level in his career with 83 %. And if he still studies at the Lyceum (1-2 signs), then the probability of not reaching the sporting highest category and the title of Russia in him increases to 88%.

Conclusions**.** Thus, the study attempts to look into the future and create an intelligent big data technology that is fully consistent with the development of modern sports. The developed author's program based on artificial intelligence makes it possible to predict the competitive performance of a novice athlete and identifies key categories of features that positively or negatively affect the possibility of a novice athlete achieving the highest sports category or title in the future. The use of neural networks and machine learning algorithms, as shown by the results of the study, improves the quality of sports selection, which will allow timely individualization and improvement of the training process. In this direction, it is artificial intelligence technologies with a properly selected algorithm for clustering, classification and forecasting that have a strong and stable ability for intellectual analysis, choosing the main data that are significant for improving the effectiveness of a young athlete's sports trajectory.

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Scientific and methodological support of judoists training

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Abstract

Objective of the study was to identify effective means and methods for diagnosing physical qualities and functional state in the process of sports training of judo wrestlers.

Methods and structure of the study. The scientific experiment was carried out with the help of a theoretical analysis of scientific and methodological literature and generalization of the experience of the scientific and medical center of the Chaikovsky State Academy of Physical Culture and Sports.

Results and conclusions. As a result of the experiment, a program of scientific and methodological support for the training of judokas was developed, based on the diagnostic potential of the scientific laboratory of the Tchaikovsky State Academy of Physical Culture and Sports and including the following sections: morphology, physical, technical-tactical, functional and psychological readiness. The program of scientific and methodological support for the training of judoists is implemented at all stages of the long-term development of sportsmanship within the framework of ongoing, milestone comprehensive surveys, as well as surveys of competitive activity.

Keywords: *examination program, scientific and methodological support, judo, judoists.*

Introduction. Scientific and methodological support for the training of a sports reserve in the system of long-term sports training of judokas is necessary for better and more efficient work of a coach with athletes at all stages of sports training [4, 9, 12].

One of the most important aspects of an athlete's successful career is highly professional scientific, methodological and biomedical support at all stages of his training. At the present level of development of science, various means appear and become available to achieve results as quickly as possible [5, 6, 11].

In modern conditions, the effectiveness of scientific and methodological support for judo wrestlers can be significantly increased through the use of special equipment that allows for professional diagnostics of permissible loads, as well as assessing the condition of athletes during the training process [1, 3, 8].

Scientific and methodological support for the training of athletes at the stage of initial training contributes to the harmonious physical development of beginner athletes and the formation of the foundations of the correct technique of competitive exercises in them. At the training stage - the purposeful development of physical qualities and the improvement of technical training with overcoming various confusing factors. At the stage of improving sportsmanship and higher sportsmanship - an accentuated development of special physical qualities and functional systems of the body, an in-depth improvement of technical and tactical skills, the formation of tactics [2, 7, 10, 13].

Objective of the study was to identify effective means and methods for diagnosing physical qualities and functional state in the process of sports training of judo wrestlers.

Methods and structure of the study. The scientific experiment was carried out with the help of a theoretical analysis of scientific and methodological literature, scientific articles in journals, collections of scientific and practical conferences, monographs and dissertations on the research topic were studied. The experience of the scientific and medical center on the basis of the Federal Training Center "Snezhinka" of the Tchaikovsky State Physical Education and Sport Academy (TchSPhESA) is summarized.

The program of examinations within the framework of scientific and methodological support for the training of judokas

Focus of the survey	Means and methods of survey	Characteristics of the survey
Technical and tactical readiness	Control tests, pedagogical observation and video analysis	Determination of indicators in training and competitive bouts: «Activity», «Efficiency», «Reliability of attacking actions», «Reliability of defense», «Combination», «General variability» and «Effective variability»
	Hardware-software complex Qualysis	Allows you to evaluate the technique of performing movements based on the creation of a three-dimensional model of a moving human body with a mathematical analysis of the main aspects of movement. Allows not only to visualize the smallest details of the exercise, but also to present their spatial and temporal characteristics
General and special physical fitness	Control tests, pedagogical testing	Complex modified test: 1) 10 twists on a throw over the back with a one-sided grip without breaking off the partner (estimates mainly special speed abilities), 2) 5 twists on the throw «through the chest» with a breakaway of the partner (estimates mainly special strength abilities), 10 runs on the wrestling bridge (5 in one direction and 3) 5 in the other direction) (predominantly assesses special coordination abilities), 4) 5 crown throws with a painful hold on the arm (performed in «triples») (it evaluates mainly special coordination abilities). 5) The total time of the complex test (seconds) is an integral indicator that evaluates the manifestation of the special physical qualities of judo wrestlers: endurance, speed, strength and coordination
	Blazepod signal lights, pedagogical testing	Includes 4 modules for creating tasks and tests that allow you to evaluate the speed of reaction. Also used by judokas to train reaction speed
	Biodex software package, isokinetics	Biodex allows you to evaluate the maximum strength of the muscles of the arms and legs of athletes. Also used in the development of various joints and strengthening of various muscle groups. With the help of various nozzles, the lost motor function in various joints is restored.
	Hardware and software complex «Stabilan-01», stabilometry	Allows you to evaluate the ability to coordinate movements. Can be used to develop coordination and correct coordination disorders
Functional readiness	Hardware-software complex «Simona 111»	It is used to measure various physiological indicators of central and peripheral hemodynamics, respiratory function, body temperature, brain activity and metabolism
	Hardware and software complex «Omega-S»	Allows you to track the quality of recovery processes occurring in the body, which allows you to ensure a balance between high loads and maintaining health, predict the achievement of the peak of sports form and maintain it throughout the entire competitive period
	Polar H10 chest heart rate monitor, pulsometry	Allows you to track the heart rate of an athlete, which is displayed on the screen of a phone or tablet using Polar programs. Thanks to this, it is possible to control the parameters of the used means and methods of training in five zones of intensity. The program records training time in each intensity zone, total training time, average and maximum heart rate, calories burned and the percentage of fat in calories burned.
	Bicycle ergometer Monark 828E, ergometry (PWC170, Wingate test)	Helps determine maximum oxygen uptake and anaerobic performance of judokas. It is intended for an indirect assessment of general performance as a physiological basis for general physical fitness and an integral assessment of the state of the respiratory and cardiovascular systems.
	MetaLyzer gas analyzer, gas analysis (maximum step load test)	A system for cardio-respiratory exercise diagnostics that determines oxygen consumption and anaerobic metabolism threshold. This device allows you to directly study the three components of this quality: maximum oxygen consumption, maximum oxygen consumption retention time and anaerobic exchange threshold
Psychological preparedness	KOMPAS and SAN methods, Eysenck Personality Inventory (MPI), «Neurosoft» hardware and software system, psychological testing	Allows you to get the following indicators: coping with unpleasant thoughts and emotions, activation and relaxation skills, involvement and «flow», visualization, self-efficacy, planning, activity under stress, relationship with the trainer (points); well-being, activity, mood (points); assessment of the state of motivation; restlessness, excitability, anxiety and self-doubt (points)
Morphology	Morphological scanner Antroscan, anthropometry	Allows you to carry out a three-dimensional measurement of human body parts in a matter of seconds. Used to study physical development, anatomical features, control changes in the structure of the human body under the influence of physical exercises
	Body Composition Analyzer InBody720, bioimpedancemetry	Determines the dimensional characteristics and composition of the body: the percentage of fat and muscle tissue, fluid in the body. The device allows you to measure the amount contained in the human body: protein, fat, minerals and water, both in general and in individual parts of the body. It is an indispensable tool in monitoring the process of weight correction and dieting and evaluating their effectiveness.

Results of the study and their discussion. In order to meet the needs of athletes and coaches in various sports in the scientific and methodological support of their sports training, active work is being carried out on the basis of scientific and medical centers. In this regard, a number of studies of judo wrestlers of various qualifications were carried out at TchSPhESA, which made it possible to identify the most informative and effective methods of scientific and methodological support for judo wrestlers at all stages of many years of training [1].

Particular attention should be paid to the impact of sports loads on the body. Specialists of the scientific and medical center conduct an expert assessment of the possibilities of going in for sports and physical culture, rehabilitation treatment of athletes with overtraining phenomena.

For a comprehensive analysis of the physical form, assessment of the state of the cardiovascular system and the body's tolerance to physical exertion, functional tests with various types of loads are carried out on the basis of the Scientific and Medical Center. Assessment of the special physical fitness of judo wrestlers is carried out with the help of special tests, including with the help of special training devices and computer programs.

Based on the analysis of scientific and methodological literature and practical experience in conducting examinations of judo wrestlers at the scientific and medical center of the Tchaikovsky State Physical Education and Sport Academy, we developed a program of examinations as part of the scientific and methodological support for the training of judo wrestlers (see table).

It should be noted that this program should be implemented within the framework of current and stage complex surveys, as well as surveys of the competitive activity of judokas.

Conclusions. Thus, the results of the research of the TchSPhESA scientists made it possible to develop an updated program of examinations as part of the scientific and methodological support for the training of judokas. Means, methods, techniques and diagnostic stands that are part of the examination program, allow you to get comprehensive information about the motor potential, different types of preparedness and aspects of sportsmanship of judokas. Based on the results of the examination program, athletes and coaches receive reports and personal recommendations for timely correction of the training program, which makes it possible to balance various types of loads within the training cycle, rationally distribute the functional resources of the body and achieve maximum efficiency, while avoiding the risk of overstrain or insufficient recovery.

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Assessment of proprioceptive sensitivity of young ski jumpers

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Abstract

Objective of the study was to evaluate the proprioceptive sensitivity of young ski jumpers.

Methods and structure of the study. The study involved young ski jumpers aged 9 to 11 from Belarus, Slovakia and Russia. The sample consisted of 50 subjects, of which 19 were girls and 31 were boys. The main research methods were the method of pedagogical observation and the method of strain measurement.

Results and conclusions. In the course of pedagogical observation, it was found that the most common mistakes in taking the acceleration stance are caused by uneven distribution of body weight, leading to critical changes in the general center of mass of athletes. Minimization of the asymmetry index when performing a vertical jump on a tensometric platform is one of the indicators of the quality of the functioning of the "posture-voluntary movements" system, as well as proprioceptive sensitivity in young ski jumpers.

Keywords: *ski jumping, tensometry, proprioceptive sensitivity*

Introduction. In ski jumping, the ability to adequately assess the position of the body and its links in space and differentiate efforts becomes decisive for achieving a high sports and technical result. First of all, this is due to the fact that the athlete who is able to measure his actions and control them in constantly changing environmental conditions while maintaining his own balance and correct posture will be able to perform the jump most effectively [1, 3].

The leading contribution to ensuring balance is made by the proprioceptive sensory system, which provides information about the positions and movement of parts and the whole body in space [2, 4].

Proprioception in Russian scientific literature is commonly understood as "... the ability to control and evaluate the relative position and movement of various parts of the body in space, as well as the differentiation of muscle efforts during the performance of motor acts" [2].

In foreign sources, it is interpreted somewhat more broadly: as "... a concept that includes balance and postural control with visual and vestibular input, joint kinesthesia, position sense and muscle reaction time" [5, 6].

Any exercises and special technical means that increase proprioceptive sensitivity will be very useful for ski jumpers, as they contribute to the formation of optimal body control programs during the performance of a competitive action - ski jumping [1, 3].

However, our analysis of the scientific and methodological literature did not reveal special studies on the assessment and development of the proprioceptive sensitivity of young ski jumpers.

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Methods and structure of the study. The study involved young ski jumpers aged 9 to 11 from Belarus, Slovakia and Russia. The sample consisted of 50 subjects, of which 19 were girls and 31 were boys. The main research methods were the method of pedagogical observation and the method of strain measurement.

At the first stage of the study, an expert assessment was carried out of the acceptance and retention of the acceleration stance by young ski jumpers.

Each subject was asked to take an acceleration stance and try to maintain it for 10 s. Each subject had

3 attempts, the interval between which was 5 minutes, which was due to the need for his recovery. In the process of pedagogical observation, the experts recorded the errors that occur in young ski jumpers and the frequency of their occurrence.

Results of the study and their discussion. In table 1 presents the results of pedagogical observation. As a result of pedagogical observation, it was found that in the overwhelming majority of cases in young ski jumpers, errors occur due to uneven distribution of body weight, which subsequently leads to changes in the projection of the general center of mass of athletes, causing most other errors according to the "domino" principle.

In order to confirm the data of pedagogical observation, a study was conducted of the subjects on a stationary double strain gauge platform COBS (Germany), equipped with a computer with appropriate software. Each subject was asked, while on the tension platform, to jump up from a place from the main stance and, after resting, jump up from the acceleration stance. Each subject had 3 attempts, the interval between which was 5 minutes, which was due to the need for his recovery.

The use of the strain platform was aimed at obtaining the following data: the height of the jump and its relative power, the strength index and the asymmetry index. The latter was calculated as the ratio of the impulses of the pressure forces exerted by the lower limbs on the plane of the tension platform according to the formula proposed by the specialists of the Tchaikovsky State Physical Education and Sport Academy, and was a quantitative characteristic of motor asymmetry during repulsion [1].

With an absolutely symmetrical repulsion, the asymmetry index is equal to zero; when performing a jump on one limb, the index is 100% [1].

The results of the study on the strain platform are presented in Table 2.

The statistical analysis made it possible to state that the jump height indicators of young ski jumpers from the main stand of all three countries statistically exceed the jump height indicators from the acceleration stand ($p<0.05$), while there are statistically sig-

Table 1. *The results of pedagogical observation of the technique of performance by young ski jumpers of holding the acceleration stance*

Subject of observation	Technical requirements	Error rate, %
Body weight distribution	Evenly on both legs	80
Projection of the total center of mass of the body	Passes through the middle of the foot	70
Torso	Almost parallel to the floor, the shoulders are free, the stomach is slightly pressed against the hip	70
Knees, thighs and shins	Parallel to each other, shoulder width apart	60
Hands	Symmetrically stretched back along the trunk, slightly pressed at the height of the hip joint and freely located parallel to the upper body	50
Back, head	Straight, parallel to the floor, the head «continues» the back («long» back), neck and shoulders are free	40
Shoulder axis	Parallel to the floor	40

Table 2. *Tensometry results of young ski jumpers*

Indicators	Gender	Values of tensometric indicators,					
		Russian Federation		Belarus		Slovakia	
		From the acceleration rack	From the main rack	From the acceleration rack	From the main rack	From the acceleration rack	From the main rack
Vertical jump height, m	b	0,24±0,05	0,34±0,07	0,28±0,02	0,37±0,06	0,27±0,01	0,33±0,01
	g	0,24±0,06	0,32±0,08	0,28±0,03	0,4±0,08	0,25±0,00	0,26±0,05
Strength index	b	1,91±0,13	2,5±0,52	2,15±0,17	2,84±0,11	2,22±0,24	2,62±0,011
	g	1,91±0,14	2,5±0,34	2,1±0,16	2,65±0,13	2,05±0,11	2,6±0,07
Relative jump power, W/kg	b	6,44±2,1	10,47±3,17	8,7±1,7	14,0±3,01	7,6±0,6	11,0±0,034
	g	6,22±1,55	9,84±2,46	8,5±1,42	13,3±3,08	7,1±0,5	9,0±1,21
Asymmetry index, %	b	13,45±6,95	14,93±6,4	10,2±3,13	8,34±6,09	8,56±4,77	13,04±1,39
	g	15,31±7,96	16,9±6,43	9,36±3,16	7,83±3,05	9,77±2,75	12,81±2,03

nificant differences in the jump height indicators from the main stand. there were no stand-ups between athletes from different countries both among boys and girls (p>0.05). As for the jump from the acceleration stance, among boys, the best results were among young athletes from Belarus and Slovakia, and among girls, only girls from Belarus (p<0.05).

When studying the differences in jump values in three attempts (as an expected indicator of the proprioceptive sensitivity of young ski jumpers), the coefficients of variation in the samples of both boys and girls from all three countries fell within the range from 0.23 to 0.25, which indicates a sufficient homogeneity of the results. demonstrated by the subjects.

As for the "Power Index" indicator, the statistical analysis made it possible to state that in young ski jumpers of all three countries from the main stance it statistically exceeds that when jumping from the acceleration stance (p<0.05), while statistically significant there were no differences in the strength index from the main stance between athletes from different countries, both among boys and girls (p>0.05). Among the boys, the higher values of the "Index of Strength" indicator, recorded in the jump from the acceleration stand, turned out to be among young athletes from Belarus and Slovakia (p<0.05), and among girls there were no statistically significant differences in its values (p>0, 05). When studying the differences in the "Power Index" indicator in three attempts (as an estimated indicator of the proprioceptive sensitivity of young ski jumpers), the coefficients of variation in the samples of both boys and girls from all three countries fell within the range from 0.07 (when jumping from the main stance) to 0.13 (when jumping from the acceleration rack), which indicates the absolute homogeneity of the results demonstrated by the subjects in this indicator.

An approximately similar picture was obtained when analyzing such an indicator as "Relative jump power". Similarly, the indicators of the relative jump power of young ski jumpers from the main stance of all three countries statistically exceed the relative power of the jump from the acceleration stance (p<0.05), however, according to this indicator, statistically significant differences were recorded between athletes from different countries with performing a jump from the main stance: higher values were recorded in boys and girls from Belarus (p<0.05).

As for the jump from the acceleration stand, there were no statistically significant differences in the "Relative power of the jump" among the boys (p>0.05), and among the girls, the representatives of Belarus again turned out to be better (p<0.05). When studying the differences in the indicator "Relative jump power" in three attempts (as an estimated indicator of the proprioceptive sensitivity of young ski jumpers), the coefficients of variation in the samples of both boys and girls from all three countries fell within the range from 0.23 to 0.25, which indicates sufficient homogeneity of the results demonstrated by the subjects in this indicator.

The conducted statistical analysis made it possible to state that the indicators of the "Asymmetry Index" in young ski jumpers of all three countries when performing two jumps do not statistically differ (p> 0.05), however, statistically significant differences were recorded in this indicator between athletes from different countries when performing a jump from the main stance: higher values were recorded in boys and girls from Belarus (p<0.05). As for the jump from the acceleration stand, among boys, the best results were among young athletes from Slovakia, and among girls, among representatives of Slovakia and Belarus (p<0.05). It should be noted that when studying the differences in the "Asymmetry Index" in three attempts (as an expected indicator of the proprioceptive sensitivity of young ski jumpers), the highest values of the coefficients of variation in the samples were obtained: the range was from 0.38 (when jumping from the main stance) to 0.52 (when jumping from an acceleration rack), which indicates a high heterogeneity of the results demonstrated by the subjects in this indicator, and therefore it (when striving for a minimum) becomes the most informative when studying proprioceptive sensitivity in young ski jumpers.

Conclusions. The most common mistakes in taking the acceleration stance are caused by uneven distribution of body weight, leading to critical changes in the general center of mass of athletes. Minimization of the asymmetry index when performing a vertical jump on a tensometric platform is one of the indicators of the quality of the functioning of the "posture - voluntary movements" system, as well as proprioceptive sensitivity in young ski jumpers.

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Psycho-physical state as the basis for the manifestation of special physical fitness of young ski racers

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Abstract

Objective of the study was to substantiate the concept of "psychophysical state" and to reveal its connection with the special physical fitness of young ski racers.

Methods and structure of the study. The conducted scientific work is based on the method of theoretical analysis and generalization of scientific and methodological literature.

Results and conclusions. In the course of theoretical analysis, the concepts of "psychophysical qualities" and "psychophysical state" are revealed. The significance of the physical and mental readiness of ski racers during the transition from the stage of initial training to the stage of sports specialization has been revealed. The requirements for the special physical fitness of young athletes at the stage of initial specialization are determined. The main features of this stage include the emergence of control measures, including standards for special physical training in the form of ski racing in classic and free style, as well as an increase in the number of control and main starts. At the same time, high demands are made on the technique of skiing.

Keywords: *young ski racers, psychophysical qualities, psychophysical state, normative requirements, special physical fitness.*

Introduction. In the training process of young cross-country skiers, physical training plays an important role, since it is aimed at developing all the physical qualities necessary for a skier's sports activities. Physical training is the basis for the development of physical qualities and increasing the functionality of the body of a young athlete in cross-country skiing.

Young cross-country skiers include athletes undergoing staged long-term training with a gradual increase in sportsmanship, which includes: preliminary training corresponding to the initial training stage at 9-11 years old, the initial specialization stage, divided into initial (first two years) and advanced specialization (3 to 5 years).

When moving from the stage of initial training to the stage of sports specialization, young ski racers for the first time pass the control and conversion standards for special physical training in the form of races with a classic and free style of movement [10].

In accordance with the federal standard of sports training for the sport of "cross-country skiing", at the stage of sports specialization, the number of control competitions is doubled compared to the stage of initial training (from three starts to six), and the number of main competitions is tripled (from two up to six) [10]. Competitive activity requires the ability of young athletes to tune in at the start of the competitive distance and work it out to the finish line. At the same time, N.N. Melentieva and R.V. Puzyrevsky show that children are not always psychologically ready for them [6, 11]. There is a contradiction between the need for a sufficient level of special physical fitness, which ensures the passing of control and conversion standards, and insuf-

ficient psychophysical readiness of young ski racers for the first competitive starts.

Objective of the study was to theoretically substantiate the definition of the concept of "psychophysical state" and to reveal its connection with the special physical fitness of young cross-country skiers.

Methods and structure of the study. The conducted scientific work is based on the method of theoretical analysis and generalization of scientific and methodological literature. The theoretical basis of the study was the works of M.A. Kolpinskaya, S.V. Makeeva, G.I. Mokeeva, A.V. Adchenko, N.N. Melentieva.

Results of the study and their discussion. During the analysis of scientific and methodological literature, it was revealed that physical training is a basic component in the training process of young cross-country skiers. A sufficient level of preparedness allows you to cope with increasing physical exertion and master the technique of skiing.

According to N.G. Ozolin, one of the reasons for improper technique is a low level of physical fitness. It is more difficult to correct a technique than to re-teach it, so it is important to pay attention to physical training with young athletes. With a low level of physical fitness, it will be difficult to cope with the requirements for the technique of skiing [8].

The level of development of one or another physical quality of a skier is determined by the specificity of cross-country skiing. Therefore, all physical qualities and abilities can be divided into basic and additional. The main ones include general and speed-strength endurance, while the additional ones include strength, speed, flexibility, general and special coordination, dexterity, balance [3].

Often, when considering physical qualities, they imply a complex set of physiological and mental properties of an organism, which determines the kinematic, dynamic and energy characteristics of a person's movement and call them psychophysical qualities [13].

Kinematic characteristics are associated with the manifestation of space-time indicators and reflect the degree of manifestation of such physical qualities as dexterity, speed and endurance.

Dynamic characteristics are closely related to such a physical quality as strength and are manifested in maximum, explosive, starting strength, strength endurance and speed-strength abilities [9].

The energy characteristics of the movement of the human body are manifested in the physical qualities of endurance and strength and reflect the work of the functional systems of the human body.

All characteristics of movement are closely related to the manifestation of a person's motor abilities, which largely depend on his innate anatomical, physiological, biochemical and mental characteristics. When the psychophysical qualities of an athlete change, the psychophysical state also changes, which manifests itself in a holistic reaction of the body to external and internal influences that occur when performing activities that are significant for a person and aimed at achieving a useful result.

Optimal psychophysical state provides an opportunity for an athlete: to maintain a positive emotional state in difficult conditions of training and competition; maintain a high level of physical performance; show intellectual, strong-willed qualities necessary in the race, despite the influence of factors that cause negative emotions, mental tension.

In the literature, the psychophysical state is considered as the preservation and development of its mental processes, morphological and physiological characteristics and their corresponding performance, providing adequate behavior in the circumstances and is accompanied by mental comfort with a maximum life expectancy [5].

The psychophysical qualities necessary for a skier-racer include: moral and psychological qualities - personal (temperament, character traits, motives, etc.); cognitive (memory, attention, thinking, perception); moral (moral values, attitudes towards people, readiness for self-improvement, etc.); socio-psychological (ability for positive interpersonal interaction, tolerance, non-conflict) [12].

The team of authors S.A. Kolpinskaya, M.A. Mikhalchenko et al., conducting research on university students, revealed a direct and strong connection between the physical and mental state and a high correlation between the psychophysical state and human activity. Based on the results of scientific analysis, they substantiated the existence of such a concept as a psychophysical state, including two components in it: mental (mental characteristics of the individual) and physical (physical health and development, functional and motor capabilities) [4].

Under the physical condition understand the readiness of a person to perform physical work, physical education and sports. The physical state is determined not only by any one indicator, but by a combination of interrelated features, and primarily such

as physical development, physical performance, functional state of organs and systems, gender, age, physical fitness [2].

High physical and psychological readiness of cross-country skiers is not only a guarantee of a successful result in competitions, but also a prerequisite for long-term professional activity. In the process of physical training, the necessary level of development of physical qualities is achieved, which ensures the ability to maintain a high pace of competitive struggle. While the psychological one allows you to form motivational attitudes and a willingness to realize your potential at the starts. Physical and psychological readiness is necessary for a ski racer for a successful start, the correct distribution of forces over the distance and finishing [11].

Conclusions. The psychophysical state is the basis for the manifestation of special physical fitness of young cross-country skiers. From this position in sports training, the concept of "psycho-physical state" is considered by the authors of the article as an integral complex of relatively stable values of kinematic, dynamic and energy characteristics of a person's movement, manifested in the aggregate of physiological, biochemical and mental processes occurring in a certain period of time in the body associated with physical performance. , character traits and personality traits of an athlete, reflecting the mechanisms of action of increasing specific physical loads and determining the effectiveness of achieving sports results in relation to the requirements of the chosen sport.

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Model characteristics of morphological indicators of the body composition of ski jumpers and nordic combined skiers

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Abstract

Objective of the study was to determine the model characteristics of the morphological indicators of the body structure of ski jumpers and nordic combined skiers.

Methods and structure of the study. The scientific work involved 13 ski jumpers, including 7 women and 6 men, 15 nordic combined skiers, including 9 women and 6 men. The bioimpedance method implemented in the professional analyzer InBody 720 was used to identify the morphological features of the body structure and analyze the body composition of highly skilled ski jumpers and Nordic skiers.

Results and conclusions. Analysis of the results showed that the model characteristics of the morphological parameters of the body composition of Nordic skiers differ from ski jumpers. So, ski jumpers are 2 cm higher than the Nordic skiers. The weight of Nordic skiers is 2.5 kg more than that of ski jumpers. In women, according to these indicators, the results are approximately the same. A significant difference was revealed in the indicator of women's muscle mass: biathletes had 2.45 kg more than ski jumpers. A comparative analysis made it possible to determine the deviations of each indicator of body composition from the model one and to focus further work on solving the identified problem.

The results obtained create the necessary conditions for individual training and implementation of a differentiated approach to improving the sports skills of ski jumpers and nordic combined skiers.

Keywords: *model characteristics, morphological indicators, ski jumping, nordic combined.*

Introduction. In elite sport, the use of model characteristics allows timely and objective assessment of the athlete's condition and making corrective changes to the sports training plan due to the targeted implementation of the principle of an individual approach that takes into account the specifics of sports activity to the maximum [3, 4]. According to many authors (V.V. Zebzeev (ski jumping); G.V. Barchukova (table tennis); A.Yu. Dyachenko, A.S. Fedotov (rowing); V.G. Lunichkin, S.V. Chernyshev (basketball), the model characteristics of athletes have a great influence on sports results; on the dominance of certain physical qualities in the body; on the speed of recovery; on the response of the body to physical activity; on the manifestation of the physical qualities of an athlete under load [1, 2, 6, 7].

When determining the model characteristics of athletes, it is important to take into account the morphological features of the body structure, which allows us to approach the issues of sports selection and individualization of the training process in a differentiated way. Currently, to assess the effect of systematic training on the body composition of athletes, professional body composition analyzers based on the method of multifrequency analysis of bioelectrical resistance (bioimpedancemetry) are widely used [4, 5].

Objective of the study was to determine the model characteristics of the morphological indicators of the body structure of ski jumpers and nordic combined skiers.

Methods and structure of the study. The scientific study was carried out on the basis of the federal center for training in winter sports "Snezhinka" named after A.A. Danilova FSBEI HE «Tchaikovsky State Physical Education and Sport Academy». The reference parameters were taken as the morphological indica-

tors of the body composition of the winners and prize-winners of the All-Russian competitions (Russian Ski Jumping Championship, Russian Cup Final in Ski Jumping, Russian Championship in Nordic Combined, Russian Championship in Nordic Combined). A total of 13 ski jumpers were examined, including 7 women and 6 men, 15 Nordic skiers, including 9 women and 6 men.

The bioimpedance method implemented in the professional analyzer InBody 720 was used to identify the morphological features of the body structure and analyze the body composition of highly skilled ski jumpers and Nordic skiers.

The following indicators of body composition of athletes were studied: height (cm), weight (kg), muscle mass (kg), fat mass (kg), minerals (kg), proteins (kg), extracellular fluid (l), body mass index (kg/m2), muscle mass of the right arm (kg), fat mass of the right arm (kg), muscle mass of the trunk (kg), fat mass of the trunk (kg), muscle mass of the left arm (kg), fat mass of the left arm (kg) , muscle mass of the right leg (kg), fat mass of the right leg (kg), muscle mass of the left leg (kg), fat mass of the left leg (kg).

The data obtained were subjected to statistical processing and determined using the method of sigmal deviations from the arithmetic mean of the sample.

Results of the study and their discussion. As a result of the study, model characteristics of the morphological indicators of the body composition of ski jumpers and Nordic skiers were determined (see table).

Analysis of the results showed that the model characteristics of the morphological parameters of the body composition of Nordic skiers differ from ski jumpers. So, ski jumpers are 2 cm higher than the Nordics. The weight of Nordic skiers is 2.5 kg more than that of ski jumpers. In women, according to these indicators, the results are approximately the same. A significant difference was revealed in the indicator of women's muscle mass: biathletes had 2.45 kg more than ski jumpers. Interestingly, in both men and women, the muscle mass index of the legs (both right and left) in ski jumpers is higher than in Nordic skiers.

Conclusions**.** Thus, the development of model characteristics of morphological indicators of body composition is an important point of analytical work. After determining the model characteristics, it became possible to compare the actual body structure indicators of ski jumpers and Nordic skiers with their reference parameters. This will allow determining the deviations of each indicator of body composition from the model and focusing further work on solving the identified problem.

Model characteristics of morphological indicators of the body composition of winners and prize -winners of all -Russian competitions

Indicators	Nordic combined	Ski jumping	Nordic combined	Ski jumping
	Men		Women	
Growth, see	176 ±1,5	178 ±1	169±1.5	168,5± 1,5
Weight, kg	66,5 ±1,5	63±1	56,75± 1,05	56,5± 1,05
Muscle mass, kg	35,35±1,15	34,7±1,1	29,3± 0,8	26,85±1,05
Fat mass, kg	5,0±0,2	4,55±0.25	9,5± 0,6	8,5± 0,4
Minerals, kg	4,2±0,1	3,95±0,15	3,235±0,225	3,32± 0,24
Proteins, kg	12,5±0,4	11,75±0,45	9,35± 0,35	9,5±0,8
Extracellular fluid, l	45,65±1,45	42,05±1,5	35,0± 0,1	33,4± 0,6
BMI (kg/m^2)	19±0,6	21,5±0,5	20,5±0,4	19,3± 0,4
Muscle mass of the right arm, kg	3,07±0,18	3,84±0,28	2,255± 0,075	2,4± 0,26
Fat mass of the right arm, kg	0,15±0,05	0,2±0,1	0,6±0,1	0,5±0,2
Muscle mass of the left arm, kg	2,975±0,155	3,9±0,29	2,25±0,09	2,335±0,235
Fat mass of the left arm, %	0,15±0,05	0,25±0,15	0,65±0,05	0,5±0,2
Muscular mass of the body, kg	25±0,9	28±1,1	21,2±0,9	20,05±0,85
Body fat mass, kg	2,25±0,35	1,65±0,35	4,95±0,35	3,75±0,3
Muscle mass of the right leg, %	9,83±0,51	10,24±0,26	7,225±0,375	7,73±0,37
Fat mass of the right leg %	0,95±0,15	1,15±0,15	1,8±0,1	1,55±0,25
Muscle mass of the left leg, %	9,785±0,665	10,05±0,24	7,07±0,37	7,85±0,29
Fat mass of the left leg, %	0,95±0,15	1,05±0.15	1,85±0,05	1,3±0,2

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Assessment of the functional preparedness of the women's national team of Russia in Thai boxing

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Abstract

Objective of the study was to assess the functional readiness of the Russian women's national team in Thai boxing.

Methods and structure of the study. The experiment took place from 03/12/2022 to 03/26/2022 at the Federal Sports Center "Yug Sport" in Kislovodsk. The 1st and 2nd numbers of the women's national team of Russia in the amount of 21 people took part in the training event. Correlation analysis of the means used: in the form of test training, current examination, no-load testing, was compared with an expert assessment of the leading specialists of the Russian national team.

Results and conclusions. A strong association with expert opinion was found with anaerobic hand performance recorded on the Monark Ergomedic 894E bicycle ergometer. Medium Connectivity is an exercise with BlazePod sensors in focus mode. Low connection in exercises: barbell, pull-ups on the horizontal bar, % fat, % muscle and the sum of the rating points. The rest of the tests were unreliable. The training process, with the inclusion of test tasks, motivate athletes to perform the load with dedication, and the proposed control over preparedness in the form of a set of rating points allows you to visually assess the profile of an athlete's preparedness, identifying his strengths and weaknesses. However, the selection of informative exercises for the preparation of highly qualified Thai boxers requires additional research.

Keywords: *functional state, heart rate variability, Polar-Team software, HYKSO trackers, BlazePod sensor, fitness profile, step load, body composition.*

Introduction. Preparation is a derivative of the preparedness of an athlete. The quality of preparedness directly depends on preparation. Control over the quality of preparedness will depend on the selected tests evaluating it [1, 2, 3, 4, 7].

The selection of the most informative tests related to the preparedness of highly qualified Thai boxers is still on the way. In this article, we discuss the legitimacy of using certain exercises in the preparation of the women's team in Thai boxing [5, 6, 7].

Objective of the study was to assess the functional readiness of the Russian women's national team in Thai boxing.

Methods and structure of the study. The training camp was held from 03/12/2022 to 03/26/2022 at the Federal Sports Center "Yug Sport", Kislovodsk. The 1st and 2nd numbers of the Russian women's national team in the amount of 21 people took part in the training event. This event was planned as a preparation for the World Championship, but due to sanctions against the Russian Federation, the pre-competition training camp was used in a test mode, where athletes could show their qualities without looking back at the upcoming start.

Before the start of the training camp, a group of experts (head coach of the Russian national team V.Yu. Ilyin, head coach of the women's team V.Ya. Manchur and assistant to the head coach of the women's team Yu.V. Dyurd) conducted an expert survey to identify the most promising athletes of the national team Russian

team participating in this event. Consistency of experts' opinions with a concordance coefficient of 0.71 indicates a high consistency of experts. The composition of the women's national team of Russia was represented by women aged 23 ± 5 years, from 15 cities of Russia, among them Honored Master of Sports - 1, Master of Sports of Russia of international class - 4, Master of Sports - 14 MS, Candidate Master of Sports - 2.

To assess functional fitness, daily unloaded testing of heart rate variability (HRV) was carried out, tests on General physical fitness and Special physical training took place as part of the training process, as well as laboratory testing at the Innovation Center of the Russian Olympic Committee. All the data received were summarized in one general table, taking into account the rating. Based on this rating, an individual profile of the athlete was built.

No-load testing was performed every morning before exercise using the diagnostic equipment of NPO «Dynamics» and the Omega-C program using the heart rate variability (HRV) method. To assess the functional state, indicators were used: IN (index of tension of regulatory systems of the body), IARS (indicator of activity of regulatory systems), TP (power of the wave spectrum). The range of heart rate variability during the training session was as follows: IARS (20.8-166.7), IN (25.1-287), TP (398-9036).

At the beginning and end of the training camp, Thai-boxers underwent a body composition examination by the bioimpedance method using the InBody 720 body composition analyzer. The first place in the rating was occupied by an athlete with a large % of muscle mass (37.2-48.2), a lower % of fat (13.4-37.2), and received the largest increase in these indicators at the end of the collection. At the end of the training camp, an increase in muscle mass was recorded in 9 athletes of the women's team, 1 athlete remained with the same indicators, and 11 Thai boxers had a decrease in muscle mass. The percentage of fat was reduced in 10 athletes, and 11 women received an increase in this indicator. In our opinion, this was due to the lack of competition at the end of the training event.

4 exercises were used to assess special physical training. Coordination properties and decision speed were evaluated using BlazePod sensors in two modes of operation. In the first mode (30 s) "focus", it was necessary to touch only the red sensor from 6 simultaneously lit up different colors, evenly fixed on the box-

Readiness rating of the Russian women's national Thai boxing team

place	Full Name	Hykso	BlazePod 1	neck 20 kg	barbell 50% weight	pull-up	press	diving under water	swimming 40 min	fat %	muscle %	static dynamics	TP	expert review	coordination	BlazePod 2	rowing simulator	MAP legs	MAP hands	jumping	aerobic fitness	Sum
1	B Va	13	8	15	18	17	19	1	12	16	15	10	12	14	15	11	18	21	17	18	18	288
2	M Vya	21	1	3	12	14	18	1	1	21	21	13	21	16	12	4	15	20	15	17	16	262
3	Da S	18	11	9	17	13	10	6	16	19	18	21	8	7	1	13	14	14	13	14	13	255
5	T An	16	20	16	15	16	4	1	8	9	11	15	4	9	18	1	20	15	16	21	19	254
4	Vi D	17	3	2	11	11	14	5	11	11	10	19	11	18	13	8	17	19	21	20	11	252
6	B Ma	19	6	14	13	15	12	3	10	17	19	8	18	12	6	1	13	13	14	13	14	240
7	Pe T	11	18	1	1	8	20	11	18	12	12	16	13	8	14	1	12	12	12	11	12	223
8	B Ec	7	7	18	14	12	9	1	9	4	4	17	16	20	16	2	11	11	9	12	21	220
9	Du B	20	4	12	5	1	11	2	5	10	7	4	17	15	17	3	16	17	19	16	17	218
10	P Po	1	13	1	1	7	8	9	15	8	8	18	2	17	2	1	21	18	18	19	15	202
11	L Ve	5	12	10	6	1	7	12	3	13	13	5	1	19	4	1	19	16	20	15	20	202
12	P Da	15	5	6	10	10	21	7	13	15	16	12	6	11	3	1	10	7	8	10	8	194
13	K Vi	2	15	13	16	18	17	1	1	7	5	9	19	13	7	9	7	8	11	9	10	197
14	Is S	10	16	17	7	5	6	13	19	6	9	14	20	5	5	1	6	9	7	7	9	191
15	Gd D	12	9	8	9	6	15	8	14	14	14	7	15	4	8	1	3	6	10	6	6	175
16	Al V	8	10	5	4	2	13	10	17	2	2	11	7	3	19	10	4	10	5	8	5	155
17	Kl M	3	2	7	3	9	3	4	7	18	17	3	3	21	21	7	2	5	6	5	7	153
18	K El	4	17	4	8	3	2	1	6	5	6	20	9	6	9	1	9	4	4	3	4	125
19	K An	1	14	1	1	1	1	1	4	20	20	1	14	10	10	1	8	1	3	4	3	119
20	K Ek	6	19	1	1	4	5	1	2	3	3	6	10	2	11	6	6	2	1	3	2	94
21	El A	9	21	11	2	1	1	1	1	1	1	2	5	1	20	1	1	3	2	1	1	86

ing bag. The decision-making speed was recorded in milliseconds (386-680).

The second mode (30 s) "fight in the ring" included a simultaneous confrontation of 3 athletes in the ring. Each corner of the ring, equipped with a BlazePod sensor, lit up in 3 different colors (blue, red, green). The task of each boxer is to extinguish his color by touch (pre-negotiated), the boxer who covers the most sensors wins. The fight in the ring took place simultaneously in three rings of 3 circles, which made it possible to involve 9 athletes. The winners of each ring received 1 point and moved to ring No. 1, the second places received 2 points and met in ring No. 2, and, accordingly, the losers sorted things out in ring No. 3, having 3 points in their arsenal. The athlete with the lowest number of points rose in the ranking and went to the next round of the competition until the winner was revealed.

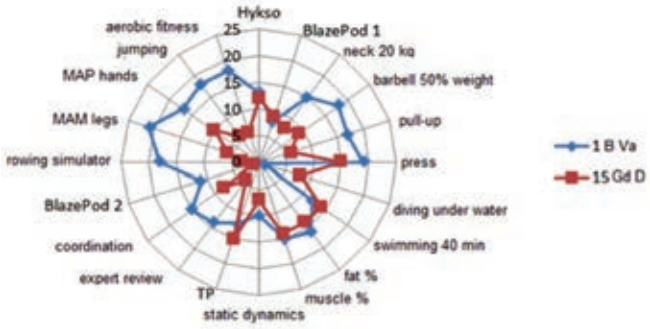
In the third exercise, HYKSO trackers were used to assess the number of hits (tapping test) in a boxing pillow for 30 s, their range was (182-280).

The fourth exercise in the form of an interval-test training 12 ITT (2-4, 3-4, 2-5) consisted of working on a boxing bag and included 12 intervals in different pulse zones, which were held under the control of Polar H-10 heart monitors with Polar Team software. The rating was determined by the time to complete the specified intervals in minutes 12 ITT3-4 (6:15-8:20), 12 ITT2-4 (8:28-18:15), 12 ITT2-5 (13:09-22: 40) [8].

Results of the study and their discussion. The indicators of general physical fitness had the following boundaries: pull-ups on the bar (1-14), bringing the legs to the bar "press" (1-28), throwing the bar 20 kg from the chest in 1 min (13-61), lifting the barbell to the chest 50 % of own weight (1-37), swimming 40 minutes (m) (500-1250), swimming "dive" under water (m) (6-33.5), an exercise consisting of static-dynamic push-ups alternating every 30 seconds in lying and squats to failure in minutes (16:25-62:00) (see table). Based on the results shown in the proposed exercises, the athletes were assigned an individual rating, where the best result was 21 points.

The current survey was conducted at the Innovation Center of the Russian Olympic Committee in Kislovodsk. The body composition analysis was carried out on 05/16/2022 and 05/24/2022, the rest of the tests were carried out as part of the training process on 05/20/2022.

To determine the level of aerobic fitness, a step test on a treadmill was used, the final rating was determined by the sum of the rating for the following indicators: MOC, HR ANOT, time on the course, % HR ANOT from HR max. The strength index rating was determined using carpal dynamometry. The height of the jump from a place, the elasticity index and the consistency index were determined using optical sensors Microgate OptoGait system, rating points were awarded based on the sum of jumps from three initial positions. The anaerobic performance of the arms and legs was determined on a Monark Ergomedic 894E bicycle ergometer, they are reflected in the table as “MAP arms” “MAP legs”, the rating score was composed of 4 indicators: peak, relative power (W and W/kg), time to reach peak power (ms) and speed at peak power (rpm). In the maximum step test on the rowing machine, time and power to failure were evaluated, without taking into account the weight of the athlete. The quality of the balance function is calculated by the StatMed 2.0 program using the analysis of the center of pressure displacement vectors relative to the coordinate axes, three indicators were taken to calculate the rating: balance with open eyes, eyes closed and the M test (ability to assemble in an extreme situation). In the table and figure, it is designated as coordination.



Individual fitness profile of two members of the Russian women's national Thai boxing team

Throughout the training event, the rating of athletes was determined based on the results of each test. At the end of the training camp, an overall rating was summed up based on the sum of the places taken. Based on the places taken in the battery of tests, an individual fitness profile was compiled for each athlete (see figure).

An individual profile built on ranking values allows you to visually see the strengths and weaknesses of the preparedness of athletes. However, after conducting a correlation analysis between the expert assessment and the proposed exercises, only one strong

relationship was found 0.71 with the anaerobic performance of the hands recorded on the Monark Ergomedic 894E bicycle ergometer. This circumstance prompts us to look for new forms of informative exercises that are as close as possible to competitive activity, which requires additional research to assess the quality of preparedness in Thai boxing.

Conclusions. The training process, with the inclusion of test tasks, additionally motivates athletes to perform the load with dedication, and the proposed control over preparedness in the form of a set of rating points allows you to visually assess the athlete's preparedness profile, identifying his strengths and weaknesses from the sample of the Russian national team.

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New approaches in assessing the coordination abilities of student youth

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Abstract

Objective of the study was to determine the effectiveness of the test for assessing the coordination abilities of students of higher educational institutions.

Methods and structure of the study. The experiment involved 5-year students of universities in the city of Belgorod in the amount of 300 people. They were offered to perform motor and computer test tasks.

Results and conclusions. During the training of pilots, the "Gorelov Test" was used for a comprehensive assessment of coordination abilities. It was proposed to use this test to assess the coordination abilities of students. As a result of testing, data were obtained, the average time of the test in girls is better (7.92±0.25 s) than in boys (8.31±0.33 s). The average time spent on fulfilling 1 stimulus out of 9 was also calculated. And in this indicator, the time for girls (0.88±0.02 s) is better than for boys (0.92±0.03 s). When performing the test, the girls made fewer mistakes. It can be said that the Gorelov Test makes it possible to assess the coordination abilities associated with the body's ability to coordinate motor actions. As a result of the study, a comprehensive method for assessing the coordination abilities of students was determined. Validity assessment of the Gorelov Test showed a high correlation with a number of motor and computer tests.

Keywords: *physical training; coordination abilities; cadets; assessment of the level of preparedness; modified test; educational organizations of the Ministry of Internal Affairs.*

Introduction. Improvement of students' coordination abilities is an integral process of physical training and physical education. Modern studies [1, 2] indicate a close relationship between the effective mastering of educational material by students with timely diagnosis and improvement of coordination abilities by means of physical culture and sports.

Undoubtedly, a large role is assigned to coordination abilities in professional activity [3, 4]. Every day, specialists have to perform a complex of various motor actions. From coherence, which will depend on the effectiveness of professional activity [5, 6].

Bernstein N.A. noted that "coordination of movements is ensured by the interaction of all structures of movement construction due to sensory integration of the structures of the central nervous system" [7]. It can be said that coordination abilities mean a person's ability to accurately and quickly, efficiently and resourcefully solve various motor tasks [8, 9].

The development and improvement of physical abilities should take place under the full control of teachers providing the educational process [5]. Unfortunately, in educational organizations, regulatory documents provide for determining the level of development of coordination abilities only by shuttle running (10×10 meters, 4×20 meters). These test tasks cannot comprehensively assess the coordination abilities of young people. In this connection, there is a problem in finding effective means of assessing the development of coordination abilities in students.

Objective of the study was to determine the effectiveness of the test for assessing the coordination abilities of students.

Methods and structure of the study. In order to solve a certain problem, it was proposed to analyze literary sources in order to find informative means and methods for assessing the level of development of coordination abilities.

To test the proposed assessment method, 300 students from Belgorod universities were involved. Mostly students of the 5th year took part in the study.

They were offered to perform test tasks that allowed them to evaluate through motor actions "sense of time" (stop the stopwatch without visual control at certain marks), "sense of space" (three jumps of different lengths were performed), static coordination (Romberg's test), shuttle running 10×10 m, 4×20 m.

And it was also proposed to perform a number of test tasks using the "BioMouse Research": simple sensorimotor reaction (SSR), complex sensorimotor reaction (CSR), reaction to a moving object (RMO), distribution of attention (AD) and number addition (NA).

Results of the study and their discussion. An analysis of literary sources made it possible to reveal that during the training of pilots the "Gorelov Test" was used for a comprehensive assessment of coordination abilities. Currently available sources do not indicate that this test is widely used in the diagnosis of coordination abilities.

The essence of the test is to move by jumping, on specially prepared squares, for a while. Numbers are depicted on the squares, the number of squares was limited to 9. The task was to move, jumping on two legs, through the squares in ascending order from 1 to 9 or in descending order. At the beginning of the test, the subject did not see the location of the squares, and when performing a new attempt, the squares changed places. The total time spent on the test, the number of errors, and the average time to complete one stimulus were measured. Each subject was asked to perform three attempts, from which the average time was calculated. All measurements were performed with an electronic stopwatch.

As a result of testing, data were obtained, which are reflected in the table. As can be seen from the results obtained, the average test execution time for girls is better (7.92±0.25 s) than for boys (8.31±0.33 s). Also, the average time spent on the fulfillment of 1 stimulus out of 9 was calculated. And in this indicator, the time for girls (0.88±0.02 s) is better than for boys (0.92±0.03 s). When performing the test, the girls made fewer mistakes.

Validity was assessed for this test. The study involved students of 5 courses in the amount of 300 people. They were asked to complete other test tasks in addition to the Gorelov Test. Results that were compared using correlation analysis.

Results of the study and their discussion. On fig. Figure 1 shows the levels of connection between the results of the "Gorelov Test" and test tasks, which made it possible to evaluate coordination abilities through motor actions.

As can be seen from the presented figure, a high positive relationship was noted in the tests shuttle run 10 × 10 m (r - 0.55), 4 × 20 m (r - 0.57), the average positive relationship "sense of space" (r - 0.48).

It can be said that the "Gorelov Test" makes it possible to assess the coordination abilities associated with the body's ability to coordinate motor actions. On the other hand, after the "Start" command, the subject needs to evaluate the entire area with numbers and correctly perform jumps over the squares. Also during the test, the subjects realize that this test is performed as quickly as possible for the time being.

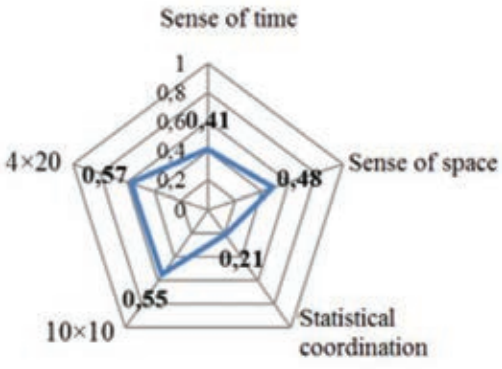

Figure 1. *The relationship of motor tests with the "Gorelov Test"*

Figure 2 shows the levels of connection between the results of the "Gorelov Test" and test tasks that were performed using the "BioMouse Research".

There is a high positive relationship in tests using "BioMouse Research", addition of numbers (r - 0.55), distribution of attention (r - 0.52) and reaction to a moving object (r - 0.47).

The presented battery of tests evaluated the relationship of the Gorelov Test with the cognitive processes of students. It can be said that when performing the Gorelov Test, the subjects need to evaluate the location of the squares, for which the distribution of attention is responsible, think over the algorithm of

The results of testing cadets in the "Gorelov Test"

	Execution time, sec	**Average execution time of 1 stimulus,** sec	**Errors,** number
Girls	7,92±0,25	0,88±0,02	0,2±0,01
Youths	8,31±0,33	0,92±0,03	0,3±0,01

their actions, then correlate their movements for an accurate jump, with minimal time costs.

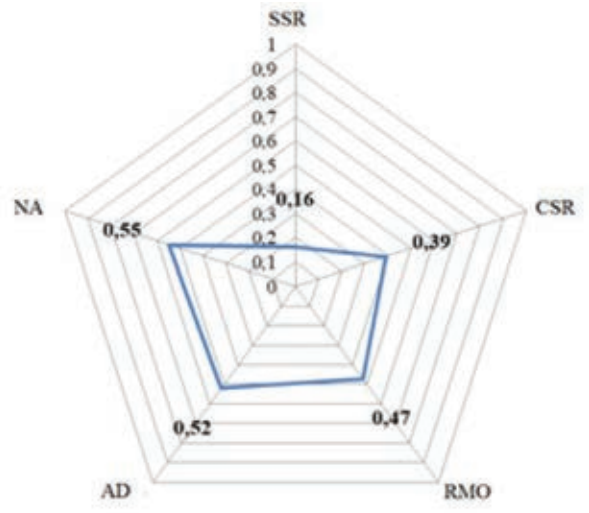

Figure 2. *The relationship of computer tests with the "Gorelov Test"*

Conclusions. As a result of the study, a comprehensive method for assessing the coordination abilities of students was determined. Validity assessment of the "Gorelov Test" showed a high correlation with a number of motor and computer tests.

Subsequent research and calculations should allow the development of a rating scale for the test. And as a result, the presented test can be recommended in the educational process of students of higher educational institutions for the purpose of a comprehensive assessment of coordination abilities.

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Structural-contental definiteness of actualization of athletes' thinking types in the context of the system-activity approach

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Abstract

Objective of the study was to substantiate the conjugation of the types of thinking in the context of the structural-content components of the athlete's activity in the implementation of intellectual tasks in the process of learning motor actions.

Methods and structure of the study. In the course of scientific work, questioning and interviewing of coaches were carried out on the issues of updating the types of thinking in adolescent athletes in the structural components of activity. 34 sports coaches took part in the study.

Results and conclusions. Analysis of the results showed that the largest factorial weights in improving the technique of a sport are characterized by: to understand the significance of the process of improvement - strategic (0.897); for the implementation and adjustment of the program of behavior - situational / practical (0.843), prognostic (0.877), spatial (0.724), figurative (0.766), critical thinking (0.747). At the same time, it is noted that taking into account the peculiarities of the manifestation of the types of thinking in young athletes in the implementation of the intellectual tasks of sports activities will allow to identify the most problematic areas of the coordinated anticipatory involvement of the types of thinking in segments of the structural components of the activity and optimize the process of learning the technique of motor actions, as well as improve individual technical and tactical skills. athlete.

Keywords: *types of thinking, sports activity, motor actions technique, training, improvement.*

Introduction. The issues of development of types of thinking that are relevant in sports activities are extremely important for improving the training of a sports reserve and high-class athletes and are considered by a number of scientists. E.V. Bystritskaya and S.D. Neverkovich pay attention to “subject-target and problem-situational forms of thinking orientation.., the development of critical thinking aimed at oneself, the object and the situation...; development of adequate requirements for oneself on the basis of correlating social requirements, one’s inclinations, needs, abilities, preferences and developing a set of acts of self-government... on the basis of abstract-logical and critical thinking” [2, p. 144]. S.V. Dmitriev, S.D. Neverkovich in “the structure of the ontodidactic process of training an athlete, there are: reproductive-performing, adaptive, project-performing, criteria-evaluative levels and the level of self-building of the personality”, associated with types of thinking. The activity-organized thinking and self-consciousness of an athlete determine the content of universal regulators of perception, thinking and activity, which allow solving motor problems” [3, p. 32]. Creative thinking, according to N.I. Chernetskaya is “both divergent, and lateral, and prognostic, and productive – the result of the integration of its individual types and forms. The essence of higher forms of thinking, including prognostic, according to A.V. Brushlinsky, is to create subjectively new results” [8, p. 73]. According to Yu.M. Orlov, an important context of thinking is its sanogenicity as a cognitive process of searching for resources or possible prospects in complex, critical situations of action or activity, ... a positive thinking style that allows a person to highlight positive components in any situation, to determine the possi-

bilities for further development" [7, p. 20]. A.A. Zvezdin and O.V. Nikolaeva consider the type of thinking as a determinant of behavior in extreme situations [4, p. 92] in sports.

It is obvious that all types of thinking are important given their situational relevance, but the question is how they combine, complement each other and what is the basis for their systemic mutual construction? In this regard, it is important to consider the types and components of an athlete's thinking in the context of the principle of systemogenesis (P.K. Anokhin's theory of functional systems) [1], according to L.I. Kostyunina, which determine "the advanced development of functional systems that provide mental activity" [6, p. 26]. This leads to further research into the question of thinking in sports in terms of its correspondence to the structural components of activity in solving specific problems [5].

The architectonics of conjugation of types of thinking in the structural components of sports activities, taking into account the adaptive behavioral act (P.K. Anokhin, 1968) at the stages of mental abilities realization (V.D. Shadrikov, 2007)

Stages of realization of the intellectual and motor task in conjunction with the types of thinking	Structural components of sports activity through:		Actual types of thinking									
	the prism of an adaptive behavioral act, P.K. Anokhin [1]	the implementation of mental abilities, V.D. Shadrikov [9]	Conceptual, 0.690	Abstract-logical, 0.833	Visual-effective, 0.691	Logical, 0.558	Theoretical conceptual, 0.831	Figurative, 0.801; 0.766	Prognostic, -0.728; 0.877	Spatial, 0.724	Creative/productive, 0.762	Tactical, 0.787	Strategic, -0.812; 0.897
	1. Afferent synthesis: motivation (consciousness), situational afferentation (image: memory, sensation, perception), triggering afferentation as readiness for behavior	1. Meaning, purpose, motive of activity											
		2. Reflection of reality		Situational, practical, 0.843			Theoretical figurative, 0.636						
	2. Decision-making stage (determines the type and direction of behavior), formation of a plan and program of behavior	3. Decision making											
	3–4. Formation of the apparatus of the acceptor of the results of action (**A**), stage of the action program: efferent synthesis	4. Formation of the program											
	5. Performing an action, behavior programs: effector excitation, volitional activity, purposeful behavior, formation of A	5. Correction of the program of behavior	Critical, 0,747										
	6. Result A	6. Reflection operation			**Абстрактно-логическое, 0,833**			Figurative, 0.766					
	7–8. Result parameters (comparisons determine the construction of further behavior)	7. Reflection of the result of the operation											
		8. Reflecting results parameters											
	9. Reverse afferentation - assessment of the achieved result	9. Evaluation of the achieved result											
	10. Setting if results don't match action acceptor	10. Installation, enrichment of operational mechanisms											
Scales of motor: act, operation, action, segment of activity													
The scale of holistic motor activity													
The scale of motor activity													

Tendencies of success in solving intellectual and motor tasks at the stages of training activity

<table>
<tr><th>TD stages, according to V.D. Shadrikov [9]</th><th>% of coaches' elections</th><th colspan="7">Accumulative (cumulative) effect of (not) corresponding to the intellectual and motor task modes of action and activity</th></tr>
<tr><td>1.1. Meaning, purpose,
2. activity motive</td><td>8</td><td>±</td><td colspan="6">«+» – correct formation of meaning, purpose, motive in the structure of sports activities;
«–» – incorrect understanding of the essence of motor tasks in phases, in the purpose of motor action, in the motive of motor activity;</td></tr>
<tr><td>3.2. Reflection
4. reality</td><td>11</td><td>±</td><td>±</td><td colspan="5">«+» – correct cognitive processing of information;
«–» – incorrect cognitive processing of information, lack of completeness of perceived parameters to create an image of a motor action;</td></tr>
<tr><td>3. Decision-making
4. Formation of the program</td><td>24</td><td>±</td><td>±</td><td>±</td><td colspan="4">«+» – situationally correct decision making;
«–» – making an incorrect decision without regard to the conditions;
«+» – the program of integral action is formed correctly;
«–» – the program does not show the integrity, ergonomics, structural connection of the phases of motor action;</td></tr>
<tr><td rowspan="2">5. Performing an action and program correction behavior (BP)</td><td>21</td><td>±</td><td>±</td><td>±</td><td>±</td><td colspan="3">«+» – effective execution of the action;
«–» – inefficient execution of the action;</td></tr>
<tr><td>19</td><td>±</td><td>±</td><td>±</td><td>±</td><td>±</td><td colspan="2">«+» – situationally adequate correction of BP;
«–» – implementation of an incorrectly chosen action, ineffective adjustment of the BP;</td></tr>
<tr><td>6. Reflection operations</td><td>17</td><td>±</td><td>±</td><td>±</td><td>±</td><td>±</td><td>±</td><td>«+» – there is no need for adjustments, the actions are performed correctly, effectively;
«–» – the intellectual and motor task was solved with (not) significant errors, all (part of) the stages (s) were performed (s) (not) in accordance with the goal</td></tr>
<tr><td colspan="2">Intellectual and motor task not solved</td><td colspan="6">«–» In multiple choice conditions «+»</td><td>Intellectual and motor task solved</td></tr>
</table>

Objective of the study was to substantiate the coordination of types of thinking in the context of the structural and content components of an athlete's activity, taking into account the success of solving an intellectual problem in sports.

Methods and structure of the study. In the course of scientific work, questionnaires were conducted, interviews of trainers on the issues of updating the types of thinking in adolescent athletes in the structural components of activity; descriptive statistics; factor and cluster analysis. The study involved 34 coaches in sports (according to the classification of T.T. Dzhamgarova, A.Ts. Puni, 1979).

Results of the study and their discussion. At the first stage of the study, the architectonics of conjugation of the types of thinking in the structural components of sports activity at the stages of training and improvement by young athletes of the technique of motor actions was revealed. The trainers were presented with a detailed description of the manifestations of each type of thinking and were given the task to determine their localization in the structural components of activities related to training and improvement of technical actions. In the process of questioning, the assessment of significant types of thinking was carried out according to the following criteria: 1 point - low, 2 points - medium, 3 points - high significance, which were distributed in the range (xav ±) - 2.52 ± 0.506 - 2.18 ± 0.386. The subsequent generalization of the results made it possible to fix (see the figure) that the largest factor weights in teaching the technique of a sport are: for understanding the mode of action - abstract-logical (0.833), theoretical conceptual (0.831), figurative (0.801); to create a program of behavior - tactical (0.787), creative / productive (0.762), predictive (0.728); to comprehend the prospects - strategic thinking (-0.812).

The largest factor weights in the process of improving the technique of a sport have: to understand the significance of the process of improvement - strategic (0.897); for the implementation and adjustment of the program of behavior - situational/practical (0.843), prognostic (0.877), spatial (0.724), figurative (0.766), critical thinking (0.747).

At the subsequent stages of the study, the assumption was confirmed that the success of the activity components simplifies the structure of the actualized types of thinking, and the failure causes cognitive dissonance, actualizes critical and reflective thinking, complicates the structure of mental activity, taking into account the situationally important adjustment of sports activity (see table).

The above generalized characteristics of options for successful execution of an intellectual task without specifying its content allows us to note that any of the stages may contain selection or execution errors, and

each of the following stages can also optimize the current situation by timely correction of the parameters of intellectual and motor activity.

Conclusions. In the course of the study, high factor weights of all types of thinking were determined in solving particular problems of training and improving the technique of performing motor actions, and the architectonics of conjugation of types of thinking in the structural components of sports activity was revealed. The certainty of the basic clusters that trigger mental activity in the process of learning and improvement characterizes the specifics of solving intellectual problems in sports by teenagers. Insufficient development of one or another type of thinking hinders the successful solution of intellectual tasks by young athletes of a particular segment of sports activity and worsens its overall performance. Larger types of thinking include smaller types and a larger volume of structural components of sports activity, characterizing its completeness, integrity and completeness. Taking into account the peculiarities of the manifestation of the types of thinking in young athletes in the implementation of the intellectual tasks of sports activities will optimize the process of learning the technique of motor actions.

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Psychophysiological peculiarities of adolescent athletes of different sports specialization

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Abstract

Objective of the study was to identify the psychophysiological characteristics of adolescent athletes of various sports specializations.

Methods and structure of the study. The scientific work was attended by 144 athletes involved in the sports sections of the city of Kirov: boxing, sambo, swimming, rugby and hockey. The psychophysiological status of young athletes was assessed using the psychophysiological testing device UPFT-1/30 - "Psychophysiologist". Based on the performed tests (tapping test, simple visual-motor reaction and reaction to a moving object), the functional state of the nervous system of the studied contingent was assessed.

Results and conclusions. Most adolescent athletes (with the exception of swimmers) have low stability of reactions and, as a result, a low ability to regulate processes in the nervous system. An assessment of the values of the reaction to a moving object (RMO) showed that, judging by the balance coefficient in most of the children we studied, the processes of inhibition prevail over the processes of excitation. The exception was sambists, in whom excitation prevailed over inhibition, i.e. they had more lead reactions than lag reactions. Consequently, sambo classes develop a strategy of anticipation in young athletes. Thus, the specificity of practicing different sports not only imposes certain requirements on the psychophysiological state of a young athlete, but also, in turn, influences this state in one way or another.

Keywords: *psychophysiological characteristics, adolescent athletes.*

Introduction. The specifics of training young athletes in different types of sports specialization imposes certain requirements on them in the development of psychophysiological qualities that would allow them to be successful in this sport [1, 2]. The main parameters characterizing the psychophysiological status of an athlete are indicators of the functional state of the nervous system, since they are the basis for the successful implementation of motor activity [1, 3]. This is especially true in adolescence, when there is a rapid development of most physical abilities and motor qualities [4, 5, 6].

It should be noted that there are no age standards for psychophysiological parameters for children of different ages, genders and sports specializations, which greatly complicates the ability to characterize various aspects of their psychophysiological processes that directly affect the solution of tasks [1].

Objective of the study was to identify the psychophysiological characteristics of adolescent athletes of various sports specializations.

Methods and structure of the study. The study was conducted in the 2018-2019 academic year, it was attended by teenage athletes aged 13-15 who were engaged in boxing (30 boys), sambo (30 boys), swimming (33 boys), rugby (26 boys) and hockey (25 boys) in sports schools in Kirov. The work was organized on the resource base to conduct research on the morpho-functional state of people involved in physical culture and sports at the Vyatka State University in the morning, with the consent of the parents and the coach, in compliance with the principles of unity of requirements and confidentiality. Mathematical processing of the results of the study was carried out using Microsoft Excel 2003 software, the significance of differences in indicators was determined using Student's t test (t).

The assessment of the psychophysiological status of adolescent athletes was carried out using the psychophysiological testing device UPFT-1/30 - "PSYCHOPHYSIOLOGIST" of the research and production and design company "Medicom MTD", Taganrog, and included an assessment of a number of psychomotor indicators: A) Assessment of the strength of nervous processes by measuring the dynamics of the rate of movements of the subject's hand, which was carried out using the express method "Tapping test"; B) Assessment of the functional state of the central nervous system according to the parameters of a simple visual-motor reaction (SVMR), which characterizes the level of activation of the central nervous system; C) Evaluation of the athlete's ability to adequately perceive changes in space-time events, as well as individual characteristics of the organization of the nervous system in terms of the speed and accuracy of response to a moving object, namely the balance of the nervous system in terms of the degree of balance of excitation and inhibition processes, which were carried out according to the parameters of the reaction to a moving object (RMO).

In most works on the physiology of sports, a tapping test is used to assess the properties of the nervous system of athletes [1, 7]. In psychophysiological science, the ability to perform actions at the fastest pace is regarded as an indicator of speed (quickness) and, according to A.A. Ukhtomsky, the number of movements that a living system performs per unit time serves as a characteristic of its lability, and this, in turn, characterizes the resistance of young athletes to monotonous activity [2, 4]. The tapping test is performed continuously for 30 seconds, first with the right hand and then with the left. This time is divided into 6 stages of 5 seconds, each of which fixes the duration of the time intervals between beats and the number of beats at each stage. On their basis, the indices of the efficiency of the nervous system (EfI), the strength index of the nervous system (SI), and the endurance index of the nervous system (EI) are calculated [7].

Results of the study and their discussion. It was shown that sambo wrestlers had the highest work efficiency, their frequency of strikes in 5 s was 6.24±0.07 times, and hockey players were the least (5.60±0.11 times, $p \leq 0.05$) (Table 1). Based on the results obtained, sambists (1.02±0.003) and hockey players (1.03±0.009) had the greatest strength of the nervous system, i.e. the players of these sports were more able to withstand intense and prolonged competitive and training loads, in addition, they needed less time to recover from such loads (Table 1). The nervous systems of sambists (0.91±0.007) and rugby players (0.91±0.022) had the highest endurance, while this indicator was the lowest among hockey players (0.86±0.009, $p \leq 0.05$, Table 1). Thus, the sambists studied by us had better work efficiency, strength and endurance of nervous processes, which allows them to successfully cope with training and competitive tasks.

When studying the indicators of a simple visual-motor reaction, it can be seen that the absolute reaction

Table 1. *Indicators characterizing the properties of the nervous system according to the tapping test in adolescent athletes involved in various sports, M±m*

Type of sport	Average beat frequency (number):		Amount of strokes (number)		Efficiency index	Strength index	Endurance index
	Right	Левая	Right	Левая			
Boxing n=30	5,71±0,09	4,94±0,07	171,2±2,64	148,2±2,38	5,71±0,09	0,98±0,009	0,86±0,006
Sambo n=30	6,24±0,07	5,49±0,05	187,2±2,12	164,6±1,50	6,24±0,07	1,02±0,003	0,91±0,007
Swimming n=33	5,97±0,03	5,09±0,06	178,9±1,02	153,0±1,79	5,97±0,03	1,00±0,004	0,88±0,004
Rugby n=26	5,67±0,18	5,08±0,12	170,0±5,40	152,1±3,49	5,67±0,18	1,00±0,024	0,91±0,022
Hockey n=25	5,60±0,11	4,82±0,12	168,1±3,43	144,8±3,74	5,60±0,11	1,03±0,009	0,86±0,009
p<0,05	S-B, Sw, R, H; Sw-B, H	S-B, Sw, R, H; Sw-H	S-B, Sw, R, H; Sw-B, H	S-B, Sw, R, H	S-B, Sw, R, H; Sw-B, H	B-S, Sw, H; Sw-S, H	B-S, SW, R; S-Sw, H; H-Sw, R

Note: Here and in Table 2, 3 - differences between sports are significant S - sambo, B - boxing, Sw - swimmers, R - rugby, H - hockey).

Table 2. *Indicators of a simple visual-motor reaction in adolescent athletes involved in various sports, M±m*

Type of sport	ART (ms)	RMS RT (ms)	Me (ms)	Mo (ms)	AMo (%)	min RT (ms)	max RT (ms)
Boxing n=30	244,2±0,68	75,7±2,18	223,0±0,68	71,2±1,26	25,3±0,33	159,2±0,49	612,5±21,34
Sambo n=30	240,6±2,73	92,3±5,35	225,8±3,56	60,4±3,56	24,9±0,97	156,4±5,73	749,5±53,49
Swimming n=33	227,7±2,22	53,0±2,58	215,5±1,61	68,3±1,68	31,1±0,57	160,4±0,69	493,5±22,32
Rugby n=26	270,4±8,00	81,7±11,47	248,7±6,07	91,7±6,48	24,7±1,41	169,5±7,79	548,0±53,32
Hockey n=25	273,1±7,58	86,4±8,59	248,4±7,01	93,5±9,33	29,8±1,52	181,0±8,73	548,4±45,64
p<0,05	B, S-R, H; Sw-S, B, R, H	B-S; SW-B, S, R, H	B, S, Sw-R,H; Sw-S, B	S-B, Sw; B,S, Sw-R, H	B, S, R-Sw, H	H-B, S, Sw	B-Sw; S-B, Sw, R, H

Note: - ART - average reaction time, RMS RT - rms reaction time, Me - median, Mo - mode, AMo - mode amplitude, min RT - minimum reaction time, max RT - maximum reaction time.

time and the standard deviation of the reaction time were significantly less in swimmers (Table 2), which indicates the stability of their response to loads, unlike representatives of other sports specializations. Our results are consistent with the data of S.V. Kondratovich (2017), who studied 12-13-year-old football players [1]. However, according to her data, the spread of reaction time from minimum to maximum values lies in the range of approximately 50 to 70 ms. Whereas for our athletes it varies from 300 to 500 ms, i.e. for our athletes, regardless of sports specialization, the value of the maximum values of reaction time is much higher than that of athletes from Yekaterinburg. At the same time, the minimum values of the reaction time of athletes from Kirov and Yekaterinburg are practically the same. All this points to the low stability of the ongoing reactions in the adolescent athletes we studied and, as a result, to the low ability to regulate processes in the nervous system.

The indicator of reaction to a moving object (RMO) is informative for determining the individual characteristics of the organization of the athlete's nervous system. The assessment of the values of this test showed that, judging by the balance coefficient in most of the adolescent athletes we studied, inhibition processes prevail over excitation processes, the exception was sambo wrestlers, in whom excitation processes predominate (Table 3).

When distributing athletes within the studied sports groups according to the predominance of excitation, inhibition and balance processes, they found that excitation processes prevailed in 50.0±9.45% of samb-

Table 3. *Indicators of reaction to a moving object in adolescent athletes involved in various sports, M±m*

Type of sport	Number of normal reactions (number)	Percentage of normal reactions (%)	Average time it takes for a real reaction to deviate from an ideal one (ms)	RMS from ideal RT (ms)	RMO coefficient	Balance coefficient
Boxing n=30	20,5±0,36	58,3±1,03	46,8±0,70	71,5±1,06	1,17±0,03	1,32±0,04
Sambo n=30	19,1±0,53	54,9±1,58	44,6±0,74	73,1±1,49	0,83±0,06	0,82±0,06
Swimming n=33	18,8±0,53	53,7±1,50	52,0±1,29	79,6±1,88	1,39±0,05	1,28±0,06
Rugby n=26	19,5±0,82	55,6±2,34	44,9±1,68	70,0±3,27	1,17±0,16	1,40±0,32
Hockeyn=25	18,2±0,53	52,0±1,49	51,24±1,35	74,9±2,74	1,64±0,16	1,95±0,32
p<0,05	B-S, Sw, H	B-Sw, H	B, S-Sw, H; B-S	Sw-B, S, R	B,S-Sw, H; B-S	S-B, Sw, H; Sw-H

Note: - RMS from ideal RT - standard deviation from the ideal reaction time, RMO coefficient - coefficient of reaction to a moving object.

ists. In the representatives of other sports, inhibition processes prevailed: in 57.1±9.04% of boxers, in 63.6±8.38% of swimmers, in 46.2±9.78% of rugby players and in 56.0±9.93 % hockey players. Thus, in the sambo wrestlers we studied, the number of lead reactions was greater than the number of delay reactions, i.e. This sport develops a strategy of advancing in young athletes. Attention is drawn to the results of swimmers, among whom there were no athletes with a balance of nervous processes, while in representatives of other sports their percentage did not differ significantly and varied from 23% to 28%. Consequently, swimming does not contribute to the development of the balance of nervous processes.

Conclusion. The data obtained indicate the presence of features in the psychophysiological parameters of adolescent athletes aged 13-15 years of various sports specializations. The most significant differences were found in sambo wrestlers, who have high work efficiency, strength and endurance of the nervous system, and a predominance of excitation processes. The implementation of such studies not only allows expanding the database of psychophysiological characteristics of athletes of different ages, genders and sports specializations, but also helps the coaching staff to individualize the approach to athletes, which will directly affect the quality of the training process.

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Psychological training of wrestlers taking into account the types of temperament at the pre-competitive stage

UDC 796.853

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Abstract

Objective of the study was to determine the influence of the psychological training of Greco-Roman wrestlers on the basis of taking into account the types of temperament at the pre-competitive stage of the training process.

Methods and structure of the study. In a scientific experiment conducted with the help of a questionnaire, 30 sportsmen took part, engaged in Greco-Roman style wrestling, stages of improvement of sports skills and higher sports skills. To determine the types of temperament of spores, we used G. Eysenck's test.

Results and conclusions. In the Greco-Roman wrestlers of the experimental group, under the influence of the developed methodology on the basis of taking into account individual peculiar properties of the psyche at the pre-competitive stage, the state of mental readiness of the wrestlers changed statistically significantly with a confidence probability q= 0.95. The data obtained testify to the need for purposeful work to improve the sports training of Greco-Roman style wrestlers, taking into account the individual properties of the psyche.

Keywords: *psychological preparation, stage of preliminary preparation for competitions, types of temperament, individual properties of the psyche.*

Introduction. Studying the competitive activity of Greco-Roman style wrestlers, domestic experts note that in modern sports you cannot achieve high sports results only by increasing the volume and intensity of training loads [9, 12]. In this regard, more and more importance is attached to the psychological support of the training process.

The problem of improving the process of psychological and logical preparation of wrestlers for competitions has been repeatedly emphasized by scientific research [2, 3, 5, 6, 7], however, specific work on the preparation of wrestlers, taking into account the individual properties of the psyche there are no disputes between athletes, in particular wrestlers of the Greco-Roman style.

In connection with the foregoing, there is a need to search for new means and create, on this basis, new approaches in preparing sportsmen for competitions, taking into account the types of temperature.

Objective of the study was to develop a methodology for the psychological and logical training of Greco-Roman wrestlers on the basis of taking into account the types of temperament at the pre-competitive stage and experimentally substantiate its effectiveness.

Methods and structure of the study. Scientific work was carried out on the basis of the Sports School of the Olympic Reserve "Vityaz" named after M.Sh. Bibishev, Naberezhnye Chelny and the Sports School of the Olympic Reserve in Almetyevsk in the period 2019-2020. To determine the types of temperament of the wrestlers, G. Eysenck's test was used. The experiment involved 30 athletes, stages of improvement of sportsmanship and higher sportsmanship, of which two groups were formed: control and experimental, 15 wrestlers in each group. Athletes had a qualification not lower than I sports category.

The structure of the training microcycles included methods for regulating the mental state of the wrestlers, taking into account the types of temperament, pedagogical techniques were used, which were ways to optimize the training of the wrestlers.

In this study, G. Eysenck's test was used to determine the types of temperament, which is based on a complex disclosure of the psychological status of the sporesman. According to the test results, the experimental group was divided into 4 subgroups: sanguine (22%), choleric (27%), phlegmatic (41%) and melancholic (10%).

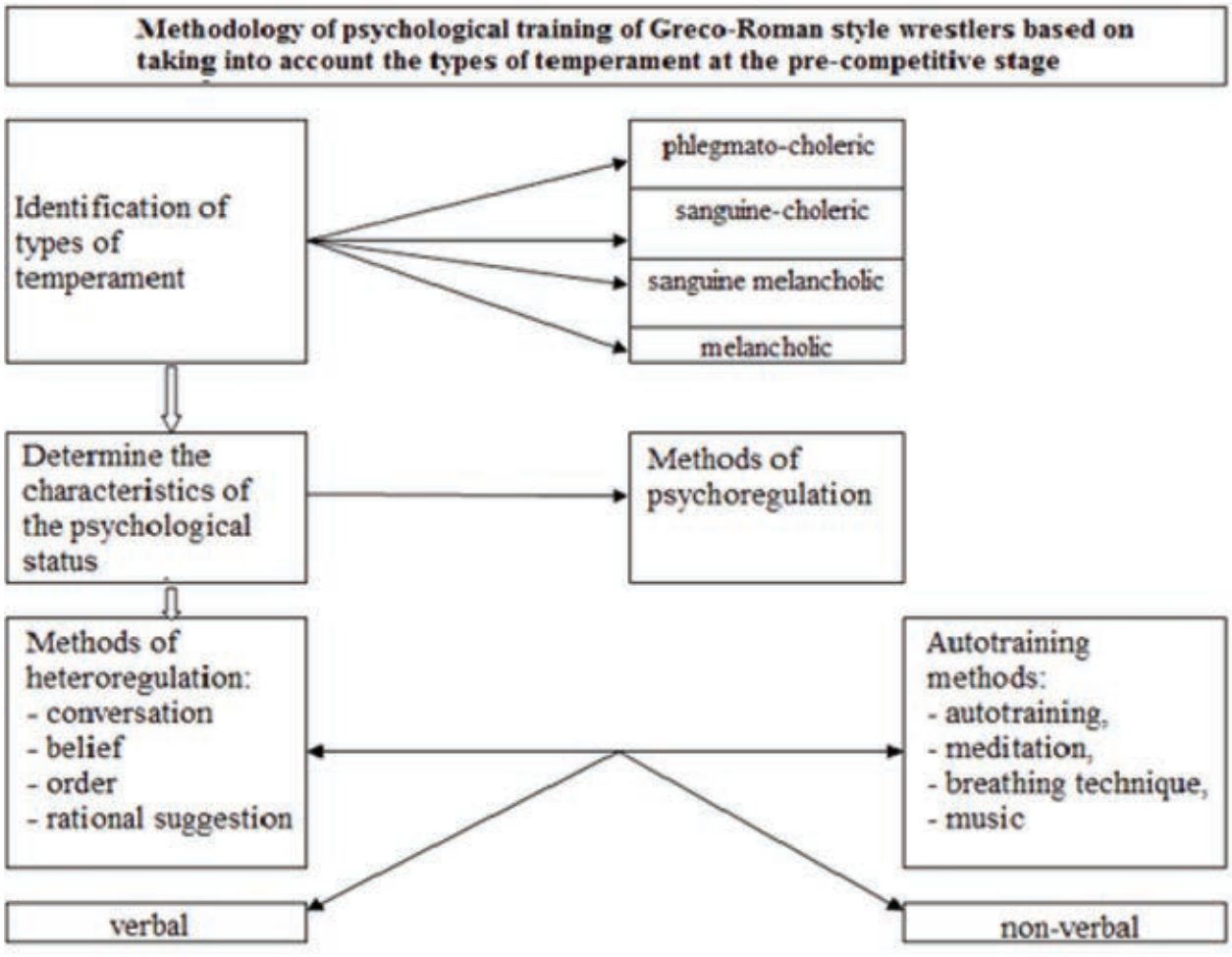
In the process of developing the experimental methodology, the mental o logical status of wrestlers was taken into account. The figure shows a general scheme of the developed methodology for the psychological training of wrestlers of the Greco-Roman style on the basis of taking into account and types of temperament at the pre-competitive stage.

The experimental methodology includes determining the types of temperament of Greco-Roman wrestlers, the nature of the mental and logical status, the methods of mental regulation, the stages of the formation of the state of mental readiness, taking into account the individual-peculiar properties of the psyche and pedagogical techniques used to implement the methods of psycho-regulation. The effectiveness of the experimental methodology was confirmed by the study of the state of mental readiness, personal and situational anxiety, psycho-emotional state and the effectiveness of the wrestlers' competitive activity during the experiment.

According to the results of the study, four types of logical groups spore smen s disputes were identified:

- strong mobile (sanguine-choleric introverts and intero-extroverts);
- strong inert (phlegmato-choleric);
- weak inert (melancholic);
- strong and weak inert (sanguine-choleric).

The pre competitive stage of wrestlers' training was chosen for the experiment. During this period, there is intense preparation for competitions and is characterized not only by ups and downs, but also by recessions after competitions.



Scheme of the methodology for the psychological and logical training of wrestlers of the Greco-Roman style on the basis of taking into account and types of temperament at the pre-competitive stage

Table 1. *Changes in indicators of the state of mental readiness of wrestlers in different periods of training (c.u.)*

Group	Indicators	On the eve of the competition	During the competition	t cr.
EG	The need for sensation	9,6±2,04	12,5±1,36	2,31
CG		9,3±1,81	9,7±1,45	
EG	well-being	5,7±1,05	6,6±0,96	2,31
CG		5,4±0,96	5,8±1,20	
EG	Activity	5,9±1,02	6,6±1,20	2,31
CG		5,5±1,30	6,0±1,55	
EG	Mood	5,2±1,24	6,2±1,14	2,31
CG		5,3±1,38	5,4±1,26	

During the formation of the state of mental readiness of the wrestlers of the experimental group, we solved the following tasks:

- analysis from information about the conditions of the upcoming competition and about possible opponents;
- the state and level of one's own readiness were diagnosed;
- the purpose of participation in the competition was determined.

To achieve the set goal, a set of special measures was used according to the developed methodology. The collected information about upcoming opponents was provided to the wrestlers taking into account their types of temperament.

Investigating the state of mental readiness of wrestlers in different periods of the pre-competitive stage, the processing of the results was carried out according to the following parameters:

- needs in search of sensations;
- indicators of self-feeling;
- activity and mood.

Results of the study and their discussion. Under the influence of the developed methodology for the training of wrestlers of the Greco-Roman style on the basis of taking into account individual peculiar properties of the psyche at the pre-competitive stage, the state of mental readiness of the wrestlers of the experimental group changed statistically significantly with a confidence probability q= 0.95 (Table 1).

Analyzing the dynamics of the state of mental readiness of the wrestlers involved in the experimental group, with the help of comparison, we revealed significant changes in all the parameters of the state of mental readiness considered by us.

The need to search for sensations or a tendency to take risks in the competitive period among the wrestlers of the experimental group significantly increases. It also increases self-feeling, activity and mood. This is due, in our opinion, to the fact that competitions play a significant role for wrestlers of all types of temperament, because hope to achieve a better result.

Changes in indicators of mental readiness of wrestlers of the control group, who trained according to an exemplary program of sports training for the type of sport "Sports wrestling" (discipline "Greco-Roman wrestling"), mental regulation of their mental ic state were engaged in on their own on their own. Their indicators of mental readiness change insignificantly, this can be seen from the presented Table 2.

Analyzing individual data obtained with the help of the above methodology, we found that the value of indicators of wrestlers in the control and experimental groups varies significantly. This is due to the fact that the main criterion and the leading component of the state of mental readiness is expressiveness in the desire to win the fight and in self-confidence.

Analysis of the indicators of the components of the state of mental readiness of the experimental group, we see that all of them increased during the competition, this is facilitated by setting goals for competitions, as well as between bouts in this competition and maintaining the setting on success.

Table 2. *Indicators of the state of mental readiness of wrestlers (c.u.)*

Researchedindicators	Competition period	
	Before the competition	During the competition
Goal Achievement Motivation	0,56±0,14	0,65±0,12
	0,57±0,14	0,57±0,12
Risk appetite	0,47±0,10	0,51±0,10
	0,45±0,12	0,48±0,10
Confidence	0,50±0,09	0,54±0,12
	0,51±0,07	0,52±0,07

Carrying out psycho-regulation within the framework of the implementation of the experimental methodology made it possible to qualitatively increase the level of the state of mental readiness of wrestlers of all types of temperament.

Conclusions. The adaptation of temperament to activity consists in the individualization of the requirements for a dispute. This is possible due to taking into account the individual characteristics of the athlete, including the properties of temperament, which will allow to form the individual style of the wrestler, and this is the key to high sports results.

Implementation of the methodology of mental o logical training of Greco-Roman style wrestlers on the basis of taking into account types temperament, the use of teaching techniques, content and means form formation of the state of mental readiness during competitions, competitions Struggle with overvoltage led to an increase in sportsmanship, an improvement in the state of mental readiness, which contributes to an increase in performance at competitions.

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Sacrifice for the sake of sports as a victim property of an athlete's personality

UDC 796.011; 159.99

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Abstract

Objective of the study was to identify the role of sacrifice for the sake of sport in maintaining the stability of the athlete's personality.

Methods and structure of the study. Active interview, case method and content analysis were used as methods. 40 interviews of athletes were analyzed, of which 30 were taken from the media, 10 were conducted by the authors of the study. In addition, 14 cases were analyzed in which elements of sacrificial behavior in athletes were recorded.

Results and conclusions. Six thematic groups of judgments have been identified that differ in content in terms of understanding the phenomenon of sacrifice among athletes. Among them: “avoidance of sacrifice”, “condemnation of sacrifice”, “pragmatic attitude towards sacrifice”, “understanding of sacrifice as a mission, as heroism”, etc. It is shown that not all variants of sacrifice ensure the stability of the athlete's personality. In particular, such varieties of sacrifice as "fictitious sacrifice" and "sacrifice for the sake of fear" perform a negative function.

Keywords: *sacrifice for the sake of sports, sports, athlete's personality, sports results.*

Introduction. In studies of the personality of an athlete, such components as strong-willed qualities, personality stability, endurance, and the desire to win are traditionally identified as particularly significant for him. This was reflected in everyday consciousness as myths about athletes-heroes and heroes [2].

However, recently attention has been drawn to other factors contributing to the stable functioning of the athlete’s personality both in the profession and outside it. These, in particular, include: aesthetic factors, implementation in gender roles, as well as the ability to sacrifice for the sake of sports. It is noted that a high willingness to make psychological sacrifices reduces the risks of mental disorders and psychological trauma [5]. At the same time, there are practically no studies in the literature on the content of the phenomenon of sacrifice for the sake of sports and its variants, except for negative victims of injuries [2]. Victims of doping also belong to the same type. Doping for the sake of a sporting result can be recognized as a victim for the sake of sport, since doping can lead to damage to health, but it is obvious that such a victim should be attributed to the socially condemned. There is a small percentage of research on sacrificing academic success when combining sports and higher education. The significance of these studies lies in the intention of the authors to indicate ways to minimize such psychological victims without reducing the level of sports achievements [4]. A separate aspect concerns Paralympians when their sacrifice for the sake of sport is glorified [3].

However, the topic of sacrifice for the sake of sport is clearly not limited to these options. In our empirical study, an attempt has been made to identify other types of psychological sacrifices for the sake of sport and to assess their significance for the formation and development of an athlete’s personality.

Objective of the study was to identify the role of sacrifice for the sake of sport in maintaining the stability of the athlete’s personality.

Methods and structure of the study. The methods used are an active interview, a case method and a meaningful content analysis. A total of 40 interviews of athletes were analyzed, of which 30 interviews were taken from the media, 10 were conducted by the authors of the study. 14 cases were selected, which reflected elements of sacrificial behavior in athletes.

Results of the study and their discussion. The data of interviews and cases were examined using content analysis, which resulted in six thematic groups: "avoidance of sacrifice", "condemnation of sacrifice", "pragmatic attitude to sacrifice", "understanding sacrifice as a mission, as heroism", "fictitious sacrifice" and "sacrifice based on fear", meaningfully differing in their understanding of the meaning of the phenomenon of sacrifice. The table below shows the selected thematic groups and their linguistic markers based on the results of interviews and case studies.

The marker "Avoidance of sacrifice" showed objectively significant professional attitudes for athletes, allowing them to neutralize the desire to sacrifice their health for the sake of results. Previously, we noted such a marker in successful elite tennis players [1]. The same markers also appeared in the cases we studied. Thus, the case of "Plushenko" proves the right choice of an athlete who refused to compete in individual competitions at the Olympic Games in Sochi-2014 due to pain in the spine, despite the threat of losing his sporting reputation.

The marker "Condemnation of sacrifice" reflects the opinion of the part of athletes who focus on the most safe sport. However, the entertainment of sports, attracting public attention to it, and its educational value are precisely related to the ability to overcome physical barriers, so mention of this factor was less common.

Conclusions. The data obtained indicate that the choice of the form of sacrifice, which is important for the stability of the athlete's personality, depends on the current conditions of sports activity, the sport and the health of the athlete. Because of this, it is impossible to single out the most productive options of sacrifice for the sake of sport for all cases of a sports career.

Note that some types of sacrifice have a clear negative context. These include, for example, fictitious sacrifice, as well as sacrifice due to fear of coaches, relatives and other people who sometimes pin not only sports hopes on an athlete, but are guided by material and other factors unrelated to sports.

Content analysis of the content of interviews and cases (markers signaling the attitude to the phenomenon of sacrifice)

Thematic group and its markers
Avoiding sacrifice:
– unnecessary sacrifices, sacrifices that do not bring results;
– health is more expensive than any results and preferences.
Condemnation of sacrifice:
– the rules of the competition should exclude all moments that can lead to injury to the athlete;
– there is no need to constantly raise the bar of sports records;
– you can't force an athlete to risk his health for the sake of a high result.
Pragmatic attitude to sacrifice:
– sacrifice in sports – part of a career
– sacrifice for the sake of ambition, being the first is prestigious;
– sacrifice for the sake of large reward resources (money, property and other benefits).
Understanding sacrifice as a mission, as heroism:
– it is necessary to sacrifice for the sake of the country's victory;
– only by sacrificing can you achieve high results.
Fictitious sacrifice:
– quit sports because of unrealized ambitions;
– against the background of unwillingness to give personal time to training, not to participate in higher-level competitions, hiding behind the mask of «I don't want to let the coach and the team down.»
Fear-based sacrifice:
- the loser will be discussed;
- relatives and (or) the coach will be unhappy.

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Increasing the effectiveness of group swimming lessons of a sports and health-improving orientation

UDC 797.2

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Abstract

Objective of the study was to determine the effectiveness of various approaches to planning sports and recreational activities in swimming in subscription groups.

Methods and structure of the study. To determine the effectiveness of planning classes in subscription swimming groups, testing of the motor and swimming readiness of those involved in primary school age 8-12 years old was used.

Results and conclusions. Classes in subscription swimming groups, built on the basis of the stages of initial training, preliminary and basic training with an emphasis on increasing the length of the swim segments, at each stage showed an advantage over the traditional approach based on the program of swimming initial training groups with an emphasis on mastering the technique of methods swimming, and have a healthier effect. Those involved in the experimental group ultimately had a higher level of swimming fitness, endurance and strength abilities.

Keywords: *swimming, subscription groups, sports and health-improving orientation, motor and swimming readiness, planning.*

Introduction. Swimming remains the most popular type of physical activity among schoolchildren, and most parents of younger students are interested in teaching swimming to children as a vital skill and strengthening their health through swimming. Swimming training takes place both in sports schools and in subscription groups of swimming pools [1, 2]. Classes in these groups are based on the principle of elementary training groups, however, subscription groups are supposed to attend twice a week with a lesson duration of one hour. As practice in swimming pools shows, most children who have completed a course of initial swimming training show a desire to continue further classes in order to increase their level of swimming preparedness. In this regard, there is a difficulty in planning and conducting classes due to the small number of hours per week.

Objective of the study was to determine the effectiveness of various approaches to planning sports and recreational activities in swimming in subscription groups.

Methods and structure of the study. The experimental base for the study was the swimming pool of Sports and recreation complex “Victoria” in the city of Yelets, where classes were organized in subscription groups of a sports and recreational orientation.

At the first stage of the study, 24 students of two groups were tested. The age of the respondents included in the subscription groups ranged from 8 to 12 years, approximately the same level of mastering the swimming skill and the level of motor fitness, which included children of different sexes. Since the initial level of children’s swimming readiness was low and the trainees could cover only a distance of 25 meters on the chest or on the back without stopping, the lessons in the control group were traditionally planned and conducted in accordance with the program of initial swimming training of the first year. In the experimental group, we divided the classes into stages, the first stage was carried out, as in the control group, but its duration was 12 weeks. In the future, classes

The final results of the swimming preparedness of those involved

Control exercises	After experiment		Reliability ($\rho \le 0,05$)		
	Control group n=9	Experimental group n=10			
	X± σ	X± σ	T_{cr}	ρ	t_s
100 m complex swimming (point)	3,94±1,2	3,82±0,9	2,11	>0,05	0,5
20-minute freestyle swimming (m)	605,56±52,7	720±42,16		<0,05	5,3

were carried out taking into account the stages of planning: preliminary training and basic training [4]. Each stage was distinguished by a change in planning in terms of the volume and intensity of the load performed, which was based on the planning recommended for sports and recreation groups of the Children's and Youth Sports School [3]. The main attention in the experimental group was given to a gradual increase in the length of the swim segments in various ways and an emphasis on the development of endurance.

The results of stage-by-stage control - mastering the technique of swimming and swimming a distance of 50 m by choice in the experimental group served as an indicator of the transfer of children from the stage of initial training to the stage of preliminary training. The duration of the pre-training cycle was 12 weeks. The ability to swim a distance of 200 m without stopping in any sports way served as an indicator of the transition of those involved to the stage of basic training. The duration of the basic training took all the subsequent time and lasted approximately 16 weeks. The main tasks of this stage were aimed at further improvement of the technique of sports swimming methods and at the formation of skills to swim a distance of up to 800 m.

Evaluation of the effectiveness of motor and swimming fitness was carried out using tests of general physical fitness and special physical fitness.

Results of the study and their discussion. The analysis of the data obtained showed that as a result of the final testing, there were significant changes in the motor fitness of those involved in both the control and experimental groups. Significant differences in motor fitness were observed only in testing speed-strength indicators (throwing the ball from behind the head) (Fig. 1, 2).

In testing swimming preparedness, the level of mastering the technique of swimming by all methods was determined in points when swimming 100 m in complex swimming. The technique of elements of sports swimming methods was evaluated on a five-point scale, the evaluation criteria were the most typical mistakes in swimming technique that occur during training.

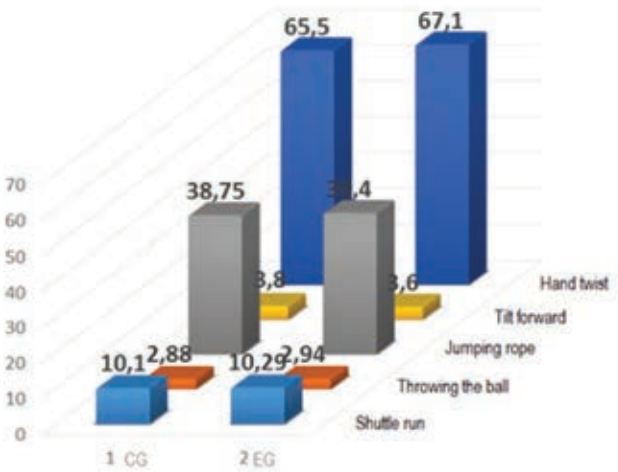

Figure 1. *The results of testing the motor fitness of the sports and recreation groups involved before the experiment*

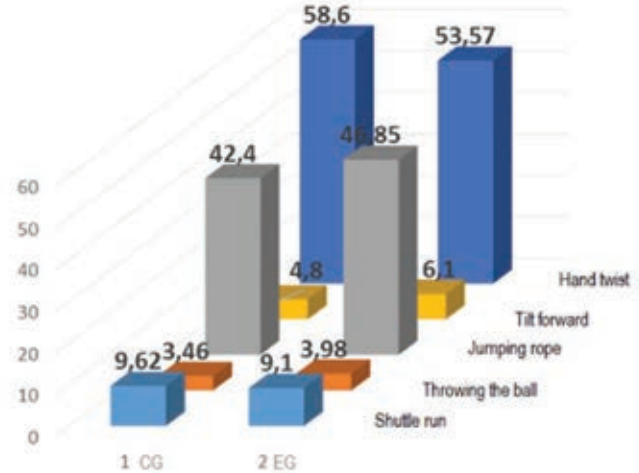

Figure 2. *The final results of testing the motor fitness of sports and recreation groups involved*

A comparative analysis of assessments of swimming technique showed that there were no significant intergroup differences in mastering the technique of movements (see table).

A significant difference in the final indicators is observed between the control and experimental groups in a 20-minute endurance swim. We see that the increase in motor fitness indicators is much higher in the experimental group, as evidenced by the results of the study.

Conclusions**.** The approach to planning classes in subscription groups based on the allocation of such training levels as preliminary and basic training led to a more significant increase in the swimming preparedness of those involved in comparison with the traditional approach based on the program of initial swimming training groups. Ultimately, this was reflected in a significant increase in the length of the swimmers' distance, an increase in their endurance and strength abilities, which, therefore, characterizes a greater healing effect.

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Independent motor-play activity of children 5-10 years old in the yard space

UDC

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Abstract

Objective of the study was to evaluate the use of the spatial environment and the motor experience acquired by children in educational institutions in independent motor-playing activities.

Methods and structure of the study. Observations were carried out on weekends, in the fall of 2022 in Belgorod, 682 children were covered, of which 395 were boys and 287 were girls aged 5-10 years. The results of observations were recorded in the protocol of observations. To analyze the results obtained, a ranking of the types of independent motor activity of children during walks in the yard was carried out.

Results and conclusions. The limited motor experience of preschoolers, the destruction of the play space of childhood, the disappearance of folk traditions in the organization of motor activity reduce the possibility of transferring spiritual values and attitudes through time and space, national experience in the organization of motor-play activity. Children do not master the order and rules of social behavior, interpersonal relationships. And, as a result, there are problems of social development of the personality, psycho-emotional stress, maladaptation.

Keywords: *independent motor-playing activity, yard space, ranking (gradation), children aged 5-10 years.*

Introduction. Motor-playing activity, as a part of human culture, is social in nature and in the ways of implementation. It is difficult to overestimate its importance in the physical, personal, social and communicative development of preschoolers and younger students.

Emotional richness, physical activity, real opportunities for the manifestation of initiative, independence, moral and volitional qualities, social and communicative abilities testify to the value of this traditional form and means of physical education of a growing person. At the same time, it is very important to determine and evaluate the nature of the types of independent motor-playing activity that occurs on the initiative of children in conditions of free choice. After all, it adequately reflects the motor-play experience of the child and the degree of transmission of family and national traditions of the organization of motor-play activity from the older generations to the younger ones.

Unfortunately, many researchers note the problem of the destruction of the play space of childhood [8], the disappearance of traditional folk outdoor games [5], the loss of the legal functions of the collective play space of the yard [7]. And, as a result, the emergence of difficulties in interaction between different ages, a decrease in the arbitrariness of behavior inherent in the children's community of the last century [6].

Earlier in our studies, an assessment was made of the influence of social pedagogical determinants on the development of motor activity [3]. At this stage, a study was made of the nature, content, direction of independent motor-playing activity in the space of the courtyard, the ranking of its types according to the degree of popularity (gradation).

It should be noted that playgrounds and sports grounds and bike paths are equipped in the courtyards of houses in the Western District of Belgorod for independent motor and play activities. In order to familiarize children with national traditions, preschool institutions and schools in the region are successfully

implementing game programs and technologies as part of the main educational program planned at the initiative of the participants in the educational process [2, 4, 9].

Objective of the study was to evaluate how the spatial environment and motor experience are used in the independent motor and playful activities of children.

Methods and structure of the study. The observations were carried out on weekends, in autumn (September-October 2022) in Belgorod. The total observation time was 48 hours, 682 children were covered, including 395 boys and 287 girls aged 5-10 years. The results of observations were recorded in the protocol of observations. To analyze the results obtained, a ranking of the types of independent motor activity of children during walks in the yard was carried out:

$$\Sigma\,(\mathrm{R}i) = \frac{N*(N+1)}{2} = \frac{5*(5+1)}{2} = 15\,,$$

Results and its discussion. In the first place was the position "Movement by bicycle and scooter". On the one hand, this can be regarded as a positive example of the development of non-motorized movement by children, which stimulates physical activity. However, without denying the importance of these physical exercises, we note that the lack of adult control over the dosage, landing, changing the push leg when riding a scooter can adversely affect the formation of posture. These are individual types of independent motor activity. They do not contribute to the development of social skills. There were practically no children's associations in this kind of physical exercises (see table).

In second place in the ranking were ball games. The most popular ball game in the yard is football and elements of this game. As positive aspects, we noted the following: the presence of child-adult interaction; self-regulation of physical activity; manifestation of initiative, activity, individual position of the child; high emotional saturation of motor activity.

The third place in popularity among children was occupied by motor-playing actions using slides, swings, lianas, etc. This once again emphasizes the urgency of the problem of organizing the spatial and object environment of the yard. It should be noted that short-term associations arose here, the manifestation of elements of creativity in motor activity was observed, children alternated different types of motor activity. Of course, they were under the control of parents, which is important for the prevention of injuries. The associations of children were of an unstable, temporary nature, as one or another equipment was used.

Isolated cases were outdoor games: "Catch up", "Hit the target" (children used chestnuts), as well as story games that require a well-thought-out scenario and distribution of roles. For the entire period of observation, children did not use jumping rope, "Classics", "Rubbers", elements of badminton, tennis. This also indicates a decrease in interest among children and parents in these types of physical exercises, which effectively affect the development of motor abilities. Polling and interviewing parents showed that most adults were able to name and explain the rules of only a few (2-3) folk and outdoor games.

Discussion. Observations testify to the insufficiency of children's motor experience in organizing independent motor activity. Games where you need to show resourcefulness, the ability to interact, ingenuity, dexterity, speed and coordination of movements have practically disappeared. We have not recorded the games traditional for previous generations of children ("Towns", "Burners", "Lapta", "Vybivnoy", etc.).

The ranking (gradation) of the types of motor-playing activities of children aged 5-10 indicates the popularity of movement on scooters and bicycles, as well as the widespread use of this equipment in families.

The increased interest of children and adults in playing football indicates the stimulating effect of socio-pedagogical determinants (equipped sports grounds, sports events, children-adult associations) [1, 11].

The importance of motor-playing activity in solving the problems of the harmonious development of the personality and the physical development of the child, strengthening his health is noted in a number of mod-

Ranking of types of independent motor activity of children on walks in the yard

Types of motor-playing activity	Rank	Sum of ranks
Travel by bicycle and scooter	1	315
Ball games	2	211
Games with playground equipment (slides, swings, ladders)	3	94
Outdoor games	4	48
Story, creative games for children (quest)	5	14

ern studies. The results of these studies are consistent with our findings. In the works of Efimova E.A. the place of outdoor games in the life of modern children is determined [5].

Leisure and physical activity of children and adolescents, according to Leto I., Loginova S., is one of the factors of their well-being and health [10]. The positive impact of physical activity, in their opinion, is based on experiencing positive emotions and establishing relationships with other children.

Poulain T., Meigen C., Sobek C., Ober P., Igel U. et al. (2021) studied the structural changes in the leisure activities of children aged 1 to 10 years in connection with the quarantine associated with Covid-19. They revealed how home schooling and the lack of social contacts with peers affect the behavior of children [11].

Conclusions**.** The results of our research show that limited motor experience, the destruction of the play space of childhood, the disappearance of folk traditions in the organization of motor activity reduce the possibility of transferring spiritual values and attitudes, national experience in the organization of motor-play activity through time and space. Regulatory and normative functions of the collective playing space of the yard are lost. Children do not master the order and rules of social behavior, interpersonal relationships. And, as a result, there are problems of social development of the personality, psycho-emotional stress, maladaptation. These problems require additional research.

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Modern specificity of the organization of the educational process for applied physical culture in the university

UDC 796.011.3

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Abstract

Objective of the study was to consider the problematic aspects and ways to solve them in the organization of the educational process in the discipline "Applied Physical Education" (elective disciplines), the implementation of which is carried out in accordance with the requirements of the current federal state educational standards of higher education.

Methods and structure of the study. In the course of the study, an analysis and generalization of scientific and methodological literature on the research problem was car-ried out; generalization of pedagogical experience; the data of a sociological survey of students on self-study in applied physical culture of students of the 1st-3rd courses of all faculties and different specialties of P.G. Demidov Yaroslavl State University.

Results and conclusions. The author notes that the right of educational organiza-tions to make an independent decision on the implementation of physical culture and sports programs was the reason for the distribution of hours not for compulsory classes, but for independent work of the student. This leads to the fact that students do not study, and only a small percentage of them continue to regularly attend sports sections during their studies. As other problematic aspects, the author cites an inconvenient schedule of classes, the lack of logistical capabilities to create the required number of sections for sports. As conclusions, the author suggests ways to solve the problem of systematic physical activity by university students.

Keywords: *federal state standard of higher education, applied physical culture (elective disciplines), curricula, practical classes, students' health.*

Introduction. Reforms of higher education are associated to a large extent with the modernization of the system of physical culture, in general, undergoing changes in content, goals and objectives, in terms of volume and form of implementation, in terms of its place in the educational process.

The main goal of the discipline "Physical culture" is the formation of competencies in physical culture, aimed at developing the personality of student youth and the ability to use the means and methods of physical culture, sports and tourism to maintain and improve health, psychophysical training and self-preparation for the future life and professional activity.

Achieving this goal provides for a significant intensification of the educational process and the creation of the necessary conditions for the effective work of students. However, everyday intense mental work, even with its good organization, requires stu-dents to be in good health and normal physical development.

When compiling curricula and class schedules, in the discipline of an elective block of practical orientation, 328 academic hours are provided, which are mandatory for mastering, are not converted into credit units and are not included in the scope of the program [2].

Objective of the study was to consider the problematic aspects and ways to solve them in the organization of the educational process in the discipline "Applied Physical Education" (elective disciplines), the implementation of which is carried out in accordance

with the re-quirements of the current federal state educational standards of higher education.

Methods and structure of the study. In the course of the study, an analysis and generalization of scientific and methodological literature on the research problem was car-ried out; generalization of pedagogical experience; the data of a sociological survey of students on independent classes in applied physical culture of students of the 1st-3rd courses of all faculties and different specialties of P.G. Demidov Yaroslavl State Univer-sity; the number of students involved in the sports sections of the sports educational de-partment and the number of students who passed excellent control standards in the study groups, based on the work journals of the groups, in the discipline of physical culture (elective disciplines) at the Faculty of Biology and Ecology in the fall semester of 2022.

Results of the study and their discussion. Applied physical culture (elective disciplines) consists of two sections: practical and control.

The practical section consists of two subsections: methodological and practical, providing mastery of the methods and ways of physical culture and sports activities to achieve educational, professional and life goals of the individual; educational and training, contributing to the achievement of physical improvement, increasing functional and motor abilities, directed formation of qualities and personality traits.

The control section defines a differentiated and objective accounting of the process and results of the learning activities of students [6].

In recent years, educational organizations have been given the right to make an in-dependent decision on the implementation of physical culture and sports programs, which was the reason for the distribution of hours not so much for compulsory classes, but for independent work of the student, which is unacceptable, but formally permissible [2].

The specialists who have no relation and idea about the goals, tasks and content of disciplines in physical culture and do not take into account the opinion of physical education teachers and students decide and enter into the curricula of the distribution of hours. And some members of the administration in higher education institutions propose to remove control standards altogether, which adversely affects the attitude towards physical culture and physical fitness of students, especially in the current conditions of the country.

At present, at many faculties of the university, out of 328 obligatory academic hours under the program, 224 practical classes are obligatory within the schedule and 104 are independent work. Of the 224 hours of compulsory academic hours, in the 2nd and 3rd year in each semester, 32 hours are mandatory and 38 hours are independent, which negatively affected the preparation of the level of physical and functional development and the health of students.

The physical readiness of students, adjusted in the conditions of training with an increased academic load, is an important component of the quality of assimilation of the educational program, which helps to maintain the working capacity of the young organism, its proper level of health, mental well-being and the improvement of psychophysical abilities, qualities and personality traits.

Independent physical education classes are considered an obligatory component of the scientific organization of labor, which compensate for the lack of motor activity, con-tribute to the most effective recovery of the body after fatigue, increase physical and intel-lectual performance, and should be carried out under the guidance of a teacher or trainer of appropriate qualifications.

It would seem that the introduction of self-study as one of the forms of motor activity of physical culture among students will solve the problems of motor mode using an individual approach in solving the problems of physical education.

But long-term observations of the dynamics of physical fitness of students during the entire period of study at the university shows that self-study, the majority of students consider optional. Only a small percentage of students (3-5%) continue to regularly attend sports sections during their studies [6].

Expansion of the network of sections of health-improving, sports nature in the conditions of the university will not give the desired result in increasing the motor regimen for most of the students. As a rule, up to 15-20 students can attend one sports section, and classes are held only during extracurricular time [4]. In many universities it is not possible to create the required number of sections and invite specialists due to insufficient material and technical capabilities.

From a physiological point of view, holding practical classes once a week (insuffi-cient physical activity) and the adoption of control standards adversely affect the health of students (cardiovascular, nervous, im-

mune systems, musculoskeletal system, etc.) and is detrimental to the whole organism.

One of the important principles of physical education is the principle of systematic and regularity, i.e. building such a schedule of physical activity, which ensures their grad-ual accumulation, and for this, classes should be held at least 2 times a week for 2 hours. Since the control system is one of the most important factors stimulating students to regu-lar classes. [6].

The schedule of studies at the university, in terms of blended learning, is set up until late, and students do not have the opportunity to attend sports sections.

Analysis of the conducted sociological survey of students of 1-3 courses (988 stu-dents) of all faculties and different specialties of Yaroslavl State University showed:

- 86% of students have the desire and opportunity to study independently; students understand the importance of physical education. However, only 59% of them go in for sports on their own, 25% of them go to sports clubs.

The following classes are in priority: in fitness centers - 50.4%, in the sports section - 26.5%, in the park - 14.9%, nowhere - 8.2% [3].

Analysis of the results at the Faculty of Biology and Ecology revealed:

- 15.5% of students are engaged in sections;

- they pass the control standards with excellent marks - 2.5%, and in the previous semester - 3.5%;

- looking for any opportunity not to go to class (for example, a medical certificate - 0.02%, in the previous semester - 0.02%;

- 70% want to study within the schedule 2 times a week;

- 11.98% undecided.

Changes in the educational process affected the special medical group "B" and adaptive physical culture (letter dated May 30, 2012 N MD-583/19 of the Ministry of Education and Science of the Russian Federation "On methodological recommendations" Medical and pedagogical control over the organization of physical education classes -cultural culture of students with health problems") [5], namely, conducting classes for students of the special group "B" directly in educational institutions. And now there is a distribution in training groups of 30 or more people, without taking into account deviations from students due to health reasons, and teachers without special education conduct physical education classes.

Conclusions.

• For the qualitative implementation of the discipline "Applied physical culture (elec-tive disciplines), it is necessary to evenly distribute the study load over the semesters, i.e. Two times per week. The result of the classes is the assessment of the formed given competencies by means of the students' fulfillment of the standards developed by the Department of Physical Culture and Sports.

• Students with sports categories and a high level of sports training (students, university teams or sports sections) are assigned to the sports department. Classes should be conducted under the guidance of a teacher of the department or a certified full-time coach-teacher of a sports club in sports, taking into account the developed programs.

• Students are assigned to special groups taking into account deviations due to their health status. Classes should be conducted by teachers - graduates of the faculty of adaptive physical culture, since their professional training involves conducting clas-ses with people with disabilities and people with health problems.

• In the staff list of the Department of Physical Education of each educational institu-tion, provide for rates in the specialty "Adaptive Physical Culture". If necessary, give a referral for primary education from among the employees of the Department of Physical Education.

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Harmonization of legislation on sports training and education: features of the transition period

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Abstract

Objective of the study was to reveal the content and organization of the transition period in the implementation of legislation on the harmonization of sports training and education.

Results and conclusions. In the course of theoretical analysis, the author notes the positive aspects of harmonization of sports training and the educational sphere, associated with an increase in the level of control over the form, content and methodological support of additional educational programs in this field of activity, an increase in the level of social guarantees for coaches and other specialists who acquire a pedagogical status similar to that of personnel. educational organizations. As a problematic aspect of the implementation of federal law No. 127, the distribution of financial support between sports and educational departments is given, which can lead to the loss of independence of organizations in managing financial resources to fulfill their main goals.

The author concludes that the transitional period in the implementation of the new federal law on the harmonization of sports training and education makes it possible to adapt the management systems of educational and sports activities to the proposed changes in local regulations, additional educational programs for sports training, changing the legal status of the position "coach".

Keywords: *legal regulation, sports activities, educational activities, harmonization.*

Introduction. From January 2023, the Federal Law of April 30, 2021 No. 127 «On Amending the Federal Law «On Physical Culture and Sports in the Russian Federation» and the Federal Law «On Education in the Russian Federation» comes into force in Russia. The adopted normative document is aimed at harmonizing the legislation on physical culture and sports and the legislation on education in relation to sports training and at creating conditions for the comprehensive development of children, improving their sportsmanship in children's and youth sports organizations, regardless of their departmental affiliation.

Objective of the study was to reveal the content and organization of the transition period in the implementation of legislation on the harmonization of sports training and education.

Results of the study and their discussion. Federal Law No. 127 provides:

- referral of organizations implementing sports training programs to organizations of additional sports education;
- assignment of sports training programs to additional general educational programs in the field of physical culture and sports;
- empowering coaches implementing sports training programs with rights, obligations and social guarantees for teaching staff;
- empowering persons undergoing sports training in organizations implementing sports training programs with the rights, obligations and guarantees of students;
- providing professional educational organizations with the opportunity to implement sports training pro-

grams, regardless of the departmental affiliation of such organizations;

• harmonization of sports training programs with basic and additional general education programs in the field of physical culture and sports [2].

The proposed activities are aimed at developing exemplary additional educational programs in accordance with the requirements of federal standards for sports training.

To eliminate and prevent disagreements in understanding the essence of harmonization of the normative base of sports training, it is proposed to improve the conceptual apparatus used in the legislation of the Russian Federation, including the clarification of the concept of «children's and youth sports» and «sports training». The federal law provides that youth sports cover persons under the age of 18. It is established that sports training is an educational and training process carried out within the framework of educational or labor activity.

It is important to note that the Federal Law will not entail the transition of organizations providing sports training from the sports system to the education system. It will allow all organizations providing sports training for children and youth, regardless of departmental affiliation, to work according to uniform rules established by the legislation on education and physical culture and sports, while maintaining the leading role of the Russian Ministry of Sports in regulating the organization and implementation of sports training as an educational training process.

I would like to emphasize that the changes envisaged by the Federal Law will also allow coaches to receive social guarantees provided to teachers of additional education, but at the same time they do not cancel or reduce the already established incentive payments that coaches now receive.

The legislation on the harmonization of sports training and education includes a transitional period until the end of 2023, which is necessary for all organizations providing sports training to bring their local acts and charters in line with the requirements of Federal Law No. 127, to obtain a license for the right to conduct educational activities, developed additional programs for sports training, transferred persons studying under additional pre-professional programs in the field of physical culture and sports to training already at the appropriate stage of sports training under additional educational programs, as well as transferring persons working as a «coach», from their written consent to the positions of «trainer-teacher», «senior trainer-teacher», provided for by the nomenclature of positions of pedagogical workers of educational organizations.

I would like to note the positive aspects of the harmonization of legislation in the field of sports training and education, associated with an increase in the level of control over the form, content and methodological support of additional educational programs in these areas of activity. In addition, it can be expected that the level of social guarantees for trainers and other specialists will increase, who will acquire a pedagogical status similar to the staff of educational organizations.

At the same time, the problem of financing the proposed activities within the framework of federal law No. 127 raises discussion. In particular, financial support is distributed between sports and educational departments. Financing of sports training will be transferred to the section of financing education (general, secondary vocational, higher education, additional education), which may lead to the loss of independence of organizations in managing financial resources to fulfill their main goals.

Of course, any sports federation will face various problematic situations related to the effective implementation of federal law No. 127. Thus, the analysis of the legislative framework, conducted by Professor F.Kh. Zekrin, made it possible to identify the negative factors of the introduction of the new law into the system of sports training that arose after the approval of the new federal standard for «judo»:

• insufficient number of training hours per week for all years of each stage of sports training;

• different ages for enrolling students at the stage of initial training in the discipline «kata» and «classical» sports discipline;

• lack of specification of the concepts of «technical mastery» and «compulsory technical program»;

• the standards of general physical and technical training for enrollment and transfer to groups at the stages of sports training, presented in the current version of the Federal Standard of Sports Training for the sport «judo», do not assess the special physical fitness of athletes in judo [1].

Conclusions. The transitional period in the implementation of legislation on the harmonization of sports training and the field of education allows adapting the management systems of educational and sports activities to the proposed changes in lo-

cal regulations, additional educational programs for sports training, and changing the legal status of the position «coach».

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Differentiation of conditions for mobile games for children with different degrees of motor disorders

UDC 796

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Abstract

Objective of the study was to differentiate the conditions for conducting outdoor games in the process of adaptive physical education of children with cerebral palsy with varying degrees of motor impairment.

Methods and structure of the study. The pedagogical experiment was conducted at the Tchaikovsky State Academy of Physical Culture and Sports from September to December 2021. Extracurricular classes on adaptive physical education for children with cerebral palsy were organized. The main content of the classes was corrective outdoor games. The subjects were 16 children with cerebral palsy aged 3 to 12 years of varying severity.

Before the start of classes, the primary diagnosis of children was carried out according to the following scales: determination of global motor function disorders (GMFCS); dysfunction of the hands and manual skills MACS; impaired communication function (CFCS); definition of mobility of the child (FMS). According to the diagnostic results, all children were divided into 3 groups, depending on the severity of motor disorders.

Results of the study and their discussion. Based on the primary diagnosis, the conditions for conducting active game were selected, which were adapted depending on the severity of motor disorders in children. The following components were subjected to differentiation: initial position, type of movement in the game, dosage, and the role of the child in the game. During the experiment period, statistically significant changes occurred in children of the 3rd group in terms of: fine motor skills, coordination of movements, muscle spasticity.

Keywords: *cerebral palsy, adaptive physical education, outdoor games.*

Introduction. Currently, there is an increase in the number of children with the consequences of cerebral paralysis of various forms. Despite the different forms of cerebral palsy, the general of such children is a delay in motor and speech development, the originality of the psycho -emotional sphere. The adaptive physical education of children with cerebral palsy is aimed at the formation of the main types of movements, the development of physical and mental qualities, the correction of existing disorders, the prevention of concomitant diseases and secondary deviations [2]. Extracurricular forms of adaptive physical education have great potential for correcting motor disorders. A feature of extracurricular forms is that in one lesson children with different diagnoses, of different ages and varying degrees of motor and mental disorders can be present. Since the severity of motor disorders has a significant impact on the child's functionality, this must be taken into account when planning and conducting classes on adaptive physical education [1, 3]. In the classroom, children can be proposed to perform different role functions, various tasks, altered starting positions, exercises with a handicap depending on their functionality.

One of the effective means of adaptive physical education of children with cerebral palsy is outdoor games. Outdoor games are valuable in that they simultaneously affect both the physical and mental spheres of those involved, in games you can easily change the conditions for their conduct and adapt the rules to the functionality of any child [4, 5].

Objective of the study was to differentiate the conditions for conducting outdoor games in the process of adaptive physical education of children with cerebral palsy with varying degrees of motor impairment.

Methods and structure of the study. The pedagogical experiment was conducted at the Tchaikovsky State Academy of Physical Culture and Sports from September to December 2021. Extracurricular classes on adaptive physical education for children with cerebral palsy were organized. The main content of the classes was corrective outdoor games. The subjects were 16 children with cerebral palsy aged 3 to 12 years of varying severity.

To assess the impact of adaptive physical education classes based on the use of outdoor games, selected taking into account the severity of motor disorders in children with cerebral palsy, an expert assessment was carried out. The number of experts included: 3 candidates of pedagogical sciences, specialists in the field of adaptive physical culture and 2 teachers of adaptive physical culture working in a correctional school. The experts assessed the change in the functional state of the musculoskeletal system of children over the period of the experiment in terms of indicators: mobility (assessment of the ability to sit, stand, walk), development of fine motor skills, coordination of movements. The assessment was carried out on a five-point scale, where 5 points - independent performance of exercises without errors, 4 points - independent performance with minor errors, 3 points - performance of the exercise with help or independent performance with gross errors, 2 points - performance of the exercise with assistance with minor errors, 1 point - performing the exercise with the help of gross errors or the impossibility of performing. Muscle spasticity was also assessed on a five-point Ashworth scale. In the course of mathematical processing, the median (M) and median error (m) were calculated.

Results of the study and their discussion. Before the start of classes, the primary diagnosis of children was carried out according to the following scales: determination of global motor function disorders (GMFCS); dysfunction of the hands and manual skills MACS; impaired communication function (CFCS); definition of mobility of the child (FMS).

Changes in the indicators of the functional indicator of the musculoskeletal system in children with cerebral palsy during a pedagogical experiment

Indicators		Test groups		
		1st	2 nd	3 rd
Mobility: assessment of the ability to sit (points)	Before experiment M±m	2,1±0,16	2,1±0,22	4,1±0,12
	After the experiment M±m	2,4±0,23	4,1±0,21	4,9±0,2
	p	>0,05	>0,05	>0,05
Mobility: assessment of the ability to stand, points	Before experiment M±m	2,2±0,27	2,9±0,14	4,7±0,2
	After the experiment M±m	2,8±0,3	3,8±0,17	4,9±0,13
	p	>0,05	>0,05	>0,05
Mobility: assessment of the ability to walk (points)	Before experiment M±m	1,2±0,13	2,5±0,11	4,2±0,2
	After the experiment M±m	2,3±0,29	3,7±0,16	4,7±0,13
	p	>0,05	>0,05	>0,05
Fine motor skills, points	Before experiment M±m	2±0,15	3,2±0,1	3,3±0,43
	After the experiment M±m	3±0,15	3,7±0,12	4,5±0,23
	p	>0,05	>0,05	≤0,05
Coordination of movements, points	Before experiment M±m	1,1±0,13	2,8±0,14	3,1±0,12
	After the experiment M±m	2,6±0,19	3,6±0,15	4,6±0,23
	p	>0,05	>0,05	≤0,05
Muscle spasticity, points	Before experiment M±m	3,4±0,29	2,9±0,12	2,1±0,1
	After the experiment M±m	2±0,11	1,6±0,1	0,6±0,11
	p	>0,05	>0,05	≤0,05

According to the diagnostic results, all children were divided into 3 groups, depending on the severity of motor disorders. The first group included children with spastic tetraparesis. In children of this group, motor disorders are expressed to a large extent, walking is possible only with the help of additional devices, hand movements are limited. Communication functions are moderately developed. The second group included children with spastic diplegia. Children have movement disorders, but they are less pronounced than in the first group. Walk independently with little assistance at a slow pace. The manipulative function of the hands is preserved, but it is difficult to perform exercises on fine motor skills. Communication functions are moderately developed. The third group included children with hemiparesis and mild spastic diplegia. They had a good level of motor development, however, during playing activities, especially with the ball, there was a violation of motor dexterity, responsiveness, tempo and rhythm of movements. Communication functions are moderately developed, there was a violation of behavior, the use of non-verbal communication (gestures, facial expressions, screaming).

Based on the primary diagnosis, the conditions for conducting outdoor games were selected, which were adapted depending on the severity of motor disorders in children. The following components were subjected to differentiation: initial position, type of movement in the game, dosage, and the role of the child in the game. For the children of the 1st group, the main initial positions in the game were lying (on the back, on the stomach, on the side) and sitting; for children of the 2nd group, the initial positions are sitting and standing, if necessary with support; for children of group 3, the starting position is predominantly standing. In sedentary games for children of all groups, the initial sitting positions were used.

We also differentiated the types of movements of children during the game - for children of the 1st group, crawling, walking on all fours (with help), turns from a prone position were used; for children of the 2nd group, walking and running with support were used; for children of the 3rd group running. In addition, games were used in which children of all groups performed one type of movement, which is typical for children in group 1. During the games that were played in pairs (for example, if it was necessary to pass the ball between the players), the size of the playground and the distance between the players were reduced for the children of the 1st and 2nd groups.

The number of repetitions of exercises during the game for children of the 1st group was reduced (6-8 times), the pace of the exercises was used slowly, the task included high-quality performance of the exercises. For children of the 2nd and 3rd groups, the number of repetitions increased up to 10-12 times, the pace was medium and high (for the 3rd group). The children of the 1st group needed a longer rest between games, therefore, during intensive outdoor games with running and jumping, in order to give the children of the 1st group a rest, and the children of the 2nd and 3rd groups the necessary load, they were assigned the role of teacher assistant and judge.

The table shows the data of expert evaluation of indicators of the functional state of the musculoskeletal system in children with cerebral palsy.

An analysis of the results of the expert assessment showed (table) that statistically significant changes occurred in children of the 3rd group in terms of indicators: fine motor skills, coordination of movements, muscle spasticity. For other indicators in all groups, there is a slight improvement in the results, which, in our opinion, is associated with the severity of the main diagnosis, the complexity of correcting the functional state of the musculoskeletal system, and the short duration of the experiment.

Conclusions**.** In order for every child to be successful in the game, and for adaptive physical education classes to effectively solve all the main tasks, it is necessary to differentiate the conditions for conducting outdoor games. Differentiation of the conditions for conducting outdoor games had a positive effect on the indicators of mobility, range of motion in the joints, muscle spasticity and coordination of movements in children with cerebral palsy with varying degrees of motor impairment.

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