Theory & Practice of Physical Culture

№ 3 March 2025

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

The variability of the content analysis method in modern pedagogical research on physical culture and sports

To generalize and systematize the knowledge gained in the course of empirical research in the field of physical culture and sports, an effective tool, along with the theoretical generalization of the source base, is the content analysis of textual scientific information, which allows to identify and objectively assess the relevance of the subject of scientific papers, its compliance with social demand, as well as the novelty, theoretical and practical significance of the conducted research. research in the field of physical culture and sports.

The use of content analysis in combination with other methods of studying pedagogical problems of physical culture and sports provides the following opportunities:

• ***Determining the relevance of scientific issues for this field of research based on the most studied areas.*** With its help, it is possible to identify insufficiently studied areas that need further research, which allows you to avoid duplication of work and direct efforts to research new, promising scientific areas.

• ***Identification of changes.*** Analyzing the dynamics of scientific papers over a certain period of time allows us to assess how accents and priorities in the field of physical culture and sports are changing. For example, it is possible to trace how attitudes towards inclusive sports or the use of new technologies in the training process have changed.

• ***Systematization and generalization of knowledge.*** Content analysis makes it possible to classify various approaches, methods and tools used in pedagogical research on physical culture and sports, which makes it possible for researchers to set guidelines in choosing directions and selecting the most effective methods for achieving goals and solving problems.

• ***Identification of common patterns.*** The analysis of a large number of studies makes it possible to identify common patterns and principles that form the basis for successful pedagogical activity in the field of physical culture and sports.

• ***Evaluation of the quality of research.*** Content analysis combined with SWOT diagnostics makes it possible to assess the quality of research, identify its strengths and weaknesses, and identify the opportunities and risks of implementing scientific results. The use of these techniques by experts makes it possible to avoid subjective assessments of the scientific work carried out.

• ***Development of new pedagogical concepts.*** The results of the content analysis can be used in the development of educational programs and methodological recommendations that take into account current trends and needs in the field of physical culture and sports, which will form the basis of new pedagogical concepts.

Today, content analysis, thanks to the variable capabilities of its toolkit, is becoming an interdisciplinary method that is successfully applied in various scientific areas of sports pedagogy. Along with this, it should be noted the integration capabilities of this method, manifested in combination with other research procedures that allow to obtain a comprehensive and contextual understanding of the studied pedagogical phenomenon or object, as well as generate new holistic knowledge both in the field of pedagogy and in the field of physical culture and sports.

We invite scientists to publish the results of scientific research aimed at finding and studying the value meanings of physical culture and sports.

Editor-in-Chief of TPPC, Honored Worker of Physical Culture of the Russian Federation
Dr. Hab., Professor L.I. Lubysheva

Theory and Practice of Physical Culture

3'2025

Monthly Scientific-theoretical Journal, founded in 2013

ISSN 2409-4234

©ANO SPC «Theory and Practice of Physical Culture and Sport»

105122 Moscow,
Sirenevy blvd, 4.
e-mail: fizkult@teoriya.ru

http://www.tpfk.ru

Theory and Practice of Physical Culture

Contents

A novel strategy for assembling youth national teams

UDC 796.966

PhD **E.S. Naboychenko**[2]
S.O. Istomin[1, 2]
A.N. Ezhov[1, 2]
S.V. Kondratovich[1, 2]
[1]Sports school of the Olympic Reserve «Spartakovets Hockey Academy», Yekaterinburg
[2]Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: s.o.istomin@urfu.ru

Received by the editorial office on 20.01.2025

Abstract

Objective of the study was to create a groundbreaking method for selecting national youth teams.

Methods and structure of the study. A group of 52 young athletes, aged 16, from hockey schools in the Ural Federal District, took part in the assessment. They had been playing hockey for 11 to 12 years. The assessment was conducted between July 2024 and December 2025.

Results and conclusions. The advanced methodology for assembling youth hockey teams emphasizes the importance of considering the fundamental aspects of a player's abilities and their psychological and physical condition. The novel approach to team building incorporates a systematic process that combines modern techniques for sports selection and monitoring the psychological and physical state of athletes, utilizing observation and gradual evaluation of their performance in competitive events. This approach also considers the necessary and sufficient indicators of an athlete's psychological and physical condition, as well as their individual and potential capabilities. By analyzing the promising attributes of an athlete, we can determine whether they meet the selection criteria for the national team.

Keywords: *athlete, hockey, selection system, individual profile, functional state.*

Introduction. Modern trends in the development of science, the possibilities of new technologies, the level of world sports dictate the need to improve the systems and technologies for staffing national youth teams. The problem of the topic under consideration is to improve the selection system for staffing national teams in order to achieve high sports results. Based on the fact that the development of new trends in any field of knowledge dictates the processing of accumulated scientific and practical information every 5-10 years, it seems relevant to consider the stated topic in a new aspect. A. Yu. Bukatin in his research pays special attention to selection and defines it as a set of organizational and methodological measures aimed at choosing from a group of candidates those persons from whom high and stable achievements in future gaming activities can be expected with the greatest probability.

Objective of the study was to create a groundbreaking method for selecting national youth teams.

Methods and structure of the study. A team of 16-year-old athletes (n=52) participated in the testing. They represented hockey schools of the Ural Federal District. Their hockey experience was 11-12 years. Test samples were conducted from July 2024 to December 2025. The recruitment criteria were determined by the specifics of the activities being implemented and consisted of a comprehensive assessment of the competitive activities and functional diagnostics of the athletes. Diagnostic equipment: Wattbike exercise bike; NS-Psycho Test computer complex (Neuro Soft, Russia); Simona 111 integrated cardiac monitoring system (Medtekhnika, Russia), Co-Reaction neuromuscular warm-up system (Russia, Taiwan), TensoJump 4000 tensoplatform (Marathon-Electro, Russia), Svetofon hardware and software (Svetofon, Russia).

Results of the study and discussion. Successful implementation in hockey predetermines special conditions for the morphofunctional characteristics, psychophysiological features, physiological performance of the athlete and gives rise to a number of questions:

• To whom and on the basis of what criteria should preference be given at a similar level of training?

• What is the compatibility of future members of the national team?

• How to organize objective control of the functional state of the athlete with the least time expenditures?

The developed technology does not contain contradictions with the proposed selection methods, but is more specific, taking into account the stability of the individual-typological characteristics of the athlete, and includes:

1. Determination of objective selection criteria capable of predicting the success of the candidate in the upcoming competitions.

2. Conducting stage control in order to determine the stability of the results.

3. Analysis of individual profiles of athletes using their visualization and determining the compatibility of team members.

4. Correlation of the assessment of competitive activity and functional readiness.

Based on the work performed, the following selection criteria were identified:

1. Evaluation of the sports component:

– observation of competitive activity in the current sports season; observation of training activities during training camps; effectiveness of participation in competitions and test matches (video analysis).

2. Evaluation of the functional state of athletes:

– assessment of speed-strength and coordination abilities: Wingate test, Visual-motor coordination (Wattbike, Co-Reaction); determination of individual characteristics of athletes and psychofunctional state: PZMR, SZMR, RDO (NS-Psychotest); diagnostics of the functional readiness of the cardiovascular system (adaptation reserve) integral balance, adaptation reserve (Simona 111).

In order to assess the sports component, a comprehensive approach was used, including independent expert and coaching assessments using an identical methodology with a description of the necessary indicators depending on the athlete's role, on a scale from 0 to 10 points.

In addition to expert and coaching assessments, a statistical analysis of competitive activity was conducted using scales from 0 to 10 points developed by us.

All of the above-described methods for assessing players are combined into a formula reflecting a summary assessment of a hockey player in all positions:

Σ=0,3 EA + 0,3 CA +0,4 ACS,

where: EA – expert assessment; CA – coaching assessment; ACS – assessment of competition statistics.

The significance coefficients were proposed by us based on practical experience and are experimental, currently being tested.

The next stage of the work was the formation of an individual hockey player profile based on the assessment of the functional state of athletes.

Modeling an individual athlete profile and assessing the compatibility of profiles: the results of numerous studies of athletes prove that the obtained parameters do not always correlate with each other and the same athlete may have different levels for different indicators. To obtain a more accurate representation of the current status of an athlete, it is recommended to create an individual profile, by which we mean the optimal combination of the necessary functional characteristics of an athlete that are significant in the sport being implemented.

The figures show visualized profiles in accordance with the selected criteria (Figure 1).

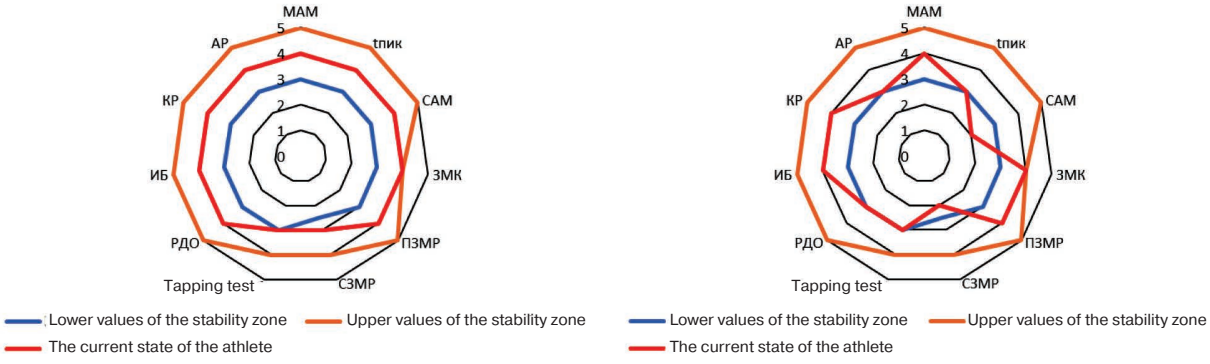


Figure 1. Examples of individual athlete profiles

The upper limit reflects the athlete's potential and his or her ultimate capabilities. The lower limit of the zone shows the level of reliability, i.e. the minimum results that he or she is capable of demonstrating even in the most unfavorable circumstances. If the lower limit is higher than the current one, this indicates a deviation in the functional state and requires more in-depth diagnostics. The width of this zone reflects the level of stability of the results.

It was also noted during the observation process that such profiles can be useful when deciding on the compatibility of candidates in game links. Thus, in the event of injuries, the inability to continue playing in unforeseen cases, or the disqualification of an athlete, a rotation of athletes with similar profiles can be performed.

The main idea during the period of staffing the national team is to monitor the current state of the athlete at different stages of preparation for the competition and assess the success of his or her competitive activity on a ten-point scale. In each period, a correlation is determined between his or her current functional state (individual athlete profiles) and success in the activity being implemented (trend lines). Visualization of the current state of the athlete and success in competitive activity at different stages of preparation for the main competitions is presented in Figure 2.

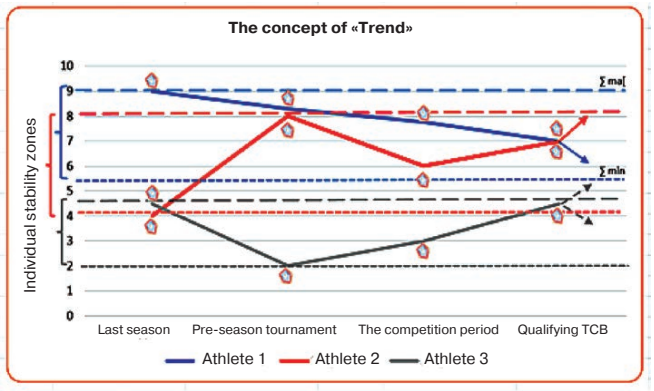


Figure 2. Visualization of the current state of the athlete and success in competitive activities at different stages of preparation for the main competitions

The technology of the solved problem of staffing the national team looks like this:

1) if the athlete's indicators tend to decrease over several stages of preparation, then preference will be given to the candidate: demonstrating an upward trend; having the highest potential in competitive activity; having the smallest range of the stability zone;

2) in parallel, the problem of determining the individual profile of athletes is solved, with which the team can show the highest sports result;

3) formation of an individual profile of a hockey player corresponding to his highest level of competitive activity (peak of sports form) by adjusting the training process, medical-biological and psychological support during the training camp.

Conclusions. The developed technology for staffing youth hockey teams should be based on the main criteria of a hockey player's skill and his psychofunctional state. The innovative approach to staffing national teams includes an algorithm of modern methods of sports selection and monitoring of the athlete's psychofunctional state based on observation and stage-by-stage control of the effectiveness of participation in competitive activities; necessary and sufficient indicators of the athlete's psychofunctional state, his individual and potential capabilities; analysis of the athlete's promising characteristics allowing to draw a conclusion about the applicant's compliance with the criteria for selection to the national team.

Monitoring the individual profile of a hockey player during periods of sports training allows to determine the relationship between his effectiveness in competitive activities and his functional state, to predict the trend of his sports activities, as well as to adjust and manage his individual trajectory. The integral indicator for assessing competitive activities is a summary assessment expressed in a formula reflecting the expert, coaching and statistical indicator for all positions. The result of this work is the ability to conduct a correlation between the change in individual functional indicators of a hockey player and the sports result, which, ultimately, will allow us to form a trend and predict the success of athletes' performance in upcoming competitions, as part of the selection and preparation of athletes for national teams.

References

1. Bukatin A.Yu. Kontrol za podgotovlennost'yu khokkeistov razlichnykh vozrastnykh grupp (vklyuchaya otbor). Moscow: Federatsiya khokkeya Rossii, 1997 24 p.
2. Bulkin V.A. Otbor i podgotovka kvalifitsirovannykh sportsmenov k otvetstvennym sorevnovaniyam. Collection of scientific papers. V.A. Bulkin, YA. Kiselev [ed.]. Leningradskiy nauchno-issledovatelskiy institut fizicheskoy kultury.

3. Volkov V.M., Filin V.P. Sportivnyy otbor. Moscow: Fizkultura i sport publ., 1983. 176 p.
4. Ilyin E.P. Differentsialnaya psikhofiziologiya. 2nd ed., sup. St. Petersburg: Piter publ., 2001. 454 p.
5. Kondratovich S.V., Novakovskiy S.V., Kachalov D.V. Monitoring psikhologicheskogo sostoyaniya sportsmenov-khokkeistov v predsorevnovatelnyy period. Teoriya i praktika fizicheskoy kultury. 2022. No. 11. pp. 10-11.
6. Kuramshin Yu.F., Mikhno L.V. Teoriya i metodika izbrannogovida sporta (khokkey): «otbor v khokkeye». Study guide. St. Petersburg: Akademiya khokkeya publ., 2013. 173 p.
7. Runenko S.D., Talambum E.A., Achkasov E.M. Issledovaniye i otsenka funktsionalnogo sostoyaniya sportsmenov. Study guide. Moscow: Profil publ., 2010. 172 p.
8. Savin V.P. Teoriya i metodika khokkeya. textbook for students of higher educational institutions. Moscow: «Akademiya» publ., 2003. 400 p.
9. Morgan W.P., Brown D.R., Raglin J.S. et al. Phichological monitoring of overtraining and staleness. Br. J. S. Sports Med. 1987. No. 21. pp. 107-140.
10. Tenenbaum G., Jones C.M., Kitsantas A. et al. Failure adaptation: an investigation of the stress response process in sport. J. Sports Psechol. 2003. No. 34. pp. 27-62.

The impact of a particular warm-up on the demonstration of a badminton player's reactive agility in game scenarios

UDC 796.344

Dr. Hab., Professor **O.E. Ponimasov**[1,2]
[1]The Russian Presidential Academy of National Economy and Public Administration, North-Western Institute of Management, St. Petersburg
[2]The Herzen State Pedagogical University of Russia, St. Petersburg

Corresponding author: o-pony@mail.ru

Received by the editorial office on 06.02.2025

Abstract

Objective of the study was to experimental validation of the efficacy of specific warm-up drills in enhancing the player's reactive agility in tactical badminton scenarios.

Methods and structure of the study. The study included 25 experienced male badminton players aged 20,3±1,6 years. They underwent a modified agility test twice – once without and once after a specific dynamic warm-up. The study measured the time it took for the players to respond to a visual signal.

Results and conclusions. Following a preliminary specialized warm-up, all participants demonstrated improved reaction times. The mobilization stimuli provided by a series of specialized warm-up exercises, specifically designed to prepare for reactive coordination tasks, enhance the speed of motor response and the successful execution of coordination skills in badminton players.

Keywords: *badminton, positional readiness, reactive agility, dynamic warm-up, tactical situations of badminton.*

Introduction. Badminton places high demands on neuromuscular coordination of movements and requires rapid motor reactions of players to unpredictable game situations. With the initial flight speed reaching 300 km/h, players have only a split second to assess the direction, trajectory angle, speed, negative acceleration of the shuttlecock and perform a controlled hit to the required point of the opponent's court. A successful combination begins with the player's positional readiness [2]. Positional readiness is a multi-component quality expressed in the badminton player's ability to occupy an advantageous position, ensuring the possibility of performing accurate hits at a high speed of movement and tempo of the game. A badminton player who spends most of the game time in an advantageous position, all other things being equal, has the highest chance of winning the match. The qualities that ensure the positional readiness of a badminton player are an instant assessment of the game situation, speed of motor reaction, and high-speed coordination [3]. The specificity of agility in badminton is manifested in rapid movement in response to a game stimulus with a change in speed or direction of movement in order to take an advantageous position for further game actions. As a rule, the motor basis for the implementation of reactive abilities in badminton is a lateral lunge of the leg in one direction or another in the form of a «one step» reaction, which requires high elasticity of the structural components of muscle-ligament tissues and mobility in the joints [1].

It has been established that for the performance of athletes in sports that require a high level of agility development, dynamic stretching of ligaments and muscles during the warm-up is most effective. Compared with the use of only passive stretching, dynamic warm-up significantly improves the indicators of special agility and has a positive effect on the reaction time of «one step» [4].

The relevance of developing positional readiness skills based on coordination and reactive abilities radically changes the approach to building a specialized

dynamic warm-up for a badminton player before the start of a competitive match.

Objective of the study was to experimental validation of the efficacy of specific warm-up drills in enhancing the player's reactive agility in tactical badminton scenarios.

Methods and structure of the study. The study involved 25 qualified male badminton players aged 20,3±1,6 years. The badminton players performed a modified reactive agility test twice – without and after a specialized dynamic warm-up.

A general five-minute warm-up included exercises for static and dynamic stretching of ligaments and muscles. After a general warm-up, the badminton player performed a set of special game exercises for 15 minutes with a gradual increase in the complexity of their performance during counter-hits from the right and left.

The test for coordination and reactive abilities included 16 pulses of a visual light signal (4 in each direction) with random generation of their localization and a fixed generation time of 2000 m/s. The test result was counted as the average reaction time in each of the four directions from the moment the signal passed until the touch of the mats with a limb, the upper mats with a hand, and the lower ones with a foot.

The subjects began the test standing in the middle of the court. The task was to touch one of four target mats as quickly as possible, two of which were located on the court in the right and left service zones at a distance of 2 m from the center line each, and the other two were in a vertical position on the racks at a distance of 4 m from each other symmetrically from the center line. The mats were touched with a racket or a foot in accordance with the passage of a visual light signal appearing in one of the corners of the screen. The location of the mats corresponded to the specific tasks of badminton.

Testing was carried out in the middle of the playing season.

Reaction time in tests to determine the time of a simple motor reaction was measured using the Reaction Time Test (RTT) computer program [5].

The obtained data were statistically processed using basic descriptive statistics and a test for normal distribution. The data obtained with and without the use of a set of special warm-up exercises (motor reaction time of the legs, arms and total reaction time) were compared based on the t-criterion. Statistical calculations were performed using Statistica 12 statistical software. Statistical significance was set at $p<0,05$.

Results of the study and discussion. The results of the modified sensorimotor response test to a light signal are presented in the table.

The average reaction time of players' movement without specialized warm-up was 276,4±64,9 m/s; with preliminary specialized warm-up – 242,8±97,7 m/s, a reliable improvement of 33,6 m/s (12,2%) was noted. The average reaction time of «one step» in directions involving the use of upper limbs, without specialized warm-up was 305,4±51,4 m/s, with specialized warm-up – 261,1±43,6 m/s, a reliable improvement of 44,3 m/s (14,5%) was observed. The average reaction time of movement in directions using the lower limbs without specialized warm-up was 261,2±38,6 m/s, after specialized warm-up – 225,7 ± 38,7 m/s with an improvement of 35,5 m/s (13,6%).

All subjects improved their reaction time after preliminary specialized warm-up.

Being essentially a situational sport, badminton allows for systematic management of resonances of adaptation to speed-reactive loads at the upper limits of the sensory-motor sphere of badminton players. The linearity of determinations between tactical positional readiness and high sports results is ensured by the high speed of the player's motor reaction.

Indicators of the time of the player's sensorimotor reaction to a light signal, m/s

Localization of visual signal	Without warming up	With a warm-up	t
Top left	313,5 ± 82,7	273,6 ± 36,5	6,8
Top right	297,3 ± 79,5	248,5 ± 68,2	4,2
Average reaction time to the signal of the upper localization	305,4 ± 51,4	261,1 ± 43,6	3,7
Bottom left	259,1 ± 34,7	231,9 ± 77,3	2,9
Bottom right	263,2 ± 65,9	219,5 ± 56,8	5,2
Average reaction time to the signal of the lower localization	261,2 ± 38,6	225,7 ± 38,7	3,1
Average total time	276,4 ± 64,9	242,8 ± 97,7	2,8

Additional opportunities for activating components of reactive agility are provided by using preliminary special warm-up immediately before participation in competitions. The study showed a general statistically significant improvement in the sensory-motor reaction time indicators at a level of almost 12%, which ensures the achievement of peak values of reactive agility in badminton game situations. The phenomenal nature of phase transitions to the state of optimal positional readiness of a player when using a set of special warm-up exercises indicates the resonant nature of the morphofunctional training of the athletes' body in reactive-coordination work. Statistically significant differences between the reaction time using the upper and lower extremities were not established. In this regard, it can be stated that the impact of a special warm-up on achieving an urgent effect in improving the neurophysiological state of badminton players is complex.

Conclusions. Mobilization stimuli of the complex of special warm-up exercises, maximally focused on preparation for specific reactive-coordination work, ensure the speed of motor reaction and successful implementation of badminton players' coordination abilities.

The effectiveness of special motor warm-up is due to the activation of the sensory-motor systems of the athletes' body, achieved through the use of exercises corresponding to the specific tasks of badminton.

The representativeness of positive settings of the sensory-motor sphere of badminton players is expressed in the achievement of high indicators of coordination-reactive abilities, the growth of the implementation efficiency of the game technique and the performance of game techniques and actions in the conditions of tactical situations of badminton.

References

1. Barchukova G.V., Brusovankin V.S., Migalina T.M. Primeneniye trenazhera dlya sovershenstvovaniya igrovykh peremeshcheniy badmintonista. Teoriya i praktika fizicheskoy kultury. 2019. No. 10. pp. 29.
2. Vinogradova O.P., Morozova L.V., Melnikova T.I., Ponimasov O.E. Korrektsiya polozheniya tulovishcha legkoatletok-sprinterov na osnove izmeneniya posturalnogo balansa. Teoriya i praktika fizicheskoy kultury. 2024. No. 1. pp. 31-33.
3. Migalina T.M., Barchukova G.V., Brusovankin V.S. Analiz effektivnosti sovershenstvovaniya tekhnicheskoy podgotovki yunykh badmintonistov s pomoshchyu trenazhera dlya igrovykh peremeshcheniy. Teoriya i praktika fizicheskoy kultury. 2021. No. 10. pp. 100-103.
4. Mikhailov K.K., Ponimasov O.E., Titarenko Yu.A. Proyavleniye dykhatelnykh funktsiy khokkeistov pri trenirovochnykh vozdeystviyakh razlichnoy napravlennosti. Teoriya i praktika fizicheskoy kultury. 2023. No. 3. pp. 9-11.
5. Nemtsev O.B., Gogodze B.M., Bguashev A.B. et al. Kompyuternaya programma dlya opredeleniya vremeni prostoy motornoy reaktsii i reaktsii vybora. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2017. No. 10 (152). pp. 321-326.

Characteristics of physical progression in martial arts

UDC 796.41

Dr. Biol., Professor **M.G. Tkachuk**[1]
Dr. Hab., Professor **A.G. Levitskiy**[1]
Dr. Hab., Professor **G.V. Rudenko**[2]
Dr. Hab., Associate Professor **A.M. Simakov**[2]
[1]Lesgaft National State University of Physical Education, Sport and Health, St. Petersburg
[2]Saint-Petersburg Mining University of Empress Catherine II, St. Petersburg

Corresponding author: al.judo@yandex.ru

Received by the editorial office on 04.01.2025

Abstract

Objective of the study was to contrast the physical growth metrics of athletes who practice judo and taekwondo.

Methods and structure of the study. Fifty-seven young men, aged between 17 and 21, who specialize in judo and taekwondo, and who have achieved the first-adult category in their respective sports, were examined. All participants underwent necessary anthropometric measurements. The somatotype was assessed using the Hit-Carter method. The athletes' respiratory function was evaluated through spirometry, and their hand grip strength was measured using dynamometry. The index method was employed to evaluate their physical development.

Results and conclusions. Judoists in the middle weight categories, aged 17 to 21, tend to have a well-proportioned physique, while taekwondo athletes often have a more athletic build. Additionally, judoists tend to have a higher percentage of muscle mass compared to taekwondo athletes. The physical characteristics of martial artists are more influenced by their body type than by their specific sport.

There were notable differences in the vitality index between athletes with balanced mesomorphic and endomorphic body types, as well as between athletes with balanced mesomorphic and ectomorphic body types. Similarly, there were differences in the body mass index between athletes with ectomorphic and endomorphic body types. Furthermore, there were variations in the proportionality of development between athletes with balanced mesomorphic and ectomorphic body types, as well as between athletes with ectomorphic and endomorphic body types.

Keywords: *anthropometry, somatotype, physical development, boys, judo, taekwondo.*

Introduction. The high level of sports achievements in martial arts indicates the need for a comprehensive study of their individual typological characteristics at all stages of sports training [3, 6]. Of particular importance in solving strategic problems of choosing a sports specialization in martial arts and predicting the future prospects of athletes is the assessment of their somatotype [1]. Identifying indicators of physical development of athletes involved in various types of martial arts expands the understanding of the patterns of adaptation of the body to extreme environmental influences, including intensive training loads [2, 4, 5].

Objective of the study was to contrast the physical growth metrics of athletes who practice judo and taekwondo.

Methods and structure of the study. The study involved 28 judoists and 29 taekwondoists, middle weight categories, aged 17-21 years, with the sports qualification of the 1st adult category – Master of Sports. All athletes underwent the necessary anthropometric measurements. The somatotype was assessed using the Heath-Carter method [7]. External respiration was studied using the spirometry method, the strength of the flexor muscles of the hand – using the dynamometry method. To determine physical development, the index method was used: the Yarkho-Kaupe weight-height index, the Erisman index and the Levee index for chest and height, the proportionality index, the strength and vitality indices.

Results of the study and discussion. The anthropometric indices of martial artists show that with the same average body weight, taekwondoists are taller, have a longer torso and lower limbs, compared to judoists. Judoists, in turn, have significantly larger chest circumference and shoulder width values and significantly smaller pelvis width values, compared to taekwondoists ($p<0,05$). Analysis of the component composition of body weight in martial artists revealed that judoists have a higher relative muscle mass of the body than taekwondoists. No significant differences in the relative content of bone and fat mass of the body in the groups of martial artists were found (Table 1).

In the process of determining the somatotype of martial arts athletes, it turned out that they have three body types: ecto-mesomorphic, balanced mesomorphic and endo-mesomorphic. In judokas, the predominant morphotype is balanced mesomorphic, and in taekwondo athletes, ecto-mesomorphic. Thus, among judokas, the balanced mesomorphic body type is found in 46% of athletes, ecto-mesomorphic – in 25% and endo-mesomorphic – in 29%. Among taekwondo athletes, the balanced mesomorphic somatotype was found in 36% of athletes, ecto-mesomorphic – in 39% and endo-mesomorphic – in 25%. When studying the external respiration parameters in martial artists, significantly higher values of VC and chest excursion were found in judoists ($p<0,05$). Thus, in judo representatives, the average VC values were 4300+18,9 ml and chest excursion – 6,8+0,8, and in taekwondo athletes, respectively, 4100+17,8 ml and 5,8+0,6. No reliable differences were found in the dynamometry results in martial artists. In judo athletes, the average values of the strength of the flexor muscles of the right hand were 49,5+3,6 kg, and in taekwondo athletes – 60,3+4,2 kg.

A study of the level of physical development in representatives of various types of martial arts revealed the following. Judokas have significantly lower values of the weight-height index and the proportionality index, compared to taekwondo athletes ($p<0,05$), which indicates a lower location of the general center of gravity in judokas and, accordingly, greater body stability (Table 2).

We also found statistically significant differences in the values of physical development indices in athletes depending on their somatotype. For example, the value of the Yarkho-Kaupe weight-height index in athletes with a balanced mesomorphic body type averaged 405,2+9,8 g/cm, in endo-mesomorphic – 410,8+8,3 g/cm, and in ecto-mesomorphic – 390,4+10,2 g/cm. The Erisman chest-height index in martial artists with a balanced mesomorphic somatotype was equal to 6,2+0,2 c.u., in endo-mesomorphic – 6,4+0,3 c.u., and in ecto-mesomorphic – 5,7+0,2 c.u. The value of the vital index in individuals with a balanced mesomorphic body type averaged 68,5+1,8 ml/kg, in endo-mesomorphic – 63,8+2,3 ml/kg and in ecto-mesomorphic – 61,7+2,2 ml/kg. The typological series of decreasing indicators of weight-height and chest-height indices can be traced in the following sequence: endo-mesomorphic somatotype, balanced mesomorphic and ecto-mesomorphic, and the typological series of decreasing indicators of vital and strength indices: balanced mesomorphic, endo-mesomorphic and ecto-mesomorphic morphotype.

Conclusions. Judokas of the middle weight categories, aged 17-21, have a balanced mesomorphic

Table 1. Morphological indicators of athletes engaged in various types of martial arts (M+m)

Morphological indicator	Type of martial art	
	Judo (n=28)	Taekwondo (n=29)
Body length, cm	172,0+3,6	175,6+3,8*
Torso length, cm	55,1+2,3	57,6+1,8 *
Upper limb length, cm	75,1+1,5	74,8+1,4
Lower limb length, cm	91,5+2,7	93,7+1,8 *
Chest circumference, cm	92,1+1,1	90,6+1,0*
Shoulder width, cm	41,2+2,3	39,6+1,1*
Pelvis width, cm	24,9+1,5	26,7+1,2*
Fat mass, %	7,5+0,5	7,1+0,7
Muscle mass, %	52,5+3,1	50,8+2,8*
Bone mass, %	20,4+1,2	19,3+1,6

*Note: n – sample size; * – differences between are significant at $p<0,05$.*

Table 2. Comparative analysis of physical development indicators in athletes engaged in various types of martial arts (M+m)

Physical development indicators	Type of martial art	
	Judo (n=28)	Judo (n=28)
Weight-height index, g/cm	402,5+8,7	390,3+11,2*
Vital index, ml/kg	60,5+1,9	58,9+2,1
Proportionality index, %	67,3+3,2	73,9+3,6*
Leavy chest-height index, %	51,3+4,1	50,2+2,8
Erisman chest-height index, c.u.	6,2+0,2	5,8+0,4*
Strength index, %	69,2+3,9	67,9+4,2

*Note: n – sample size; * – differences between judokas and taekwondokas are significant at p<0,05.*

body type, while taekwondo athletes have an ecto-mesomorphic body type. The physical development indicators of martial artists depend to a greater extent on the body type than on the sports specialization.

References

1. Antonov S.G. Formirovaniye vybora sportivnoy spetsializatsii v yedinoborstvakh. Monograph. SPbGAFK im. P.F. Lesgafta publ., St. Petersburg, 1997. 147 p.
2. Afanasyeva I.A. Geneticheskiye osobennosti treniruyemosti tkhekvondistov i ikh sportivnyy otbor. Monograph. SPbGAFK im. P.F. Lesgafta publ., St. Petersburg, 2004. 96 p.
3. Kuvanov V.A. Zaytsev A.V., Ilyushchenko S.A., Murasheva M.V. Otsenka fizicheskoy podgotovlennosti kvalifitsirovannykh bortsov-yuniorov volnogo stilya kak sredstvo effektivnogo upravleniya uchebno-trenirovochnym protsessom. Teoriya i praktika fizicheskoy kultury. 2024. No. 4. pp. 21-23.
4. Rudenko G.V., Tkachuk M.G., Dorofeyev V.A. Morfologicheskiye pokazateli uspeshnosti sorevnovatelnoy deyatelnosti v yedinoborstvakh. Teoriya i praktika fizicheskoy kultury. 2020. No. 4. pp. 92-94.
5. Sologub E.B., Taymazov V.A., Afanasyeva I.A. Sportivnaya genetika. St. Petersburg: Politekhnicheskogo universiteta publ., 2017. 166 p.
6. Tkachuk M.G. Levitskiy A.G., Sobolev A.A. Individualno-tipologicheskiye osobennosti bortsov s razlichnoy treniruyemostyu. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2018. No. 3. pp. 288-292.
7. Carter J. The Heath-Carter anthropometric somatotype. Canada. 2002. 22 p.

Comparative analysis of the performance of olympic games-2024 finalists in wrestling

UDC 796.81.

Dr. Hab., Professor **S.V. Latyshev**
Don State Technical University, Rostov-on-Don

Corresponding author: slatyshev1975@gmail.com

Received by the editorial office on 25.11.2024

Abstract

Objective of the study was to perform a comparative study of the performance traits of male and female wrestlers in the disciplines of freestyle and Greco-Roman wrestling at the Olympic Games in Paris in 2024.

Methods and structure of the study. The following approaches were employed in the research: a review of scholarly and methodological publications, video analysis, and timing of the competitive matches for the first and third places in each weight class at the Paris 2024 Olympic Games in wrestling for both men and women (freestyle and Greco-Roman wrestling), as well as the application of mathematical statistical techniques.

Results and conclusions. The following aspects of the competitive performance of wrestlers were calculated: the average duration of a bout, the average time spent wrestling in the standing and clinch positions separately, the intensity and consistency of wrestling in the standing position, the overall effectiveness of the bout, and the effectiveness of wrestling in the standing and clinch positions separately, as well as the number of high-scoring bouts.

Subsequently, a comparative analysis of these aspects was conducted based on gender and wrestling discipline. The analysis revealed that the key indicators of entertainment and success in a wrestling match, such as activity, effectiveness, and high-scoring, were highest for male wrestlers specializing in freestyle and lowest for Greco-Roman wrestlers. The disparities in these indicators were substantial, varying from 1,29 to 2,52 times.

The efficacy of grappling on the ground is significantly higher for men in two categories, with a ratio of more than two to one, and for women, it is 1,27 times more effective. This necessitates a substantial overhaul of the training regimen for athletes, with a focus on enhancing their technical and tactical abilities in the clinch, particularly for men.

Keywords: *Olympic Games, wrestling, freestyle wrestling, Greco-Roman wrestling, competitive activity.*

Introduction. Competitive activity (CA) of highly skilled athletes is constantly transforming, which is associated with changes in competition rules, evolution of the sport and other factors. This requires constant updating of effective CA models by identifying the most significant characteristics of competitive activity for a given sport, which are relatively independent in nature [5]. In martial arts, the first studies on the issues of identifying and analyzing the informative characteristics of competitive activity began more than 40 years ago [1, 6]. Currently, scientists identify a large number of CA characteristics depending on the objectives of the study, while the approach in which the choice of characteristics is determined by the success and spectacle of the competitive fight seems preferable. Based on this, we will highlight the following quantitative characteristics: activity - the number of real attacks (assessed and unassessed) carried out by an athlete per unit of time; effectiveness - the number of points won by an athlete per unit of time; attack reliability – the ratio of the number of assessed technical and tactical actions (TTA) to the total number of real attacks; reliability of defense – the ratio of the number of successfully repelled attacks to the total number of attacks by the opponent; high-scoring – the share of high-scoring attacks in the total number of assessed TTA [2, 3, 4].

Current models of competitive activity, the achievement of which is associated with the athlete's reaching the level of a given sports result, are the system-forming factor that determines the structure and content of the training process at this stage of sports improvement [4, 5]. Thus, the definition of model characteristics of modern competitive activity of world-class athletes remains an urgent task of the theory and practice of sports.

Objective of the study was to perform a comparative study of the performance traits of male and female

wrestlers in the disciplines of freestyle and Greco-Roman wrestling at the Olympic Games in Paris in 2024.

Methods and structure of the study. The following methods were used in the work: analysis of scientific and methodological literature, video analysis and timing of fights for the first and third places in each weight category at the Olympic Games in Paris (2024) in wrestling among men and women (disciplines - freestyle and Greco-Roman wrestling), methods of mathematical statistics. At the beginning of the study, a video analysis of competitive fights at the Olympic Games in Paris (2024) was carried out, on the basis of which the following characteristics of the competitive activity of wrestlers were calculated: average bout time, average time of wrestling in a standing position and on the ground separately; activity and reliability of wrestling in a standing position, overall effectiveness of the bout, as well as effectiveness in wrestling in a standing position and on the ground separately, high-scoring. Then a comparative analysis of the competitive activity indicators of male and female wrestlers in the disciplines of freestyle and Greco-Roman wrestling was carried out. At the end of the work, conclusions and recommendations were formulated.

Results of the study and discussion. The table presents the calculated indicators of the competitive activity of male and female wrestlers (disciplines - freestyle and Greco-Roman wrestling) in the final fights for first and third places at the Olympic Games in Paris (2024).

The table shows that the number of weight categories and the number of fights for medals are the same for all disciplines. With the fight regulations being two 3-minute periods with a 30-second break for all athletes, the average fight time for men (discipline – freestyle wrestling) is 5 minutes 27 seconds, which is 18 seconds longer than in Greco-Roman wrestling and 1 minute 6 seconds longer than for women. This suggests that the number of early victories for women is significantly higher than for men in both disciplines, which indicates that women's fights are more spectacular and can also be explained by insufficient competition, which is reflected in the difference in the class of athletes fighting for medals. This is due to the fact that women's wrestling (discipline – freestyle wrestling) is a fairly young sport and has only been in the Olympic Games program since 2004. It is worth noting that men (discipline – freestyle wrestling) spend more time in the standing position than others. Thus, the ratio of the average time of wrestling in a standing position to the average time of wrestling on the ground is maximum for them and amounts to 6,5, while for women this ratio is only 4,0. In a standing position, men (discipline – freestyle wrestling) made a total of 189 real attacks of which only 82 were assessed by the judges at 139 points. For Greco-Roman wrestling, these indicators were 70, 57, 74, and for women 116 and 53, 101, respectively. For a correct comparison of these indicators, they must be normalized per unit of time and per athlete, that is, to calculate the activity and effectiveness of wrestling in a standing position. The calculated values of these indicators are presented in the table, from which it is clear that the highest values of both activity and effectiveness are

Performance indicators in the final bouts for first and third place at the Olympic Games in Paris (2024).

Indicators	Freestyle Wrestling (Men)	Greco-Roman Wrestling (Men)	Freestyle Wrestling (Women)
Number of weight categories, pcs.	6	6	6
Number of fights for medals, pcs.	18	18	18
Average fight time, min, sec	5 min 27 s	5 min 09 s	4 min 21 s
Ratio of average time of fight in stand-up to average time of fight in ground fighting	6,5	6,0	4,0
Number of assessed actions in stand-up, pcs.	82	57	53
Number of points won in stand-up, pcs.	139	74	101
Number of real attacks in stand-up, pcs.	189	70	116
Activity of fight in stand-up, TTA/min	1,11	0,44	0,92
Effectiveness of fight in stand-up, points/min	0,82	0,47	0,80
Reliability of attack in stand-up, %	43	81,4	45,7
Number of assessed actions in ground fighting, pcs.	23	16	16
Number of points won in ground fighting, pcs.	45	35	32
Effectiveness of fight in ground fighting, points/min	1,71	1,33	1,02
Effectiveness of fight, points/min	0,94	0,59	0,85
High-scoring, %	5,7	4,1	4,3

observed in men (discipline – freestyle wrestling) and amount to 1,11 real attacks per minute and 0,82 points per minute per wrestler. The values of these indicators are slightly lower for women and amount to 0,92 and 0,8, respectively.

In Greco-Roman wrestling, they are significantly lower and equal to 0,44 and 0,47, respectively. At the same time, the reliability of the attack in Greco-Roman wrestling is the highest and is 81,4%, while in freestyle wrestling, this figure is almost two times lower and is 43% for men and 45,7% for women. This suggests that Greco-Roman wrestling representatives prefer to wrestle as reliably as possible, minimizing attempts to attack, excluding risky actions, which leads to a significant decrease in the dynamism and spectacle of a wrestling match and, ultimately, the popularity of this sport. The International Federation of United Wrestling Styles UWW has been trying to solve this problem for several decades by changing the points of the competition rules, but, as we can see, so far without success.

In ground wrestling, men (discipline – freestyle wrestling) performed 23 TTD, estimated at 45 points. For women specializing in freestyle wrestling and men (discipline – Greco-Roman wrestling), these indicators are approximately equal and amount to 16 TTA estimated at 35 points and 16 TTA estimated at 32 points, respectively. Calculation of the effectiveness of wrestling on the ground shows that, as in the standing position, the value of the indicator is maximum for men (discipline – freestyle wrestling) and amounts to 1,71 points per minute, for Greco-Roman wrestlers it is 1,33, and for women 1,02. Thus, the effectiveness of wrestling on the ground is more than twice as high as the effectiveness of wrestling in the standing position for men in both disciplines and 1,27 times higher for women. This requires a significant revision of the methods of training athletes with an emphasis on improving technical and tactical actions on the ground, especially for men. Calculation of the effectiveness of the entire bout gives similar results: the value of the indicator is maximum for men (discipline – freestyle wrestling) and is 0,94 points per minute, for women 0,85 and Greco-Roman wrestlers 0,59. In conclusion, let us move on to the analysis of such a SD indicator as high-scoring. The table shows that the share of high-scoring techniques from the total number of assessed TTA is quite small and lies within the range from 4,1% to 5,7% depending on the sports discipline. At the same time, the maximum value of this indicator also belongs to men (discipline – freestyle wrestling). This suggests that athletes prefer to perform more reliable, albeit less assessed TTA.

Conclusions. The analysis of the competitive activity of male and female wrestlers (disciplines – freestyle and Greco-Roman wrestling) at the Olympic Games in Paris (2024) showed that the main indicators of the entertainment and success of a wrestling match, such as activity, effectiveness and high-scoring, are maximum for men specializing in freestyle wrestling, and minimum for Greco-Roman wrestlers. The differences in these indicators are significant and range from 1,29 to 2,52 times. This suggests significant differences in the system of training young athletes, which is not reflected in the content of the federal standard of sports training for the sport of "wrestling". The effectiveness of wrestling on the ground is more than twice as high as that of wrestling in a standing position for men in two disciplines and 1,27 times higher for women. This requires a significant revision of the methodology for training athletes with an emphasis on work on the ground, especially for men.

References

1. Akopyan A.O., Novikov A.A. Analiz kharakteristik sorevnovatelnoy deyatelnosti kak faktor postroyeniya trenirovochnogo protsessa v yedinoborstvakh. Study guide. Moscow: VNIIFK publ., 1985. 18 p.
2. Latyshev S.V. Analiz taktiko-tekhnicheskikh deystviy bortsov svobodnogo stilya na Igrakh XXVI Olimpiady v Atlante. Teoriya i metodika fizicheskogo vospitaniya i sporta. 2000. No. 2-3. pp. 20-23.
3. Latyshev S.V., Gromakov A.Yu., Chocharay Z.Yu. Sravnitelnyy analiz kharakteristik sorevnovatelnoy deyatelnosti bortsov volnogo stilya na Olimpiyskikh igrakh v Atlante i Sidnee. Pedagogika, psikhologiya i metodiko-biologicheskiye problemy fizicheskogo vospitaniya i sporta. Collection of scientific papers. Yermakov S.S. [ed.]. Kharkov, 2001. No. 26. pp. 45-52.
4. Platonov V.N. Sistema podgotovki sportsmenov v olimpiyskom sporte. Obshchaya teoriya i yeye prakticheskiye polozheniya. Kyiv: Olimpiyskaya literatura publ., 2004. 808 p.
5. Skirene V., Satkunskene D., Zuozene I.Yu. Analiz sorevnovatelnoy deyatelnosti plovtsov kak osnova individualizatsii trenirovochnogo protsessa. Pedagogika, psikhologiya i metodiko-biologicheskiye problemy fizicheskogo vospitaniya i sporta. Kharkov, 2006. No. 7. pp. 112-115.
6. Shustin B.N. Problema razrabotki modelnykh kharakteristik sorevnovatelnoy deyatelnosti sportsmenov. Teoriya i praktika fizicheskoy kultury. 1983. No. 11. pp. 25-27.

Enhancing the efficiency of the offensive attack for experienced volleyball players, considering their physical balance metrics

UDC 796.325

Dr. Hab., Associate Professor **N.V. Lutkova**[1]
Dr. Hab., Professor **Yu.M. Makarov**[1]
PhD, Associate Professor **G.V. Zarodnyuk**[2]
N.D. Alekseeva3
[1]Lesgaft National State University of Physical Education, Sport and Health, St. Petersburg
[2]Saint-Petersburg Mining University of Empress Catherine II, St. Petersburg
[3]Baltic State Technical University "VOENMEH" named after D.F. Ustinov, St. Petersburg

Corresponding author: nataliya_lutkova@mail.ru

Received by the editorial office on 29.01.2025

Abstract

Objective of the study was to increase the effectiveness of an offensive strike among skilled volleyball players, it is important to take into account the body's balance.

Methods and structure of the study. The evaluation of volleyball activities was conducted within the framework of the St. Petersburg Championship for men's teams in the 2022-2023 season. A customized version of the Data Volley software was employed to monitor the progress of competitive performances. To pinpoint a single technical and tactical action, the video camera was positioned behind the front line of the court, and the effectiveness of the offensive strike was assessed in accordance with the classification outlined in the manual for this software. A total of 32 matches between the two teams were analyzed. The study aimed to assess the readiness of the players to execute an offensive strike. The analysis of body balance indicators was conducted using the ST-150 stability platform. The experiment involved exercises designed to strengthen the muscles responsible for maintaining body balance. The study involved 24 volleyball players, representing the SSHOR Ekran and Peterburgaz teams.

Results and conclusions. 1. It has been confirmed that the initial indicators of physical equilibrium and balance control in volleyball teams are consistent. 2. The appropriateness of incorporating exercises to enhance the muscles responsible for maintaining physical equilibrium has been established in three distinct areas: strengthening the musculoskeletal system of the ankle joint, strengthening the muscles of the back and spine, and developing jumping ability and managing physical equilibrium. 3. It has been observed that the improvement in jumping performance is closely linked to the development of physical equilibrium and balance control in volleyball players. 4. It has been determined that the players in the experimental group significantly improved their performance in executing offensive strikes during competitive matches.

Keywords: *body balance, means, efficiency, skilled volleyball players.*

Introduction. Volleyball regulations provide for an increase in the number of competitive events. Powerful and fast attacking hits in modern volleyball often determine the outcome of a match and require specialized training of players [5]. When improving an attacking hit, the issue of developing jumping ability as “the ability to maximize concentration of muscular and volitional efforts in a minimum period of time when overcoming vertical and horizontal distances” remains relevant [3, 7]. Jumping ability indicators for an attacking hit depend on the axis and plane of the human body during the run-up and jump phase [1]. The balance of the human body is maintained by the coordinated activity of the skeletal muscles under the control of the cerebral cortex. Body vibrations are indirectly recorded by the movement of the projection of the general center of gravity along the support area [6, 4]. The narrowly targeted exercise blocks identified during the study help strengthen the skeletal muscles that ensure the balance of the body. Body balance and balance control indicators contribute to the growth of jumping ability indicators, which determine the effectiveness of an attacking hit by qualified volleyball players. The results can serve as goals for the training process.

Objective of the study was to increase the effectiveness of an offensive strike among skilled volleyball players, it is important to take into account the body’s balance.

Methods and structure of the study. The evaluation of volleyball activities was conducted within the framework of the St. Petersburg Championship for men's teams in the 2022-2023 season. A customized version of the Data Volley software was employed to monitor the progress of competitive performances. To pinpoint a single technical and tactical action, the video camera was positioned behind the front line of the court, and the effectiveness of the offensive strike was assessed in accordance with the classification outlined in the manual for this software. A total of 32 matches between the two teams were analyzed. The study aimed to assess the readiness of the players to execute an offensive strike. The analysis of body balance indicators was conducted using the ST-150 stability platform. The experiment involved exercises designed to strengthen the muscles responsible for maintaining body balance. The study involved 24 volleyball players, representing the SSHOR Ekran and Peterburgaz teams.

For statistical processing of the obtained results from the sample, the Microsoft Office Excel 2021 and STATGRAPHICS 18 computer software package was used.

Results of the study and discussion. The analysis of the performance indicators of the attacking strike and jumping ability indicators of the male volleyball players shows that the teams participating in the study are homogeneous. At the first stage of the experiment, no significant differences were found in the indicators of balance and body balance control among the players of the Ekran team, 49,01±19,26 and 48,25±14,58 points, and PetersburgGaz, 48,91±15,56 and 53,0±18,66 points, respectively. To conduct the pedagogical experiment, exercises were determined to strengthen the muscles that maintain balance. The exercises are grouped into three target blocks:

Block 1. Strengthening the muscular-ligamentous apparatus of the ankle joint.

Block 2. Strengthening the muscles of the back and spine. Block 3. Developing jumping ability and improving balance control. The following load dosage was envisaged when performing the compiled exercises during the training session: six exercises performed in series (four series), with a rest interval between series of 1-2 minutes [2]. Examples of exercises are shown in the figure.

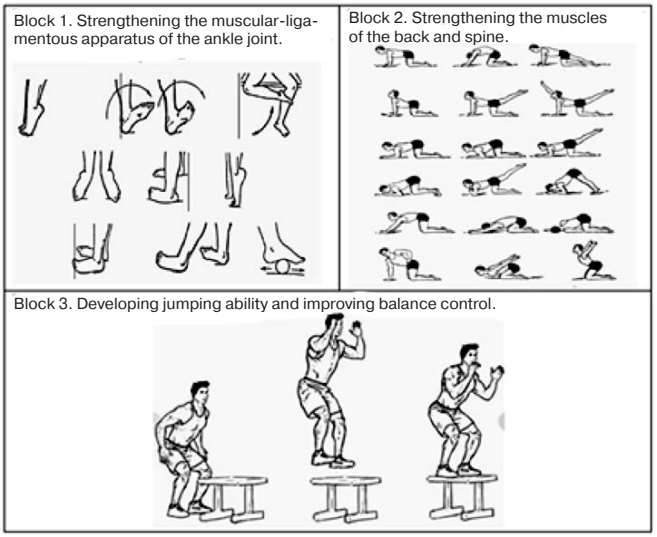


Figure 1. Examples of exercises in three blocks

A repeated study of the balance indicators in the experimental group shows that the balance and body balance control indicators have positive dynamics and correspond to the assessment well: 74,66±15,33 points and 79,0±13,5 points. In the second group, no increase in the balance and body balance control indicators was found: 48,25±14,58 and 53,0±18,66 points. A comparative analysis of the studied indicators of both groups shows the presence of statistically significant differences between them. During repeated testing, significant differences in jumping ability indicators in three tests were determined between the groups (Table 1).

The results of the testing allow us to state that the use of exercises in the training process, the target set-

Table 1. Volleyball players' jumping performance after the experiment

Indicator	(X±Sx)		P-value	Conclusion on the difference
	EG	CG		
Jump up from a standing position, cm	67,16±1,38	64,58±1,18	0,0057	p≤0,05
Jump up after three steps, cm	71,33±1,22	67,66±1,06	0,0021	p≤0,05
Jump up after three steps reaching the height, cm	299,25±1,34	291,0±1,46	0,0001	p≤0,05

Table 2. Efficiency of the attacking strike in two groups before and after the experiment

Indicator	Group	(X±Sx)	
		Before	After
Attacking Strike Efficiency,%	Experimental	34,22 ± 1,66	41,81 ± 1,73
P-valu		0,0023	
Conclusion on the Difference		p≤0,05	
Attacking Strike Efficiency,%	Control	34,5±1,81	35,26±1,43
P-valu		0,1846	
Conclusion on the Difference		p>0,05	

ting of which is to strengthen the muscles that ensure the maintenance of balance, is appropriate, this contributes to the increase in jumping ability of volleyball players. The dynamics of the efficiency indicators of the execution of an attacking strike of two groups during the competitions is presented in Table 2.

An analysis of statistical recording of the effectiveness of the attacking strike in a team of qualified volleyball players, whose participants performed specialized exercises to strengthen the muscles that ensure the maintenance of balance, made it possible to establish a significant increase in the studied indicator.

Conclusions. 1. It was established that the initial indicators of body balance and equilibrium management in volleyball teams are homogeneous. 2. The expediency of identifying exercises to strengthen the muscles that maintain body balance in three target blocks (to strengthen the muscular-ligamentous apparatus of the ankle joint; to strengthen the muscles of the back and spine; to develop jumping ability and body balance management) was determined. 3. It was revealed that the growth of jumping indicators is accompanied by the dynamics of indicators characterizing body balance and balance management in volleyball players. 4. It was determined that the effectiveness of performing an attacking blow during competitive activities significantly increased in the players of the experimental group.

References

1. Blyum Yu.E., Balkarova E.O. Dinamika myshechnykh asimmetriy v usloviyakh fizicheskikh nagruzok. Vestnik vosstanovitelnoy meditsiny. 2008. No. 6 (28). pp. 81-82.
2. Lyashevskiy D.S., Lutkova N.V. Razvitiye pryguchesti u voleybolistov 15-16 let na osnove primeneniya uprazhneniy, napravlennykh na vyravnivaniye osi tela. Chelovek v mire sporta. Proceedings of the All-Russian scientific-practical conference of young researchers with international participation. St. Petersburg: NGU im. P.F. Lesgafta, 2021. pp. 85-89.
3. Rudenko G.V., Gorelikov V.G., Ivashev V.K. Optimizatsiya vypolneniye sportivnoy tekhniki dvizheniy na osnove soglasovaniya prilagayemoy sily i sily tyazhesti. Teoriya i praktika fizicheskoy kultury. 2020. No. 3. pp. 28-30.
4. Usachev V.I. Otsenka dinamicheskoy stabilizatsii tsentra davleniya stop po dannym vektorov statokinezigrammy. Izvestiya YuFU. Tekhnicheskiye nauki. Tematicheskiy vypusk: «Meditsinskiye informatsionnyye sistemy». 2008. No. 6 (83). pp. 124-128.
5. Chechetkina I.Yu., Kozhevnikov I.M., Semenov S.A. et al. Pokazateli, opredelyayushchiye effektivnost ispolzovaniya napadayushchego udara odnoy rukoy u kvalifitsirovannykh voleybolistov. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2021. No. 11 (201). pp. 517-520.
6. Shchetinina S.Yu., Krivosheeva D.A. Razvitiye pryguchesti v trenirovochnom protsesse voleybolistov. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2020. No. 2 (180). pp. 469-476.

The performance indicators of elite athletes aged 15-16 in sports-related activities

UDC 796.015.6 : 612.766.1

Dr. Hab., **K.G. Zelenskiy**[1]
Dr. Hab., Professor **G.N. Ponomarev**[2]
Dr. Hab., Professor **V.F. Kostyuchenko**[3]
PhD, Professor **V.D. Zverev**[3]
[1]Stavropol State Pedagogical Institute, Stavropol
[2]The Herzen State Pedagogical University of Russia, St. Petersburg
[3]Lesgaft National State University of Physical Education, Sport and Health, St. Petersburg

Corresponding author: ardf_zelenskii@mail.ru

Received by the editorial office on 27.08.2024

Abstract

Objective of the study was to pinpoint the characteristics of the athletic performance of adolescents aged 15-16 in sports radio direction finding during the process of energy provision for muscular activity in the context of aerobic-anaerobic transition.

Methods and structure of the study. The research was conducted in Kislovodsk in November 2023, during the training camps. The participants were 12 members of the Russian youth national team in the age group of 15-16 years, including one Master of Sports, eight Candidates for Master of Sports, and three athletes with first-category status.

During the experiment, a treadmill test was performed. The participants performed muscle work with gradually increasing load until they reached exhaustion. Breathing was monitored to measure the concentration of oxygen and carbon dioxide in nanometers, while heart rate and lactate levels in the blood were also determined.

Based on the collected data, the aerobic and anaerobic thresholds were calculated, expressed in terms of running speed, oxygen consumption per minute, and heart rate.

Results and conclusions. It was discovered that the lactate levels in the blood of skilled athletes aged 15-16 who participate in sports radio direction finding are within the expected range and are equal to 2,4 mmol·l^{-1} at the aerobic threshold and 4,3 mmol·l^{-1} at the anaerobic threshold. The average speed at the anaerobic threshold is 3,01 m*s^{-1}, at the anaerobic threshold – 4,02 m*s^{-1}, and at the maximum power consumption – 4,71 m*s^{-1}.

The most informative indicators in sports radio direction finding for skilled athletes aged 15-16 are the oxygen consumption at the anaerobic threshold, the speed at the anaerobic and maximum power consumption thresholds.

Keywords: *sports radio direction finding, maximum oxygen consumption, aerobic threshold, anaerobic threshold, lactate, pulmonary ventilation, oxygen pulse.*

Introduction. Physical performance is manifested in various forms of muscular activity. In turn, functional capabilities determine the level of physical performance. That is why information about physical performance and, in particular, about the functional capabilities of athletes are necessary components of the management of the process of sports training in sports radio direction finding [2].

Important objective factors that determine physical performance and functional capabilities of an athlete include, among other things, the power, capacity and efficiency of the mechanisms of aerobic and anaerobic energy supply. That is why, in a narrower sense, physical performance is considered as the functional state of the cardiorespiratory system [3]. The main factor of physical performance is considered to be the indicator of maximum aerobic power - maximum oxygen consumption ($\dot{V}O_{2\ max}$ or VO_{2max}). However, for a more complete assessment of the state of the cardiorespiratory system, it is also important to have data on the functional state of aerobic and anaerobic processes. In endurance competitions, including when covering a competitive distance in sports radio direction finding, performance is determined not only by the aerobic power ($\dot{V}O_{2\ max}$) of the athlete, but also by the ability to use a larger share of aerobic performance (% of $\dot{V}O_{2\ max}$) for a sufficiently long time and thereby maintain the distance speed. It follows that to assess the athlete's performance, it is necessary to determine the threshold of anaerobic metabolism (AnT), which is characterized by the ratio of aerobic and anaerobic energy production.

For the most complete disclosure of the aerobic-anaerobic transition, the aerobic threshold (AeT) is

determined, which denotes the upper limit of the process of aerobic energy supply and the anaerobic threshold (AnT), characterized by the onset of a pronounced upward deviation of the lactate curve and other indicators of external respiration. An important indicator characterizing the efficiency and effectiveness of the cardiorespiratory system during physical exertion is the oxygen pulse indicator, which reflects the amount of oxygen transported to the tissues consuming it (including muscles) during one heartbeat [1]. Determining these indicators is a necessary condition for assessing the impact of training loads on the athlete's body and dosing their volume and intensity during sports training.

Objective of the study was to pinpoint the characteristics of the athletic performance of adolescents aged 15-16 in sports radio direction finding during the process of energy provision for muscular activity in the context of aerobic-anaerobic transition.

Methods and structure of the study. The scientific work involved 12 young men, members of the Russian youth national team in sports radio direction finding aged 15-16 (1 - Master of Sports, 8 - Candidate Master of Sports, 3 athletes of the 1st category). The study was conducted in November 2023 in the conditions of a training camp in Kislovodsk.

The test was conducted using the Treadmill H/P Cosmos Quasar. When performing the work, the angle of inclination on the treadmill was 1%. Muscle work was performed with a stepwise increasing load until «failure». The initial running speed corresponded to 2.5 m·s^{-1}, with a subsequent increase in speed at each step by 0.5 m·s^{-1}. The duration of each step is 3 min.

During the entire testing period, as well as during the recovery period, air was sampled to measure the concentration of oxygen and carbon dioxide in it, and heart rate was determined. Analysis of inhaled and exhaled air was performed using a Metalyzer 3B-R2 automatic gas analyzer (Cortex, Germany). Based on the data obtained, oxygen consumption ($\dot{V}O_2$) and $VO_{2\,max}$ ($\dot{V}O_{2\,max}$), lung ventilation ($\dot{V}E$) (l·min^{-1}), and carbon dioxide excretion ($\dot{V}CO_2$) were determined.

The values of the aerobic (AeT) and anaerobic (AnT) thresholds were determined, expressed as running speed (m·s^{-1}), the level of minute oxygen consumption ($\dot{V}O_2$ – ml·kg^{-1}·min^{-1}, % of $\dot{V}O_{2\,max}$) and heart rate (min^{-1}). Heart rate (min-1) was recorded using a Polar heart rate monitor. Before testing and 10 s before the speed increase at each stage, capillary blood was taken to determine the lactate concentration (La, mmol·l^{-1}). The concentration of lactate in the blood was determined using the EKF Biosen C_Line analyzer.

Determination of aerobic performance, including threshold values of aerobic-anaerobic metabolism was carried out by analyzing the dynamics of indicators by finding the «inflection» points of the ventilation parameter curves, heart rate, as well as the dynamics of lactate accumulation in the blood.

Oxygen pulse (OP - O_2 pulse) was defined as the ratio of the volume of oxygen consumption ($\dot{V}O_2$) to the heart rate (HR) and was expressed in milliliters per contraction (ml·beat^{-1}). In order to determine the influence of various indicators of aerobic and aerobic-anaerobic performance on the sports results in sports radio direction finding among young men aged 15-17, two control runs were held in the conditions of training camps, one in the sprint and one at the classic distance in the range of 3.5 MHz.

In the sprint, the distance was 2 km. Athletes searched for seven radio transmitters, which operated in the mode of – 12 seconds of work, 28 seconds of

Localization criteria of aerobic and aerobic-anaerobic performance indicators of qualified athletes aged 15-16 years in sports radio direction finding (± σ)

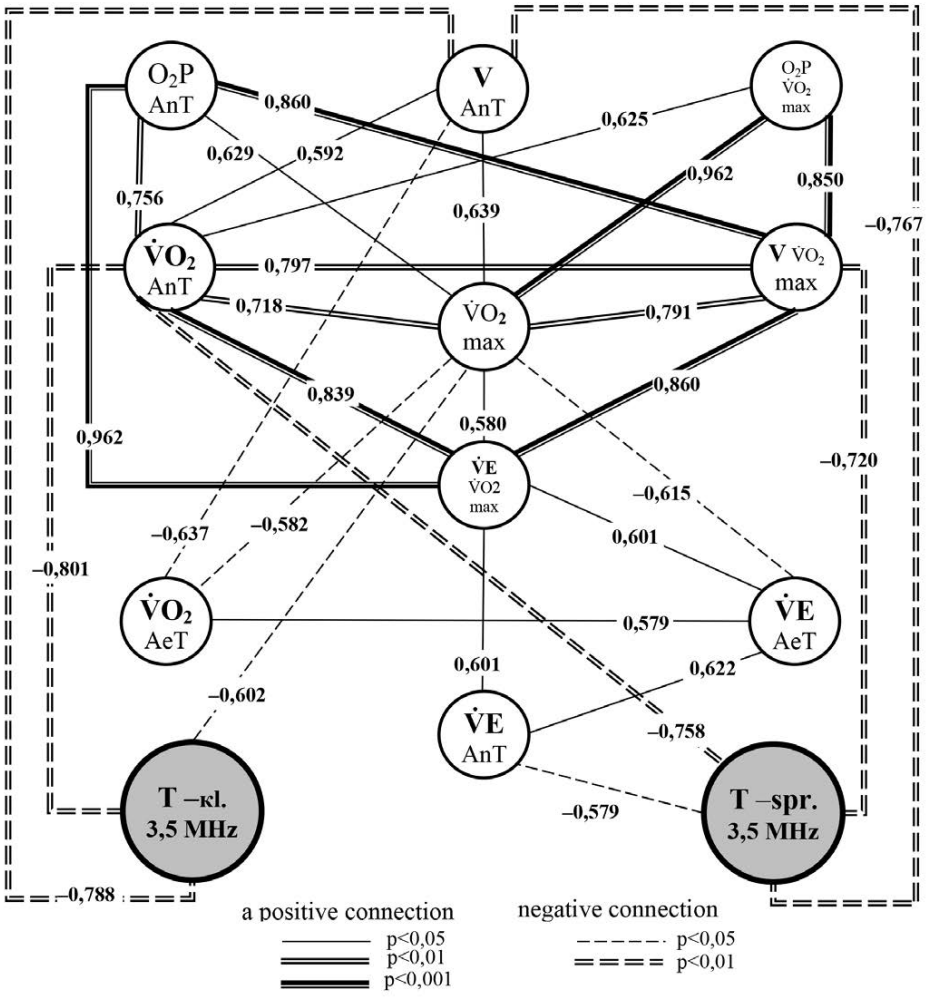
Indicator	Localization criteria		
	AeT	AnT	$\dot{V}O_2$ max
Oxygen consumption ($\dot{V}O_2$), ml·kg^{-1}·min^{-1}	37,0±1,3	47,8±2,5	54,4±4,8
HR, min^{-1}	158,1±11,2	182,5±6,1	194,8±6,4
Blood lactate concentration (La), mmol·l^{-1}	2,4±0,8	4,3±0,7	7,5±1,1
Lung ventilation ($\dot{V}E$), l·min^{-1}	62,1±13,1	98,8±19,5	132,5±16,7
Running speed (V), m·s^{-1}	3,01±0,28	4,02±0,30	4,71±0,28
$\dot{V}O_2$ from $VO_{2\,max}$ ($\dot{V}O_{2\,max}$), %	68,9±6,6	85,7±5,2	100,0
Oxygen pulse (O_2 pulse), ml·beats^{-1}	14,7±2,2	16,3±1,9	17,3±1,6
Weight, kg	62,5±9,2		
Height, cm	178,2±5,3		

pause. The average time to cover the distance in the sprint was – 17.10,0±02.16,0.

At the classic distance, the effective length of the track was 6 km. Athletes searched for five radio transmitters, operating in the mode of – 1 min of work, 4 min of pause. The average time to cover the distance was – 35.34,0±03.11,0.

Results of the study and discussion. The results obtained during the testing are presented in the table.

It was found that in qualified athletes aged 15-16 years in sports radio direction finding the $VO_{2\,max}$ index ($\dot{V}O_{2\,max}$) corresponds to 54,4±4,8 ml·kg^{-1}·min^{-1} with a heart rate of 194,8±6,4 min^{-1}. At the $\dot{V}O_{2\,max}$ level, the pulmonary ventilation indices ($\dot{V}E$) are localized within 132,5±16,7 l·min^{-1}, oxygen pulse (O_2 pulse) – 17,3±1,6 ml·beats^{-1}, blood lactate concentration (La) – 7,5±1,1 mmol·l^{-1}. Running speed (V) is equal to 4,71±0,28 m·s^{-1}. At the aerobic threshold (AeT), the concentration of lactate in the blood (La) is 2,4±0,8 mmol·l^{-1}. Oxygen consumption ($\dot{V}O_2$) at AeT is 37,0±1,3 ml·kg^{-1}·min^{-1}, which corresponds to 68,9% of $\dot{V}O_{2\,max}$. In this case, the heart rate is localized at the level of 158,1±11,2 min^{-1}, pulmonary ventilation ($\dot{V}E$) is 62.1±13.1 l·min^{-1}, oxygen pulse (O_2 pulse) is 14,7±2,2 ml·beats^{-1}. Running speed (V) at AeT is 3,01±0,28 m·s^{-1}. The upper limit of the aerobic-anaerobic transition (anaerobic threshold - AnT) is characterized by the following parameters. The concentration of lactate (La) in the blood is 4,3±0,7 mmol·l^{-1}, with a heart rate of 182,5±6,1 min^{-1}. Running speed (V) at AnT is 4,02±0,30 m·s^{-1}. Oxygen consumption ($\dot{V}O_2$) is 85,7% of $\dot{V}O_{2\,max}$ with a value of 47,8±2,5 ml·kg^{-1}·min^{-1}. The ventilation rate of the lungs ($\dot{V}E$) is 98,8±19,5 l·min^{-1}, oxygen pulse (O_2 pulse) is 16,3±1,9 ml·beats^{-1}. The test results show that athletes aged 15-16 have quite high oxygen consumption rates at the aerobic-anaerobic transition boundary (85% of $\dot{V}O_{2\,max}$), which is a high indicator of aerobic performance. However, despite the fact that the athletes under study have quite high sports titles (MS) and ranks (CMS), they still have not yet reached the proper level



Correlation graph characterizing the interrelations of cardiorespiratory system parameters and their influence on the sports result in the disciplines of «sprint» and «classic» in sports radio direction finding in qualified athletes aged 15-16 years. Explanation of symbols in the text

of functional development corresponding to adult athletes. It can be assumed that the high percentage of oxygen consumption (relative to $\dot{V}O_{2\ max}$) at the AnT level in young men aged 15-16 is due to a lower activity of the glycolysis enzyme, phosphofructokinase, relative to adult athletes [3]. A correlation analysis was conducted to determine the influence of various functional indicators of the cardiorespiratory system at the aerobic (AeT) and anaerobic (AnT) thresholds on the result of passing a competitive distance in sports radio direction finding in young men aged 15-16, as well as their interrelationships. The intercorrelation matrix obtained as a result of data processing made it possible to identify relationships at the reliability level from $p<0,05$ to $p<0,001$ (see the figure).

The analysis of intercorrelations showed that when covering a distance in a sprint, the following factors have a strong reliable effect on the result (time) (T – 3.5 MHz sprint): the speed of movement of the athlete at the level of AnT (VAnT) ($r= -0,767$; $p<0,01$), the speed of movement at the level of $\dot{V}O_{2\ max}$) ($r= -0,720$; $p<0,01$) and oxygen consumption at the level of AnT ($\dot{V}O_2$AnT) ($r=-0,758$; $p<0,01$).

When an athlete runs a distance in the «classics», a close reliable relationship ($p<0,01$) with the result (time) (T – class. 3,5 MHz) is observed with oxygen consumption at the level of AnT (VO_2 AnT) ($r=-0,801$) and the speed of movement at the AnT level (VNP) ($r=-0,788$; $p<0,01$). The analysis of intercorrelations showed that the most important and informative performance criteria for qualified athletes aged 15-16 years in sports direction finding are oxygen consumption at the AnT level (VO_2 AnT), running speed at the IPC level ($VO_{2\ max}$) and ventilation (VE) at the IPC level ($VO_{2\ max}$) (see Figure The VO_2 AnT index has a strong reliable association with lung ventilation (VE) at the level of MPC ($VO_{2\ max}$) ($r=0,839$; $p<0,001$), with MPC (VO2 max) ($r=0,718$; $p<0,01$), with running speed (V) at the level of MPC ($VO_{2\ max}$) ($r=0,797$; $p<0,01$) and oxygen pulse (OP) at the AnT level ($r=0,756$; $p<0,01$). In addition, there is an average significant association ($p<0,05$) with running speed at the AnT level ($r=0,592$) and oxygen pulse (OP) at the MPC level ($r=0,625$). Running speed (V) at the MPC level ($VO_{2\ max}$), except with VO_2 AnT, closely correlates with lung ventilation (VE) at the MPC level ($VO_{2\ max}$) ($r=0,860$; $p<0,001$), with MPC ($VO_{2\ max}$) ($r=0,791$; $p<0,01$), with oxygen pulse (CP) at the AnT level ($r=0,860$; $p<0,001$) and at the MPC level ($VO_{2\ max}$) ($r=0,850$; $p<0,001$). In turn, the lung ventilation index (VE) at the $VO_{2\ max}$ level, in addition to running speed at the $VO_{2\ max}$ and VO_2 AnT levels, has a strong association with OP at the AnT level ($r=0,962$; $p<0,001$), an average association with $VO_{2\ max}$ ($r=0,580$; $p<0,05$), with VE at at the AnT level ($r=0,601$; $p<0,05$) and with VE at the AeT level ($r=0,601$; $p<0,05$). It should also be noted that with all these indicators, there is a different, from moderate to strong, reliable relationship with the MPC index ($VO_{2\ max}$) (see Figure).

Conclusions. The results obtained in the course of the study showed that the concentration of lactate (La) in the blood of qualified athletes aged 15-16 in sports radio direction finding at aerobic and anaerobic thresholds is localized within the generally accepted limits and equals, respectively, 2,4 and 4,3 mmol·l^{-1}, and at a heart rate of 158 min^{-1} – AET, 182 min^{-1} – AnT. It is noted that individual indicators may differ significantly from the average values. Thus, in the course of the study it was established that with AET the minimum and maximum La indicators in the blood were, respectively, – 1,8 and 3,1 mmol·l^{-1}, with AnT – 3,4 and 5,5 mmol·l^{-1}. This factor must be taken into account when dosing the intensity of training loads. It was determined that the average running speed at the AET level in 15-16 year old boys is 3,01 m·s^{-1}, at the AnT level – 4,02 m·s^{-1}, at the MPC level – 4,71 m·s^{-1}. It was established that the most informative performance criteria in sports radio direction finding in qualified athletes aged 15-16 are the oxygen consumption indicators at the AnT level, running speed at the MPC level, and lung ventilation at the MPC level. In addition, the oxygen consumption indicators at the AnT level, the athlete's speed at the AnT and MPC levels have a direct impact on the results of passing distances in sprint and «classic».

References

1. Zakharevich A.L., Marchenko D.S., Titova E.M. Prakticheskiye aspekty stress-testa s gazoanalizom sportsmenov razlichnykh vidov sporta. Practical guide. Minsk: RNPTS sporta publ., 2022. 36 p.
2. Zelenskiy K.G., Ponomarev G.N. Issledovaniye zon intensivnosti pri prokhozhdenii klassicheskoy distantsii v sportivnoy radiopelengatsii yunoshami 13-14 let. Teoriya i praktika fizicheskoy kultury. 2018. No. 12. pp. 57-59.
3. Tikhvinskiy S.B., Bobko Ya.N. Opredeleniye, metody issledovaniya i otsenka fizicheskoy rabotosposobnosti detey i podrostkov. Detskaya sportivnaya meditsina. S.B. Tikhvinskogo, S.V. Khrushcheva [ed.]. Moscow: Meditsina, publ. 1991. pp. 259-273.

Methodology of training leg movements in middle school age basketballers

UDC 796.323.2

Jiang Liang
Dr. Hab., Professor **I.G. Maksimenko**
Moscow State University of Sport and Tourism, Moscow, Russia

Corresponding author: maksimenko_76@mail.ru

Received by the editorial office on 07.04. 2025

Abstract

Objective of the study. To substantiate the method of training leg movements in basketball players of middle school age.
Methods and structure of the study. The research materials include theoretical sources of Russian and Chinese authors, which relate to the issue under study. In addition, also important material is the pedagogical experiment conducted by the author of the work and the analysis of the results of this experiment.
Research methods: 1. Analysis of theoretical sources. 2. Methodological analysis. 3. Pedagogical experiment.
Results of the study and their discussion. The main problems that prevent athletes from revealing their own potential in basketball are insufficient share of observation, difficulties with quick reaction time and problems with controlling the balance of their own body. The paper provides recommendations to solve these problems and contradictions.
An experiment was conducted in the paper, the results of which allowed to clearly see the effectiveness of the proposed recommendations. If at the beginning of the experiment the indicators of the participants of the experimental group were lower than those of the participants of the control group, then by the time of the experiment completion and retesting the ratio changed in the opposite direction.

Keywords: *basketball, leg training, basketball classes, sports in high school, leg exercises, basketball for schoolchildren.*

Introduction. The quality of footwork directly affects the rationality, accuracy and standardization of other technical movements. In particular, a basketball player who is good at controlling the movements of his feet, usually leads the ball better, throws it more accurately, makes better passes, etc. Therefore, the technique of leg movement is especially important when playing basketball. In training, attention should be paid to the development of athletes' lower extremities for the sake of improving game efficiency and increasing competitive performance. This is especially important for middle school students, who are still in the process of developing the basic body abilities necessary to play basketball. It is important to lay the foundation during this period on which all other basketball competencies will be built later on.

The novelty of the work lies in the fact that it not only considers the problems with leg training in middle school basketball classes and provides practical recommendations for their solution, but also conducts an experiment aimed at testing the effectiveness of the recommendations.

Objective of the study. To substantiate the method of training leg movements in basketball players of middle school age.

Methods and structure of the study. The research materials include theoretical sources of Russian and Chinese authors, which relate to the issue under study. In addition, also important material is the pedagogical experiment conducted by the author of the work and the analysis of the results of this experiment.

Research methods:

1. Analysis of theoretical sources.
2. Methodological analysis.
3. Pedagogical experiment.

Results of the study and their discussion. Footwork training in basketball represents one of the priority

tasks of a good sports coach. Footwork is a general term that encompasses a wide range of activities related to lower extremity movements in the game of basketball. Each of these actions has a clear purpose and focus related to the realization of the current strategy and tactics of the entire basketball team in the context of the role of a particular basketball player at a given moment in time. In the present paper, this issue is examined through the example of middle school students.

In the People's Republic of China, school is divided into elementary, middle and high school. Elementary school educates children from 6 to 11 years old, middle school educates children from 11 to 15 years old, and high school educates children from 15 to 18 years old. This article deals with the education of young basketball players aged 11 to 15 years old, i.e. middle school students, using the PRC as an example.

Secondary school students have not yet sufficiently developed their speed, strength and agility. They have to learn quality standardization and coordination of their own movements. Consequently, the most important task of a basketball coach is to help young athletes learn to better master their footwork during basketball practice and competition.

The problems that need to be addressed when practicing footwork in basketball are athletes' lack of observation and reaction speed, as well as difficulties in the ability to control body balance. A characterization of each of the problems is presented below, along with practical suggestions for successfully addressing them.

First, a lack of observation can prevent young basketball players from understanding what is happening in different parts of the court as well as reacting in a timely manner. Basketball is a game that involves not only the athlete's body, but also their brain. Every second the position of the game is changing rapidly, and in order to correctly direct your movements, you should understand what exactly to do and correctly select the target.

Secondly, in addition to the difficulties in observation, we should also note the lack of reaction speed of some athletes, while reaction speed directly affects the speed of movement of all parts of the body, including the legs. An athlete with a quick reaction is faster in running and jumping, hence more efficient in achieving the goal, whether it is related to defense or offense. Since a basketball player often has only a few tenths or hundredths of a second to make a decision, reaction speed can be a decisive factor.

Thirdly, the ability to control one's own body balance is also a significant challenge that many aspiring basketball players have to face. This skill will reduce the number of errors on the court and also reduce the risk of injury, so it needs to be developed.

Table 1 provides some practical suggestions to address the challenges.

As can be seen from the results of Table 1, coaches should increase the focus on practicing basketball players' leg movements. For this purpose, it is necessary to use special physical exercises. However, psychological training is also important, in particular, it implies the development of self-confidence, self-control and other important qualities.

As part of the preparation of the work, an experiment was conducted with the participation of 60 schoolchildren aged 11 to 15 years old, engaged in basketball in the framework of pre-professional training. Two groups were formed: control and experimental. There were 30 people in each group. The participants of the experimental group practiced according

Table 1. Problems preventing athletes from practicing footwork in basketball and methods of solving them

Existing Problem	Practical recommendations for its solution
Lack of observation Difficulties with reaction time	Observation and reaction speed can be developed through constant mental exercises during training. Basic basketball footwork training and psychological qualities are inseparable, therefore, to work on observation and reaction speed it is important to develop athletes' self-confidence, self-control and focus on the game without distractions.
Problems with controlling body balance	In order to control the balance of their own body, more exercises should be done to develop the lower limbs. These can be jogging, jumping rope, obstacle course running, etc. In addition to practical training, theory is also important: basketball players should understand the basic physiology of the leg muscles, as well as understand how the legs are affected by certain loads from a scientific point of view.

Table 2. Experimental results in a middle school in Changsha City, PRC

Parameter	Control group (before)	Control group (after)	Experimental group (before)	Experimental group (after)
Observation (in points)	5,2±0,8	4,5±0,6	5,1±0,5	7,8±0,9
Reaction speed (in seconds)	0,58±0,1	0,56±0,09	0,60±0,08	0,45±0,1
Balance control (in points)	6,0±0,7	6,3±0,6	5,9±0,4	7,9±0,7

to the above practical recommendations, while the representatives of the control group practiced using traditional methods of basketball training.

Two tests were performed for each participant in the experiment. The first one was carried out before the experiment, and the second one - at the end of the experiment. The results showed the average scores for each group both before and after the experiment. Observation, reaction speed, and balance control were assessed.

Table 2 shows the results of the experiment. They show improvement in both groups, however, the participants in the experimental group showed greater dynamics compared to the participants in the control group.

As can be seen from the results of Table 2, the results of the experimental group members were slightly lower at the beginning of the experiment. However, after the end of the experiment, the ratio changed and the experimental group members had significantly higher scores compared to the control group. All this indicates a high degree of effectiveness of the given practical recommendations.

Consequently, the practical approbation of the recommendations in the article suggests that there is a high degree of their effectiveness in training the legs of basketball players. Further implementation of the experimental results in training practice is recommended.

Conclusion. According to the results of the work we can make a number of conclusions. They are given below. The main problems that prevent athletes from revealing their own potential in basketball are insufficient share of observation, difficulties with quick reaction time and problems with controlling the balance of their own body. The paper provides recommendations to solve these problems and contradictions.

An experiment was conducted in the paper, the results of which allowed to clearly see the effectiveness of the proposed recommendations. If at the beginning of the experiment the indicators of the participants of the experimental group were lower than those of the participants of the control group, then by the time of the experiment completion and retesting the ratio changed in the opposite direction.

References

1. Du Juan. Analysis of footwork training in youth basketball practice // Youth Sports. - Hangzhou, 2023. №9. C. 98-99.
2. Kiseleva M. I. Development of speed and strength muscle abilities in 15-16 years old basketball players // Academic Publicity. - Ufa, 2020. № 5. C. 412-417.
3. Padun N. E., Atamanychev A. N. N., Volokhova S. V. Use of special training complexes in preparation of center players of sportsmanship improvement groups // Innovative technologies in sports games, 2021. C. 100-107.
4. Xu Ting. Research on the characteristics of physical development of adolescents and methods of teaching adolescents basketball // Neijiang Science and Technology. - Neijiang, 2021. - №38(12). C. 103-104.
5. Tang Wensheng. Research of training methods of foot movement technique in basketball // Sports Pedagogy. Lishui, 2022. №10. C. 187-188.
6. Tarataev M. V., Shipovskaya V.. V. Analysis of leg work when playing basketball // Sports medicine and rehabilitation: traditions, experience and innovations. - Krasnodar, 2024. C. 173-176.

Enhancing the physical fitness of young men through the practice of martial arts

UDC 796.011.3

PhD, Associate Professor **A.A. Tashchiyan**
D.A. Zhikharev
E.N. Lobanova
S.A. Chub
Don State Technical University, Rostov-on-Don

Corresponding author: stepan.chud@mail.ru

Received by the editorial office on 02.02.2025

Abstract

Objective of the study was to create and empirically evaluate the efficacy of a series of exercises designed to enhance the physical abilities of young males in grades 10-11 through the use of martial arts in the school's physical education curriculum.

Methods and structure of the study. The research project was conducted at St. George Secondary School in Rostov-on-Don from October 1, 2023, to May 20, 2024. Ten young men participated in the study, with five assigned to the control group and the same number to the experimental group. The research methods employed included a review of scientific and educational literature, pedagogical observation, testing, a pedagogical experiment, and statistical analysis.

Results and conclusions. The outcomes of the experiment revealed that the performance of the experimental group in the test trials was significantly superior in almost all aspects compared to the control group. This suggests that the compiled set of physical exercises proved to be highly effective and efficient, outperforming traditional basic exercises and games aimed at enhancing physical qualities in the context of physical education for young men in grades 10-11.

Based on the findings, it appears advisable to recommend the hand-to-hand combat exercise complexes developed and employed in the research work, particularly for the initial stage of training, as a more effective approach to addressing physical education objectives for high school students.

Keywords: *students, hand-to-hand combat, physical fitness.*

Introduction. One of the main tasks of physical education of young men in the senior school period is the acquisition of motor experience by mastering new physical exercises and the ability to apply them in their future work activities. However, not only the choice of further professional activity is a priority issue facing young men aged 16-17, but also serious preparation for military service. Thus, both the preparation for the upcoming transition to military service and future work activities require a sufficient level of development of physical fitness of schoolchildren. It is important to note that the rules and terminology of hand-to-hand combat are written in Russian and are deeply rooted in domestic sports theory and practice. Training methods and competitions are based on domestic schools of wrestling and boxing. Hand-to-hand combat has a huge impact on the revival of patriotic consciousness, a positive image of the defender of the Fatherland. It should be emphasized that hand-to-hand combat as a martial art is based on a solid, time-tested national philosophy based on the humane moral and spiritual norms of our people.

Objective of the study was to create and empirically evaluate the efficacy of a series of exercises designed to enhance the physical abilities of young males in grades 10-11 through the use of martial arts in the school's physical education curriculum.

Methods and structure of the study. The research was conducted at the St. George Secondary Comprehensive School in Rostov-on-Don from 01.10.2023 to 20.05.2024. The participants in the pedagogical experiment were 10 young men, 5 of whom were in the control group and the same number in the experimental group.

Results of tests for physical and functional fitness at the beginning of the experiment

№	Tests	Unit of measurement	Average value		Difference in %
			Control	Experimental	
Physical fitness					
1	60m Run	Sec	8,7±0,3	8,5±0,4	1,1
2	3000m Run	Min, sec.	13,75±0,79	13,7±0,6	0,29
3	Pull-ups on a high bar	Number of times	9,2±1,8	8,4±2,7	6,6
4	Bending and unbending arms in a lying position	Number of times	29,1±5,6	28,2±5,3	2,7
5	Forward bend from a standing position on a gymnastic bench	cm	7,7±1,8	8,4±1,6	10,5
6	Long jump from a place	cm	210,6±18,6	213,0±14,7	1,1
Functional fitness					
1	Genchi test	Sec.	37,2±6,5	34,8±5,4	6,4
2	Stange test	Sec.	82,4±7,3	76,4±11,3	7,2
3	Harvard step test	Number of times	77,8±7,1	77,6±5,2	0,2
4	Orthostatic test	Number of times	13,2±2,5	12,4±2,6	6,0

The study was conducted in several stages:

1. At the first stage, from 01.10.2023 to 31.10.2023, we were faced with the task of reviewing and analyzing scientific and methodological literature on the topic of physical education of students, the specifics of the training process in hand-to-hand combat, and the impact of physical activity on the human body. Based on the literature studied and our own experience, we compiled approximate sets of exercises based on the means and methods of physical training in hand-to-hand combat.

Also, at the first stage, both groups of subjects were tested for the level of physical and functional fitness. 2. The second stage of the study, organized from 01.11.2023 to 10.05.2024, involved the use of the compiled sets of exercises in physical education lessons in grades 10-11 and in extracurricular classes on general physical training. Also, at the end of the second stage, both groups were re-tested for physical and functional capabilities using similar tests. 3. At the third, final stage of the study from 11.05.2024 to 20.05.2024, an analysis of all the results obtained during the experimental study was carried out. All numerical data were subjected to mathematical and static processing. Theoretical and practical conclusions were formulated. The tests for determining the level of physical fitness of students were selected from the VFSK GTO complex, namely: pull-ups on a high bar, bending and unbending arms in a support position lying on the floor, running 60 meters, running 3000 meters, bending forward from a standing position on a gymnastic bench, and long jump from a standing position with a push-off with two legs.

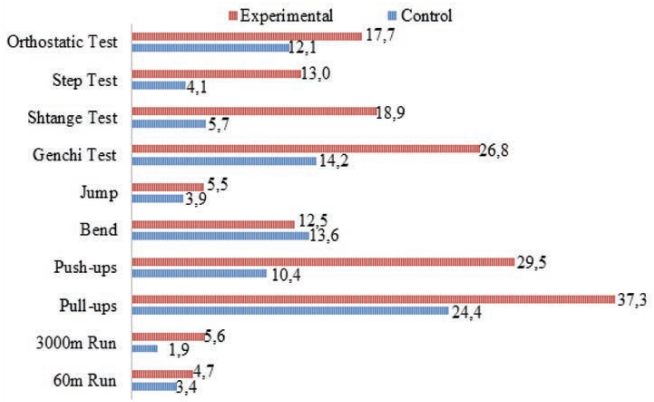
The functional fitness of the respiratory and cardiovascular systems of the students was checked by the following tests: Stange test, Genchi test during exhalation, Harvard step test, orthostatic test.

The developed set of physical exercises with hand-to-hand combat means for students of grades 10-11 in the experimental group was used to develop the basic motor skills of young men. Exercises from the set were used in the main part of both physical education lessons and extracurricular activities. Physical education lessons were held three times a week. Additionally, one hour a week was allocated for general physical training classes.

This set of physical exercises, developed using hand-to-hand combat means and technical elements, differs significantly from traditional methods of conducting physical training classes for senior schoolchildren.

Results of the study and discussion. When organizing an experimental study with young men in grades 10-11, we conducted testing at the beginning of the experiment, which allowed us to determine the initial level of physical and functional fitness of the students (see table).

Repeated testing of the subjects revealed a difference in both the physical and functional fitness of the young men of the experimental group in relation to the



Dynamics of physical and functional fitness based on the results of passing tests

control group. The results in the experimental group were significantly higher than in the control group. The young men of the experimental group showed a less significant difference in the performance of tests for flexibility and speed. During the analysis of the data after the performance of functional tests, the students of the experimental group showed the best indicators of the reaction of both the cardiovascular and respiratory systems in relation to the subjects of the control group, where the results, although lower, indicated a fairly good level of functional fitness (see figure).

Conclusions. As a result, the test results of the experimental group were significantly higher in almost all indicators compared to the control group. Based on this, we can say that the compiled set of physical exercises turned out to be quite effective and efficient, and thus proved its advantage over traditional basic exercises and games aimed at improving physical qualities in the process of physical education of young men in grades 10-11. Based on the results of the work carried out, it seems possible to recommend the hand-to-hand combat exercise sets developed and used in the research work, the initial stage of training, for a more effective solution to the problems of physical education with senior students.

References

1. Akopyan A.O., Dolganov D.I., Korolev G.A. et al. Rukopashnyy boy. Primernaya programma sportivnoy podgotovki dlya detsko-yunosheskikh sportivnykh shkol, spetsializirovannykh detsko-yunosheskikh shkol olimpiyskogo rezerva. Moscow: Sovetskiy sport publ., 2004. 116 p.
2. Aslakhanov S.A.M. Rukopashnyy boy v sisteme fizicheskogo vospitaniya shkolnikov Chechenskoy respubliki. Izvestiya Chechenskogo gosudarstvennogo pedagogicheskogo universiteta Seriya 1. Gumanitarnyye i obshchestvennyye nauki. 2020. Vol. 32. No. 3 (31). pp. 49-57.
3. Ivanova M.M., Lyugusev Yu.V., Dovranov B.D. Organizatsiya sektsii armeyskogo rukopashnogo boya vo vneurochnoy deyatelnosti starsheklassnikov. Nauchno-pedagogicheskiy zhurnal «Uchitel Altaya». 2022. No. 3 (12). pp. 65-70.

Research of training methods for serving technique in young volleyball players

UDC 796.325

Yin Yingying
Moscow state university of sports and tourism, Moscow

Corresponding author: 1660577601@qq.com

Received by the editorial office on 07.04. 2025

Abstract

Purpose of the study: To study the methods of teaching the technique of serving the ball to young volleyball players.

Methodology and organization of the study. The research material includes sources that analyze the serving skills of young volleyball players. These sources analyze the development of serving skills from both a theoretical and methodological point of view. In addition, direct observation of the training of young volleyball players in Henan Province was also conducted.

The work uses methods of analysis of theoretical sources, direct pedagogical observation and methodological development of own recommendations.

The practical significance of the research is high. Its results may be useful for volleyball coaches, methodologists of sports schools, sports psychologists, as well as for a wide range of interested parties.

Research results and conclusions. The prospects of the research consist in identifying new methods of forming the serving technique of young volleyball players, as well as in positive changes in existing methods. The article briefly outlines the important role of psychological factors that influence the serving technique of young volleyball players. Perhaps, in the future, it will be possible to study the psychological component of children's and youth volleyball in more detail, not only in the context of serving, but also in a broader aspect of training and competitive activities of young volleyball players.

Keywords: *serving, serving training, young volleyball players, volleyball game, volleyball training, sports classes, children's and youth sports, sports education methods.*

Relevance. With the development of modern volleyball, new requirements are imposed on athletes from a very young age. A high-quality serve is valued by many volleyball teams, so players who master this skill are in demand. More and more volleyball players use serving as their competitive advantage. Consequently, the development of serving skills of young volleyball players.

This paper analyzes the methods of effective training of young volleyball players on the example of improving their volleyball serving skills. For the first time, a description of the serving technique training of young volleyball players from Henan Province of the People's Republic of China is used for this purpose.

Purpose of the study: To study the methods of teaching the technique of serving the ball to young volleyball players.

Methodology and organization of the study. The research material includes sources that analyze the serving skills of young volleyball players. These sources analyze the development of serving skills from both a theoretical and methodological point of view. In addition, direct observation of the training of young volleyball players in Henan Province was also conducted.

The work uses methods of analysis of theoretical sources, direct pedagogical observation and methodological development of own recommendations.

Research results and their discussion. Serving in volleyball is a throw of the ball by a player located at the

serving line into the opponent's zone, from which the game of volleyball begins. In modern volleyball, four main types of serves are used: power, float, accurate (targeted or tactical) and with rotation. All of them are performed in an overhand manner. Serves are classified according to the main distinguishing feature that is used by practitioners in the process of work. Serving skills are among the priority competencies that need to be developed by young volleyball players, because the outcome of the entire volleyball match often depends on a well-made serve [3, p. 126].

Regardless of the type of serve, a good starting position is very important. In most cases, when serving, the athlete should face the volleyball court, feet approximately shoulder-width apart, left foot in front, right foot behind, and the center of gravity shifted to the right foot. The eyes should be focused on the opponent's court. The rules of volleyball competitions stipulate that the ball must be released within 8 seconds after the first referee's whistle. Therefore, it is better to take the initial pose in advance to achieve a positive result.

The ultimate goal of serving in the game is to achieve high ball speed, high power and an unstable landing point, which makes it difficult for the opponent to predict the reception of the serve, destroys the opponent's first pass and restrains the tactical organization of the opponent's serve. Therefore, when using different serving techniques, it is important to pay attention to a number of points, including the throw of the ball, the force of the impact, the landing point of the ball, etc.

Observing young volleyball players of both male and female gender - students of the sports school of Henan Province, the author of the work noticed that they do not pay enough attention to high-quality serving technique. This leads to deformed and inconsistent movements, which have a negative impact on the quality of the volleyball game and its results. Table 1 shows the statistics of the impact of serving quality on the results of young volleyball players' games.

As can be seen from the data in Table 1, high serving quality can increase the average number of points scored by athletes per game and minimize the risk of serving errors. In addition, a good serve also increases the likelihood of winning a volleyball match.

On the other hand, young volleyball players have little competitive experience, their psychological state is not stable enough, and it is difficult for them to concentrate. All this significantly contributes to reducing their moral stability, especially during competition, where a large number of distracting factors can hinder a high-quality volleyball game, especially in key moments. In addition, many volleyball players are panicky afraid of losing, which reduces their motivation and increases stress.

All these psychological factors ultimately lead to a bad serve or low attack power. In addition, there are also errors such as hitting the net and taking the volleyball out of bounds [6, p. 68].

If we additionally talk about distracting factors, it should be noted the particular difficulty when performing on unfamiliar courts, where they have to get used to the general atmosphere, the location of specific objects, etc. Moreover, sometimes young volleyball players travel to competitions in other cities and countries, where unfamiliar climate, fatigue from changing time zones, as well as the need to communicate in an unfamiliar language and interact with elements of a new culture in their free time from training and competitive activities can act as distracting factors. Also, volleyball fans are more likely to support the team playing on the home court than a team from another city or country. Lack of fan support also often negatively affects the motivation of athletes [4, p. 123].

Consequently, often the serving technique of young volleyball players who have come to the competition is lower than that of their opponents who play on the home court. Nevertheless, a good volleyball player should be able to make a good serve regardless of what court he is playing on and what is happening around him.

The main methods of preparing young volleyball players for serving at various stages of training may differ. Thus, at the elementary and basic stages, the priority importance is the training of young volleyball

Table 1. Influence of serving quality on the results of young volleyball players' games

Serving quality	Number of points scored during the game	Serving errors (%)	Team result (win / loss)
High	15-20	5%	80% wins
Average	8-14	12%	50% wins
Low	0-7	25%	20% wins

Table 2. Results of young volleyball players before and after the experiment

Indicator	Before the experiment	After the experiment	Change
Average percentage of successful serves	58%	82%	+24%
Average percentage of errors when serving	22%	8%	-14%
Average ball speed (km/h)	45 km/h	53 km/h	+8 km/h
Psychological stability (rated on a scale of 1 to 10)	5,5	8,2	+ 2,7

players in the basic serving skills. Throwing the ball and exercises for the hands, imitating actions in the game, should become the most important for those children who have just begun competitive activity in volleyball. This stage is important for young volleyball players in mastering and improving the skills of working with the ball, because it is at this time that the foundation is laid for the entire subsequent volleyball career of a novice athlete, while mistakes made at this stage will be difficult to correct, and sometimes almost impossible.

Methods of training young volleyball players at this stage are also important to choose based on the characteristics of their age. Often these are children of primary school age, who do not yet perceive complex theoretical explanations very well. In this case, the use of a visual method, as well as various game methods, will be more effective. Special attention should be paid to teaching children how to accurately hit the ball. It is important to show them how to choose the direction of the serve correctly, as well as how to hit the ball correctly from a technical point of view [1, p. 21].

When it comes to young volleyball players who are already at an intermediate or advanced level, it should be clarified that adolescents have much better analytical thinking skills than before, so more theoretical material can be included. In particular, this includes explaining the anatomical features of a volleyball player's body in different positions. In addition, adolescents should also be taught to analyze their actions in the process of making a more optimal choice of current serving strategy and tactics. Strengthening tactical awareness emphasizes that the serve should interrupt the opponent's offensive rhythm and limit the strategic goals of the opponent's main attacker in order to achieve a suppression effect [5, p. 191].

At this stage, attention should be paid to specific strength training of the body, as well as its individual parts. Important exercises include practicing hitting a specific target, practicing stable serving of the ball over the net, accelerating the serving rhythm, and practicing serving in conditions of constant confrontation.

As part of the study, a pedagogical experiment was conducted at the sports school of Henan Province. The experiment involved 20 young athletes aged 12 to 15 years. The duration of the experiment was 8 weeks. During this period, the athletes performed, firstly, technical exercises to improve serving (accuracy and power of the hit, stabilization of movements), and, secondly, psychological exercises aimed at concentration and stress management. The participants in the experiment also performed exercises to visualize a successful serve.

Table 2 presents the results that were obtained during the experiment. The average scores of young volleyball players before and after the experiment are shown.

According to the data in Table 2, a significant increase in successful serves and a decrease in the proportion of errors can be seen, as well as an acceleration of the ball during the serve and an increase in the psychological stability of the athlete. Psychological stability was assessed according to a survey of participants, who noted their own subjective feelings about what was happening.

Serving technology is a powerful stimulus for the development of modern offensive volleyball. It plays an increasingly important role in the development of volleyball sport at the present time. A good serve at the beginning of the game can help the team open the scoring. Opening the scoring, in turn, can help the team equalize when behind or even turn defeat into victory. An excellent serve allows not only to directly score points, but also to restrain the opponent's attack and limit the key players of the opposing team. In addition, a good serve by one young volleyball player during the game also increases the morale of the entire team and the self-confidence of each of its members.

As a result, the team's chances of further positive actions in the course of the game, and, consequently, of winning the competition, are significantly increased [2, p. 116].

Conclusion. The prospects of the research consist in identifying new methods of forming the serving technique of young volleyball players, as well as in positive changes in existing methods. The article briefly outlined the important role of psychological factors that affect the serving technique of young volleyball players. Perhaps, in the future, it will be possible to study the psychological component of children's and youth volleyball in more detail, not only in the context of serving, but also in a broader aspect of the training and competitive activities of young volleyball players.

References

1. Godunova N. And. Improve the serve of young volleyball players. And. Godunova, V. B. Markina, I. B. Other matters Sirakovskaya//Innovative technology in sports games. Moscow, 2020. C. International cooperation 19-25.
2. Komarov T. attachment Train young volleyball players through mobile games/T. attachment Komarova B. Other matters Sports games in sports, entertainment, and physical activities Smolensk, 2021. C. International cooperation 115-118.
3. Peace K A. International cooperation Improve the efficiency of DC technology training. A. International cooperation Smirnov//Domestic volleyball development trends and innovations. Moscow, 2023. C. International cooperation 125-128.
4. Chen Yu Analysis of psychological factors affecting volleyball/Yuri serve efficiency. Chinese Youth Volleyball Shanghai, 2022. №2 (8). – C. International cooperation 122-125.
5. Zhang Wei Thoughts on cultivating young volleyball players' serving skills. Zhang//Sports, sports equipment and technology. Wenzhou, 2022. On the 17th, S. 190-192.
6. Chen B. Discuss the factors that affect volleyball skills. Practical suggestions for improving students' volleyball skills. Chen//Quality and Market. Hangzhou, 2020. Number 3, S. 67-69.

Development of ice hockey in Chengdu (China)

UDC 796.06

Yao Mingfeng
Russian university of sports «GTSOLIFK», Moscow

Corresponding author: ya.melnikova64@yandex.ru

Received by the editorial office on 21.04.2025

Abstract
This article analyzes the development of ice hockey in Chengdu. Chengdu is a strategic hub for the development of the western part of the People's Republic of China and an important gateway connecting China with the Middle East and Europe. The growing popularity of ice hockey in the region is linked to government support for the sport, as well as the development of economic ties with geographical neighbors.

Keywords: *China, Chengdu province, ice hockey, sports reserve training, Chengdu Hockey Club.*

Introduction. As part of the eleventh five-year economic and social development plan of the People's Republic of China, the number of sports arenas and stadiums was increased, which in turn contributed to the emergence of new hockey clubs, the level of competitiveness of players continued to increase, and enthusiasm for mass involvement in ice hockey continues to grow [2].

According to statistics, about 1 million people live in Chengdu every year, who visit various ice and snow sports grounds. The Chengdu Hockey Association represents more than 10 different ice and snow sports organizations, and about 200 ice and snow events of all levels are held annually under the leadership of the government and with the participation of the society [3].

Special achievements in this sport include: the development of the women's hockey team and the creation of the junior national ice hockey team.

Main part. This fact is inextricably linked to deep cultural foundations, strong political guarantees and continuous improvement of the construction of sports infrastructure. At the same time, Chengdu has a long history and culture, rapid economic development, and a relatively deep sports base. One of the most popular sports, before the mass development of ice hockey, was roller skating and inline hockey [4].

It should be noted that the Organizing Committee of the Games of the XXXIV Olympiad in 2028 in Los Angeles is actively working to include hockey on roller skates in the Program of the Games.

There are currently 6-7 land-based hockey clubs in Chengdu with over 300 members, and small clubs are popping up in an endless stream. There are 4-5 cities in Sichuan Province that have consistently launched ground ice hockey, which is developing rapidly. There are many roller skating enthusiasts in Sichuan Province, most of them are youth enthusiasts who have founded ice hockey for adults.

As part of the Peoples Republic China state policy, as well as the development strategy of the western region, Chengdu has become an important transport hub, which in turn has allowed a number of countries around the world, such as the Russian Federation, Finland, Canada, and the United States, to bring their own ice hockey culture [1].

The factors that determine the impact on the development of ice hockey in Chengdu include:

- Political guarantee for the development of ice hockey in the region;
- Development of hockey infrastructure in the region;
- Development of the women's ice hockey team;

• Development of youth ice hockey;

Conclusion. Thanks to the successful organization and holding of the XXIV Olympic Winter Games in 2022, the organization and holding of the upcoming XXXI World Summer University Games, as well as within the framework of the state program "300 million people are engaged in ice and snow sports", the number of ice and snow sports facilities in Chengdu continues to increase, a number of facilities are undergoing a rapid modernization process, which in In turn, it contributes to the dynamic development of ice hockey in the region.

Chengdu is expected to become one of the main ice hockey bases in the People's Republic of China in the near future.

References

1. The Main State Administration for Physical Culture and Sports: [Electronic resource] URL www.sport.gov.cn (accessed 03.12.2024)
2. State Committee for Development and Reform: [Electronic resource] URL www.sdpc.gov.cn (accessed 14.01.2025)
3. Li, Xin Han. Review, review and prospects of the 60-year history of ice hockey development in China/ Xinghan Li, Feng Wei // Journal of Harbin Institute of Physical Education. - 2013. – 31(05). pp. 22-25.
4. Li, Xue. The state of development of ice hockey in our country and measures to counter it / Xue Li, Peng Chenyi // Modern sports technologies – 2016. – 6(19). – Pp. 133-134.

The management of early childhood physical development centers at the regional level

UDC 796.06

Dr. Hab., Professor **L.A. Rapoport**
PhD, Associate Professor **S.V. Tomilova**
O.I. Prokhorova
A.S. Rapoport
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: rla66@mail.ru

Received by the editorial office on 21.12.2024

Abstract

Objective of the study was to pinpoint the unique features of the management of early childhood development centers in the Sverdlovsk region.

Methods and structure of the study. Theoretical and practical approaches are employed. The research is grounded in the analysis of the operations of the pilot project «Centers for Early Physical Development of Children» in the Sverdlovsk region, which was established in accordance with the order of the Ministry of Sports of Russia, dated November 30, 2022, No. 1119. Within the framework of the pilot project, in 2023, efforts were made to identify and select children with exceptional athletic abilities.

Results and conclusions. A plan has been created for the operation of early physical development centers for children, which includes: the creation of supplementary general development programs in the area of physical culture and sports; the training (re-training) of personnel to support the operations of early physical development centers; the preparation of legal regulations to determine the locations of study; and the establishment of state and municipal assignments.

Keywords: *early physical development centers, selection of sports-gifted children, additional general development programs, physical education and sports, regulatory and legal regulation.*

Introduction. The topic of development of children's and youth sports is included in the list of strategically important areas of the industry, which are given priority attention, starting with regulatory framework [1]. In this regard, we have determined the need to analyze the existing experience and determine the prospects for the activities of early physical development centers for children in the Sverdlovsk region. As part of the activities of the model site on the topic of «Early Physical Development Centers for Children» in 2023 and the work organized on it for the individual selection of gifted children, it became possible to identify mechanisms for attracting children to early physical development centers in the Sverdlovsk region.

Objective of the study was to pinpoint the unique features of the management of early childhood development centers in the Sverdlovsk region.

Methods and structure of the study. The study included an analysis of: regulatory and strategic documents at the federal and regional levels in the field of physical culture and sports; statistical materials on the results of testing children on the hardware and software complex «Become a Champion» (hereinafter referred to as the «Become a Champion» hardware and software complex), conducted as part of the activities of a model site based on two centers (the Regional Center for the Development of Physical Culture and Sports in Yekaterinburg and the Center for the Development of Physical Culture and Sports in Kamensk-Uralskiy) in 2023; feedback received from parents, who were given recommendations on choosing a sport for their children.

Results of the study and discussion. In accordance with the order of the Ministry of Sports of Russia dated November 30, 2022 No. 1119, the activities of a model site on the topic «Centers for early physical development of children» were organized in the Sverdlovsk region. The activities to create centers for early physical development in the Sverdlovsk region are organized in accordance with regulatory documents

at the federal level: subparagraph «b» of paragraph 4 of the List of instructions of the President of the Russian Federation dated October 7, 2021 No. Pr-1919 (to ensure legal regulation of the status and activities of centers for early physical development of children, paying particular attention to the organization of the activities of such centers in the systems of general education and additional education of children) [1]; subparagraph «k-2» of paragraph 1 of the List of instructions of the President of the Russian Federation dated March 27, 2019 No. Pr-759 (creation of centers for early physical development of children (starting from the age of two) [2]; subparagraph «a-9» of paragraph 2 of the List of instructions of the President of the Russian Federation following the meeting of the Council for the Development of Physical Culture and Sports dated October 30, 2020 No. Pr-1760 (increasing the number of centers for early physical development of children (starting from the age of two), including in preschool educational organizations) [3]; Federal Law dated December 4, 2007 No. 329-FZ «On Physical Culture and Sports in the Russian Federation»; Federal Law dated December 29, 2012 No. 273-FZ «On Education in the Russian Federation», etc.

As part of the activities of the model site based on two centers (Regional Center for the Development of Physical Culture and Sports in Yekaterinburg and the Center for the Development of Physical Culture and Sports of the City of Kamensk-Uralsky) in 2023, activities were organized for the individual selection of sports-gifted children using the hardware and software complex «Become a Champion». To organize this activity, at the initiative of the Ministry of Physical Culture and Sports of the Sverdlovsk Region, the work «Organization of work on the individual selection of sports-gifted children, including in relation to disabled children and persons with disabilities» was included in the regional list (classifier) of state (municipal) services and works.

The website of the Ministry of Physical Culture and Sports of the Sverdlovsk Region (the website audience is over 80 thousand people per month) contains information about testing on the «Become a Champion» APK. Registration for testing is carried out through the website and by phone at the organizations. Testing is carried out by qualified specialists (each center has two specialists) by appointment and includes four stages:

1) anthropometric examination (assessment of physical development; assessment of body composition, musculoskeletal system; determination of constitution and proportions);

2) functional examination (determination of propensity for physical activity; determination of the type of physical activity; assessment of lung capacity; blood pressure measurement);

3) psychophysiological examination (determination of the speed of sensorimotor reaction; assessment of control of voluntary movements; assessment of the properties of the nervous system: strength, mobility, balance);

4) sports testing (determination of strength, speed, coordination abilities; vestibular stability; determination of physical performance). Based on the testing results, a conclusion is issued with recommendations on the choice of sport, the results of the tests, including in the context of fulfilling the standards of the GTO Complex. Also, in the Regional Center for the Development of Physical Culture and Sports, parents are additionally given the opportunity to receive a consultation with a psychologist and a sports doctor based on the testing results. Over the entire period of using the «Become a Champion» APK, more than 800 children have been tested, including more than 340 people in 2024. The «Become a Champion» APK issues recommendations for practicing 52 sports. The results obtained showed that the leading place in terms of the presence of a tendency (good and best degree) to practice among sports is occupied by combat sports and complex coordination sports: about 24% and 22%, respectively.

According to the results of testing for the entire period of training in martial arts (priority – wushu and karate) as the most preferred sports are recommended by 23% of those tested in Yekaterinburg and 26% in Kamensk-Uralskiy; training in complex coordination sports (dance sport and acrobatic rock and roll prevail in the recommendations) are preferred by 21% of those tested in Yekaterinburg and 23% in Kamensk-Uralskiy.

A tendency to engage in cyclic sports was revealed in 22% of children who were tested. At the same time, the share of these recommendations in the city of Yekaterinburg is higher than in Kamensk-Uralskiy (22% and 21%, respectively).

Recommendations for choosing team sports as the most preferred make up an insignificant part, their total weight is about 10% (11% in the city of Yekaterinburg and 8% in Kamensk-Uralskiy). It should be noted separately that about 6% of children who passed the test were recommended to take general physical training classes due to weak indicators of physical development. It is noteworthy that in the city of Yekaterin-

burg this figure is lower than in Kamensk-Uralskiy (3% and 10%, respectively).

Based on the results of testing, feedback was received from the parents of children who passed the test: more than 70% of those tested who received recommendations on choosing a sport began classes in sports schools according to sports training programs for the recommended sports. At the same time, the share of those who began in the region is slightly higher than in the regional center (75% and 70%, respectively). In Yekaterinburg, there are 30 organizations implementing additional educational programs for sports training, and in the city of Kamensk-Uralskiy – 3. One of the reasons for the lower percentage in Yekaterinburg may be the presence of an extensive network of organizations providing services for sports, including on a paid basis. The development of promising areas of activity for early physical development centers for children was carried out in accordance with the regulatory framework on this issue.

Article 84 of Federal Law 273-FZ «On Education in the Russian Federation» defines the main activity of early physical development centers for children as the implementation of preschool education programs and additional general development programs in the field of physical education and sports, which determines the interdepartmental and intersectoral nature of the activity «education – physical education and sports». At the same time, Order No. 986 of the Ministry of Sports of the Russian Federation dated 04.10.2024 «On approval of the specifics of the activities of early physical development centers» provides for the need to assess children's abilities to engage in relevant sports, including using the hardware and software complex «Become a Champion». Also, paragraph 4.6. The methodological recommendations for the development of sports with low-cost sports equipment, sports inventory and equipment, operation of sports facilities and sports structures, approved by the Minister of Sports of the Russian Federation, recommend providing for a state (municipal) assignment for additional general development programs in the field of physical education and sports in state and municipal organizations implementing additional educational programs for sports training. In this regard, in accordance with the requirements of the current legislation, a roadmap has been developed in the Sverdlovsk Region for organizing the activities of early physical development centers for children, providing for: development of additional general development programs in the field of physical education and sports; organization of training (retraining) of personnel to ensure the activities of early physical development centers; preparation of regulatory legal acts on determining places of training; formation of a state and municipal assignment.

Conclusions. In order to achieve maximum coverage of children by the activities of the early development center in the Sverdlovsk region, it is proposed to:

- supplement the statutory types of activities of state organizations implementing additional educational programs for sports training with activities to implement additional general development programs in the field of physical education and sports and determine the corresponding state assignment for these organizations;

- organize similar work on the basis of municipal organizations implementing additional educational programs for sports training with the formation of a corresponding municipal assignment;

- work out the issue of gradually equipping 100% of municipalities located in the Sverdlovsk region with the hardware and software complex «Become a Champion» (73 municipalities). A relevant mechanism for solving this problem is the use of the existing network of GTO Complex testing centers in the region (84 GTO Complex testing centers in all municipalities);

- organize work on amending the state and municipal programs for the development of physical education and sports.

References

1. Porucheniya Prezidenta RF po itogam zasedaniya Soveta po razvitiyu fizicheskoy kultury i sporta: Perechen porucheniy ot 7 oktyabrya 2021 g. № Pr-1919. Garant.ru: sayt [Garant.ru: website]. Available at: https://www.garant.ru/products/ipo/prime/doc/402804325/ (date of access: 07.09.2024).
2. Porucheniya Prezidenta RF po itogam zasedaniya Soveta po razvitiyu fizicheskoy kultury i sporta: Perechen porucheniy ot 27 marta 2019 g. № Pr-759. Prezident Rossii: sayt [President of Russia: website]. Available at: http://www.kremlin.ru/acts/assignments/orders/60467 (date of access: 08.01.2025).
3. Porucheniya Prezidenta RF po itogam zasedaniya Soveta po razvitiyu fizicheskoy kultury i sporta: Perechen porucheniy ot 30 oktyabrya 2020 g. № Pr-1760. Prezident Rossii: sayt [President of Russia: website]. Available at: http://www.kremlin.ru/acts/assignments/orders/64309 (date of access: 08.01.2025).

The impact of swimming with traditional fins on the advancement of underwater sports in the region

UDC 612.087

Professor **I.A. Tolstopyatov**
Associate Professor **E.V. Redi**
A.N. Lisovik
Reshetnev Siberian State University of Science and Technology, Krasnoyarsk

Corresponding author: Russlen90@mail.ru

Received by the editorial office on 25.11.2024

Abstract

Objective of the study was to assess the influence of the advancement of the discipline of swimming with traditional fins on the growth of underwater sports in the Krasnoyarsk region.

Methods and structure of the study. The examination of information from literary sources and methodological materials on underwater sports is conducted. Additionally, an analysis of the performance of athletes from the Krasnoyarsk Region in the period between 2021 and 2023 was performed.

Results and conclusions. Since 2006, the sport of swimming with traditional fins has been incorporated into the program of scuba diving competitions. This was done to encourage athletes to engage in scuba diving and to expand the participation of countries in international competitions.

It has been observed that in the past decade, there has been a substantial rise in the number of competitors in both Russia and abroad.

A comparative study of the performance of athletes in the Krasnoyarsk Territory has revealed that the number of athletes participating in underwater sports has remained relatively stable over the past three years. The results of swimmers in the monolayer discipline have declined significantly over the past six years. Conversely, the results in swimming with classical fins have improved over the same period. Examining the evolution of underwater sports in the Krasnoyarsk Territory, it is evident that swimming with classical fins has contributed to the advancement of underwater sports in the region. However, coaches and the management of sports clubs should prioritize the disciplines of monolayer swimming, as there has been a noticeable decline in performance in these areas.

Keywords: *scuba divers, underwater sports, medal standings, competitions, swimming in classical fins, swimming in fins.*

Introduction. Underwater swimming is a rapidly developing sport. The basis of underwater swimming is the athlete's immersion and swimming on the surface of the water for a certain period of time using a monofin. Also, underwater sports are characterized by descents under water using special equipment, tools, apparatus and gear [1, 2]. In 2006, the discipline of swimming with classic fins was included in the program of underwater sports. Swimming with classic fins is a type of swimming on the stomach, in which the strokes of the left and right sides of the body alternate. Each arm makes a wide swing along the axis of the swimmer's body, during which the legs, in turn, also rise and fall alternately. The athlete's face is in the water. The athlete breathes through a snorkel, and separate fins are put on the legs.

Objective of the study was to assess the influence of the advancement of the discipline of swimming with traditional fins on the evolution of underwater sports at the local level.

Methods and structure of the study. The examination of information from literary sources and methodological materials on underwater sports is conducted. Additionally, an analysis of the performance of athletes from the Krasnoyarsk Region in the period between 2021 and 2023 was performed.

Results of the study and discussion. Underwater swimming is a dynamically developing sport. To date, underwater sports are not included in the Olympic Games program. However, the World Underwater Activities Confederation (CMAS) is recognized by the International Olympic Committee (1986). In recent years, CMAS has made a lot of efforts to include finswimming in the Olympic Games program. In 2013, at the World University Games in Kazan, finswimming was presented as a demonstration program. Since 2014, International Student Finswimming Competitions have been held annually. In 2015, finswimming was also presented at the European Games in Baku as a demonstration program [3]. One of the most important steps in the development of underwater sports was the introduction of classic finswimming into the competition program in 2006. This allowed many athletes involved in regular swimming to take part in underwater sports competitions, which immediately affected the level of training. Considering that the level of development of underwater sports in the Krasnoyarsk Territory has not yet been studied, we conducted a comparative analysis of the generalized data obtained when studying the dynamics of the number of athletes involved in underwater sports for the period 2021-2023 (Figure 1) and the overall medal count at the Russian Championship in different years (Figure 2, 3, 4).

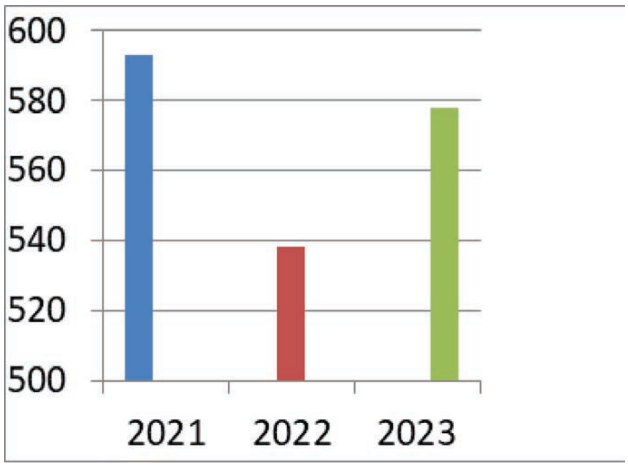


Figure 1. Number of athletes involved in underwater sports at different times

In 2021, the number of athletes involved in underwater sports in the Krasnoyarsk Territory was 593 people, in 2022 – 538 people, in 2023 – 578 people.

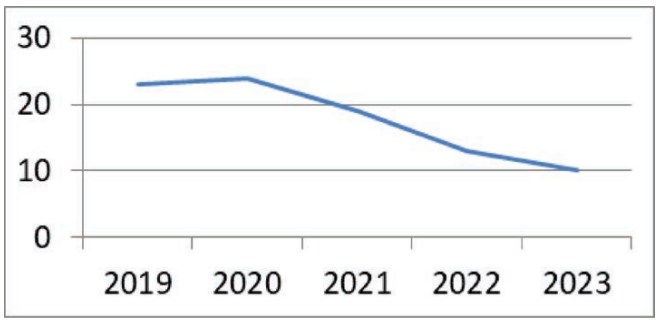


Figure 2. The number of medals won by the Krasnoyarsk Territory team in different periods of time

The number of medals won by the Krasnoyarsk Territory underwater sports team in 2019 was 23, in 2020 – 24 medals, in 2021 – 19 medals, in 2022 – 13 medals, in 2023 – 10 medals.

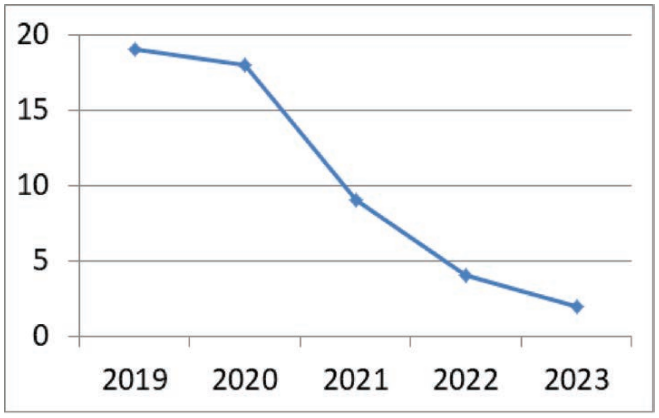


Figure 3. The number of medals won by the Krasnoyarsk Territory national team in the finswimming discipline for different periods of time

The number of medals won by the Krasnoyarsk Territory national team in the discipline of finswimming (swimming with monofins) in 2019 was 19, in 2020 – 18 medals, in 2021 – nine medals, in 2022 – four medals, in 2023 – two medals.

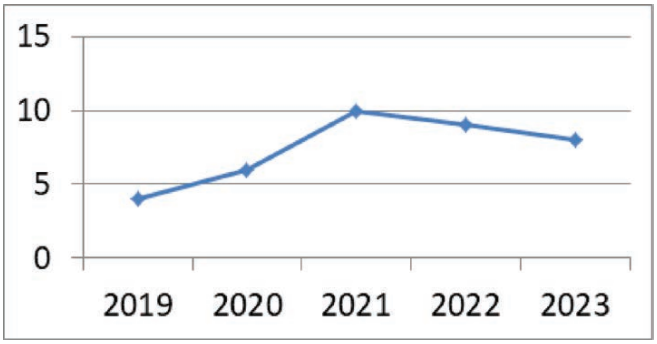


Figure 4. The number of medals won by the Krasnoyarsk Territory national team in the finswimming discipline for different periods of time

The number of medals won by the Krasnoyarsk Territory team in classic finswimming in 2019 was four, in 2020 – six medals, in 2021 – 10 medals, in 2022 – nine medals, in 2023 – eight medals.

Based on the results of the study, it can be concluded that the number of athletes involved in underwater sports in 2021 is greater than in 2023. The total number of medals of the 2020 Russian Championship is significantly higher than in 2022 and 2023. The largest number of medals of the Russian Championship in monofin swimming disciplines were awarded in 2019 and 2020. However, the level of classic fin swimming in the Krasnoyarsk Territory has increased significantly in recent years, with the highest medal counts in 2022 and 2023.

Conclusions. The growth of achievements in underwater sports is largely determined by the constant improvement of methods for training qualified athletes. However, new disciplines introduced in 2006 into the competitive program for underwater sports have made their own adjustments. The total number of participants, regions, and countries has undoubtedly increased. However, the results of monofin swimming in some regions have significantly decreased.

A comparative analysis of the competitive activity of athletes in Krasnoyarsk Krai showed that the number of athletes involved in underwater sports has remained virtually unchanged over the past three years. The results of divers competing in the discipline with a monofin have significantly decreased over the past six years. At the same time, the results in classic fin swimming, on the contrary, have increased over the past six years.

If we look at the development of underwater sports in Krasnoyarsk Krai as a whole, we can say that classic fin swimming has had a positive impact on the development of underwater sports in this region. However, coaches and management of sports clubs should pay more attention to monofin swimming disciplines, since a significant decrease in results is observed in these disciplines.

References

1. Andreeva A.I., Martynov A.I., Pavlov V.I. et al. Podvodnyy sport i zdorovye. Monograph. Moscow: DOSAAF SSSR publ., 1980. 222 p.
2. Moskovchenko O.N., Tolstopyatov I.A., Aleksandrov A.V. Podvodnyy sport i dayving. Study guide. Dictionary-reference book. 2nd ed., rev., sup. Krasnoyarskiy gosudarstvennyy pedagogicheskiy universitet im. V.P. Astafyeva, publ. Krasnoyarsk, 2014. 316 p.
3. Redi E.V., Grinko A.L., Faleeva E.A. Podvodnyy sport. Study guide. Sibirskiy gosudarstvennyy universitet im. M.F. Reshetneva, publ. Krasnoyarsk, 2021. 88 p.

A technique for improving the mental well-being of individuals with disabilities through aquatic-based physical therapy

UDC 159.942.072.432/433

Dr. Hab., Professor **S.V. Novakovskiy**[1]
Dr. Hab., Professor **E. Machaidze**[2]
S.V. Kondratovich[1]
A.A. Taranchuk[1]
[1]Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg
[2]Georgian State Pedagogical University of Physical Education and Sports, Tbilisi

Corresponding author: s.v.novakovskiy@urfu.ru

Received by the editorial office on 20.01.2025

Abstract

Objective of the study was to evaluate the impact of aquatic-based therapy on the mental well-being of individuals with disabilities.

Methods and structure of the study. The study involved 19 participants ranging in age from 5 to 18 years, with diverse health conditions. The research focuses on the design of classes in a water-based environment for individuals with disabilities. A novel approach has been implemented to evaluate alterations in the psychological and emotional activity of individuals with disabilities: assessing their general psychological and emotional state through psychodiagnostic techniques, monitoring their physiological indicators, and examining their capacity for consciously regulating these indicators during BOS procedures.

Results and conclusions. The experiment demonstrated that the techniques and tools employed in water-based physical therapy classes should not only aim to enhance physical development indicators, but also to foster the development of cognitive, motivational, regulatory, communicative, and emotional aspects in children with disabilities. The findings underscore the significance of implementing the proposed approach for assessing the psychological and emotional well-being of children with disabilities, allowing for a comprehensive evaluation of the changes in their emotional and motor activity.

Keywords: *body-oriented therapy, hydro-rehabilitation, psycho-emotional state, limitations in health, adaptive physical culture.*

Introduction. Modern rapid changes in the socio-economic life of Russia, the aggravation of many social problems, dictate the need to find new, adequate to reality, mechanisms for social rehabilitation of the individual. In this regard, special attention is required by children with disabilities (hereinafter –ChD). Recognition of the rights of such a child, his needs, interests, provision of effective assistance in the process of personal development, are extremely important.

Children with disabilities are individuals under 18 years of age (not yet of age), who have deviations from the norm in physical or mental development due to a health disorder, characterized by a complete or partial loss of the ability or opportunity to provide self-service [2].

The main task of rehabilitation of children with disabilities is the development of their potential, behavior correction, expansion of social horizons, instillation of socially significant skills and abilities [1]. In our opinion, it is advisable to seek a solution to the problem of comprehensive rehabilitation of children with disabilities in the involvement of new methods of body-oriented therapy. One of the promising areas that has a targeted effect on the impaired functions of the body, correcting and compensating them with the help of existing rehabilitation areas is water-based body-oriented therapy.

Specialists in various fields of scientific knowledge - psychologists, philosophers, teachers, sociologists and other specialists study the mechanisms, stages and phases, factors of social rehabilitation of children with disabilities. Thus, the problems of children with disabilities are studied by L.I. Akatov, G.I. Deryabina,

T.S. Zubkova, N.V. Timoshina, E.I. Kholostova [4]. The main areas of socialization are reflected in the works of Ya.A. Kravchenko, K.K. Cherdonova [9, 10]. Issues of prevention and education are addressed in the works of N.V. Antonova, M.A. Belyaeva, E.V. Bedeeva, Yu.V. Vasilkova [2]. The medical aspect of rehabilitation is studied by I.V. Astrakhancev, V.M. Bogomolova, M.V. Elshtein, A.M. Zotova, A.V. Fedorov [3]. The methods of body-oriented psychotherapy in psychology, laid down by V. Reich, indicate the potential for their use in working with children with health problems [5, 7]. An analysis of theoretical sources revealed that most of the studies devoted to assessing the psycho-emotional state of children with disabilities during body-oriented therapy pay attention to the development of new methods. At the same time, an insufficient number of studies were found that would analyze the psycho-emotional state of children with disabilities under the influence of water body-oriented therapy.

Objective of the study was to evaluate the impact of aquatic-based therapy on the mental well-being of individuals with disabilities.

Methods and structure of the study. The experiment involved 19 children aged 5 to 18 years with different nosologies with the conclusion of informed consent from their parents. Classes in «Akvaskazka» in Yekaterinburg are held both individually and in small groups. Their peculiarity lies not only in the constant water temperature of 33 degrees, but also in the fact that the child's parents can be in the water together with the instructor. Since the children come in advance to prepare for the lesson, it was suggested to occupy their free time while waiting in an unusual way for them – by participating in interactions using biofeedback training and psychological projective techniques that allow assessing the level of influence of water body-oriented therapy on the psycho-emotional state of children. To obtain complete objective information about the characteristics of the psycho-emotional state of children, testing was carried out both before the start of the lesson and after the lesson. In accordance with the purpose of the study, the following psychological methods and trainings were used with the use of the biofeedback method of software devices:

1. Modified test of M. Luscher, aimed at measuring the psychophysiological state of children.

2. Modified test «Cactus» to identify the state of the emotional sphere.

3. Software and hardware complex «BOS-TEST – Professional» and professional complex Brain Bit Neurofit for psychoemotional correction based on the BOS method.

A short version of the color test of M. Luscher consists of eight color tables. The procedure itself consists of ordering colors by the subjects according to their degree of subjective pleasantness. Since the choice of color is based on unconscious processes, it indicates not how we imagine ourselves, but what we really are [6]. In our testing, a modified test of M. Luscher was used. In accordance with the water-based body-oriented therapy, a picture of bathing children was used for greater association with the upcoming lesson. One of the eight colors of the M. Luscher method is superimposed on top.

The method developed by M.A. Panfilova [8] is aimed at identifying the characteristics of psycho-emotional manifestations and determining stress resistance. Analysis of the obtained data allows diagnosing personality traits: the degree of aggressiveness, impulsiveness, anxiety, extroversion/introversion. The interpretation of the color scheme indicates how flexible the test subject's psyche is. The study used various drawing templates, since not every participant in the experiment could draw a cactus on their own. Testing was conducted after swimming lessons so that the children could fully immerse themselves in completing the task without time limits.

One of the reliable methods for diagnosing stress resistance is the technology of game computer biocontrol. The game competitive plot is controlled by physiological functions, indicating the ability to self-regulate. As a result of automatic diagnostics of self-regulation strategies, the P indicator is calculated, reflecting the prevalence of effective/ineffective or intermediate self-regulation strategies of the test subject, presented on the efficiency matrix in the appropriate color. Interpretation is carried out according to the types of self-regulation corresponding to the maximum probabilities. Thus, the BFB method, supported by gaming and multimedia techniques, is a «Physiological Mirror» reflecting the processes occurring in the body.

Results of the study and discussion. The analysis of the obtained results corresponded to the purpose of the study – to assess the degree of influence of water body-oriented therapy on the psycho-emotional state of children with disabilities. Since, due to various reasons related to deviations in health, children cannot always attend classes, the indicators of 13 experiment participants who were present at all

stages of testing were taken into account for the analysis. The procedure for studying color associations made it possible to identify the comfort or tension of the state before and after the lesson. Thus, 62% (eight people) of the experiment participants had alertness, anxiety, fussiness, and increased sensitivity before the lesson. After the lesson in the pool, the identified indicators tended to decrease. Residual states were observed only in 23% (three people). Color preferences were replaced by expression of interest, openness to communication, and demonstration of volitional qualities. As a result of these regulated indicators in the process of passing biofeedback trainings before and after classes, the majority of the test subjects (69%, nine people) showed the result corresponding to the manifestation of an intermediate self-regulation strategy. This leads to the conclusion about moderate tension of regulatory systems - a state of tension of adaptation mechanisms with a tendency to increase the activity of stress-realizing systems. A decrease in physical stressors was also noted.

Conclusions. The conducted experiment confirmed that the methods and means used in water body-oriented therapy classes should be oriented not only to the growth of physical development indicators, but also to the formation of cognitive, motivational, regulatory, communicative and emotional components in the development of children with disabilities. The results of the study emphasize the importance of using the proposed method to assess the psycho-emotional state of children with disabilities, which made it possible to fully consider and evaluate the change in the emotional and motor activity of the child.

References

1. Azarova L.N. Telesno-oriyentirovannyy podkhod v rabote s giperaktivnymi detmi. Obucheniye i vospitaniye: metodiki i praktika. 2015. No. 20.
2. Bedeeva E.V Osnovnyye sredstva profilaktiki i korrektsii psikhoemotsionalnogo napryazheniya u detey s OVZ. Novaya nauka: psikhologo-pedagogicheskiy podkhod. 2017. No. 2. pp. 23-27.
3. Berezkina-Orlova V.B. Telesnaya psikhoterapiya. Biodinamika. Study guide. Moscow: AST publ., 2010. 409 p.
4. Deryabina G.I. Primeneniye kreativnykh telesno oriyentirovannykh praktik v komplekse s fizkulturno-korrektsionnoy deyatelnostyu s invalidami, imeyushchimi posledstviya detskogo tserebralnogo paralicha. Gumanitarnyye nauki. Pedagogika i psikhologiya. 2012. No. 12. pp. 443-449.
5. Sergeevich A.A. Klassifikatsiya metodov telesno oriyentirovannoy terapii. Problemy sovremennogo pedagogicheskogo obrazovaniya. 2022. No. 74. pp. 252-255.
6. Sobchik L.N. Metod tsvetovykh vyborov – modifikatsiya vosmitsvetovogo testa Lyushera. Practical guide. St. Petersburg: Rech publ., 2012. 128 p.
7. Malkina-Pykh I.G. Telesnaya terapiya. Handbook of a practical psychologist. Moscow: Eksmo publ. 2015. 960 p.
8. Panfilova M.A. «Kaktus». Graficheskaya metodika. Available at: http://www.psy-files.ru/2007/06/14/kaktus.html
9. Rybachenko A.B., Barba M.F., Kravchenko M.I. Telesno-oriyentirovannyye praktiki v rabote s detmi. Metod zameshchayushchego ontogeneza. Voprosy doshkolnoy pedagogiki. 2015. No. 3. pp. 99-101.
10. Cherdonova V.A., Igumnova A.S. Akvaterapiya kak igrovaya tekhnologiya v korrektsionno-razvivayushchey rabote pedagoga psikhologa s detmi s OVZ. Aktualnyye problemy nauki i obrazovaniya v usloviyakh sovremennykh vyzovov. Proceedings of the 11th International scientific-practical conference. Blagoveshchensk, February 20, 2018. Blagoveshchensk: Dalnevostochnogo GAU, publ. 2023. Vol. 2. No. 11. pp. 77-82.

Results of a sociological survey of parents of children with mental disabilities on the social effect of the project «Inclusive sports for all» of the special Olympics Russia

UDC 796

PhD, Associate Professor **E.V. Burtseva**[1],
PhD, Associate Professor **L.A. Parfenova**[1]
PhD, of cultural Associate Professor **M.S. Rakova**[1, 2]
[1]Volga region state university of physical education, sports and tourism, Kazan
[2]Special Olympics Russia, Moscow

Corresponding author: volder1968@mail.ru

Received by the editorial office on 03.03.2025

Abstract

Purpose of the study. To identify the social effects of the project “Inclusive Sports for All”, implemented by the Special Olympics Russia based on the results of a sociological survey of parents.

Methodology and organization of the research. As part of the sociological study, a survey was conducted of the main social customer of the project - parents (743 respondents) and guardians of athletes (100 respondents) with mental disabilities in the Ivanovo, Kostroma and Sverdlovsk regions, the Republic of Tatarstan, and Moscow. The study did not aim to diagnose changes in the physical condition of children, but first of all, the assessment of the Project by the main social customer - parents of children with mental disabilities was important to us.

Research results and conclusions. Classes under the Inclusive Sports for All program had a huge impact on the child's development in three areas: physical, personal and social. We proposed a set of measures for the further development of the inclusive sports model: 1) Developing a system of meanings for the parents of partners, disseminating key messages among them explaining the essence and social effects of their children's participation in inclusion; 2) Developing support measures for coaches working with children with mental disabilities; 3) Implementing individual elements of a person-oriented approach for all inclusion participants.

Keywords: *model of inclusiveness, people with disabilities, mental disorders, the project "Inclusive Sports for All", effects of the project implementation, Special Olympics Russia.*

Relevance. Today, the state and society have become the guarantor of social support for people with disabilities, taking on the responsibility for creating conditions for their full life, education, family well-being, development of individual and personal potential, professional training and adaptation to public life. The well-being of a child with disabilities in the family has a huge impact on his development. Under the general name "family of a child with disabilities" are united families with different educational potential and performing various functions in the field of family education of children from 0 to 18 years old with deviations in physical and (or) mental development [2].

Modern approaches to social rehabilitation involve the formation of a tolerant attitude towards vulnerable categories of citizens within the framework of various social institutions, organizations and long-term programs. The changes have led to increased inclusion and regulatory support for its development in many areas of life, stimulating the development of public relations, expressed in the emergence of new forms and directions of social policy concerning the integration, rehabilitation and support of special people [3, 4].

The need to institutionalize inclusion, the transition from informal interactions and unorganized activities to the creation of organizational hierarchies and regulation of relevant work, as well as the legal registration of inclusive processes, has set the task of technological support for changes before science and practice. This includes the development and implementation of

modern technologies and mechanisms for interaction between all interested parties [2].

In this context, it is necessary to recognize the enormous socio-cultural potential of physical education and sports activities, which, by their nature, are designed to compensate for the missing conditions for the personal development of individuals with disabilities, to create additional space for their creative self-realization and self-expression, and to help them solve current life problems.

In this direction, the leading role was taken by Special Olympics Russia, which designated the creation of an inclusive environment and the formation of an inclusive culture in society as the main priorities of its activities. Systematically moving towards the set goal, the movement has already adapted a significant part of the proposed social and sports programs to the requests and needs of its participants, offering inclusive formats for their implementation [1].

Special Olympics Russia, with the support of the Vladimir Potanin Charitable Foundation, is implementing the Inclusive Sports for All Project in 15 regions, aimed at promoting the values and approaches of social inclusion through sporting events with the joint participation of amateur athletes (partners) and participants with mental disabilities (athletes).

Purpose of the study: identifying the social effects of the project “Inclusive Sports for All”, implemented by the Special Olympics Russia based on the results of a sociological survey of parents.

Methodology and organization of the research. As part of the sociological study, a survey was conducted of the main social customer of the project - parents (743 respondents) and guardians of athletes (100 respondents) with mental disabilities in the Ivanovo, Kostroma and Sverdlovsk regions, the Republic of Tatarstan, and Moscow. The study did not aim to diagnose changes in the physical condition of children, but first of all, the assessment of the Project by the main social customer - parents of children with mental disabilities was important to us.

Research results and their discussion. Based on the survey results, three groups of effects of the project implementation were identified:

- physical and spatial (improving physical condition, coordination, increasing freedom of movement);
- personal (increasing self-esteem);
- social (improving communication and social skills).

A survey of athletes' parents showed that sport is the most common additional activity in the lives of participants - children with mental disabilities.

Russian society is accustomed to children being surrounded by attention and immersed in numerous activities. However, as the study showed, the life of children with mental disabilities is rather poor, and most of them do not engage in any additional activities by default. The high involvement of the surveyed children in sports, as will be shown below, is the result of the implementation of the project "Inclusive Sports for All".

It is noteworthy that the involvement of children in sports is not 100%, but 85%, although only parents of children participating in the project "Inclusive Sports for All" took part in the survey. 15% are spectators who attend competitions but do not take part in training. And some of them, as shown by the analysis of the answers to open questions, do play sports as part of the program, but parents simply do not associate these activities with sports training.

As the survey showed, in the lives of a significant number of children, although not the majority (41%) of children with mental disabilities - participants in the project - sport first appeared with the project "Inclusive Sport for All".

Thus, the project fulfills an important social function of introducing children to sports, and directly to classes in equipped halls with professional trainers, bypassing the “yard” level, which is inaccessible for most children with mental disabilities.

Analysis of the answers to the question: "What are the main changes in your child's condition over the past year thanks to inclusive training and competitions under the Special Olympics Russia programs?" the majority of parents answered - "Health and physical condition" (more than 400 answers), in second place - "Social relationships and skills" (more than 300 answers) and third place is - the child's personal sphere (more than 250 answers).

In response to an open question about the impact of the Inclusive Sports for All project on a child, the most popular options were: “Runs faster, jumps better”; “Gets sick less”; “Started communicating with other children”; “Strives to achieve results”; “Started to control himself”.

In general, the parents’ responses are optimistic, which, in our opinion, is connected with the real positive changes that have occurred in their child during

the year of participation in the “Inclusive Sports for All” project.

Among the factors of changes in the condition of their child, identified by respondents, sport is the leader in all parameters. This is due to the fact that only those areas of manifestation of changes were selected for the survey, where sport is the leading factor of influence. It is possible that other changes occurred with the child during the period under study, caused by other reasons, but this study is not aimed at monitoring the condition of children, but at identifying the results of the implementation of a specific project.

A factor comparable in importance to sports has been identified – joint leisure time with parents; in other areas its influence may be stronger.

Thus, inclusive sports activities made a significant, and in some cases decisive, contribution to the child’s development in three areas. It is appropriate to consider the effects of the project in each of them.

Parents value the contribution of inclusive sports to the dynamics of their child’s physical condition most highly.

• 89% reported that the child’s physical condition improved over the year, 71% noted that inclusive sports classes influenced the improvement of physical condition.

• An improvement in five basic physical abilities is also noted, with flexibility being named the least confidently (61%), and endurance being the most confidently named (80%).

• The project contributed to the growth of children's spatial freedom. 71% of parents noted that their children began to spend more time outside the home, 69% reported that sports influenced this. It can be said that children began to leave their homes more often. Thus, Thus, the training hall within the framework of the project “Inclusive Sports for All” is a new significant place in the life of a child.

The contribution of the program to improving social relationships, according to parents, is very high, but less than to physical condition.

• 88% of parents report improved relationships between children and other people, but only 55% acknowledge the contribution of inclusive sports.

• The impact of the project on the development of social skills is not considered to be so significant - 86% of parents noted an improvement in communication skills, and 39% noted the contribution of inclusive sports.

• Thanks to the project, the children's social circle has expanded significantly. Many of them have made new adult acquaintances (79% noted an increase in the number of contacts with adults, the contribution of inclusive sports is 51%), to which the overwhelming majority of parents have a positive attitude (94%). 70% of new adults in the children's lives are coaches, project volunteers and employees of the Special Olympics Russia.

The contribution of inclusive sports to changes in the personal sphere is assessed by parents as high, but significantly lower than in other spheres. Perhaps, changes in it as a whole are more significantly influenced by the maturation of the child.

• 87% of parents noted an improvement in the psychological state of athletes, 50% reported that sport influenced the improvement.

• 82% observe an increase in children’s self-esteem, with inclusive sports contributing in 45% of cases.

• The range of interests expanded for 83% of children, the contribution of inclusive sports was 36%, which means that inclusive sports are of significant, but not the main importance in the lives of most athletes.

In addition to assessing the changes in children's lives associated with the project, changes in the lives of the parents themselves were identified, according to their own opinion.

• Children's successes inspire parents, 90% of respondents reported that they feel proud that their child takes part in inclusive training and competitions;

• there is an impact on personal life - 64% of respondents reported an improvement in family relationships over the year, 68% noted the impact of inclusive sports that the child is involved in;

• The project had a dual effect on parents' time budget - 43% had more free time, 36% - less. There are probably two strategies for participating in the project: an active one, in which the parent plays an active role, and the "give the child up and forget" strategy.

The disadvantages and negative effects of the project occupy a minor place, but negative aspects are noted for each research question.

Conclusion. Thus, the classes under the Inclusive Sports for All program had a huge impact on the child's development in three areas: physical, personal and social. We have proposed a set of measures for the further development of the inclusiveness model in sports: 1) Developing a system of meanings for

the parents of partners, disseminating key messages among them explaining the essence and social effects of their children's participation in inclusion; 2) Developing measures to support coaches working with children with mental disabilities; 3) Implementing individual elements of a person-oriented approach for all participants in inclusion.

References

1. Lebedev, E.V., Parfenova L.A. The Role of Special Olympics in Training Personnel for the Rehabilitation of Persons with Intellectual Disabilities - Physical Culture: Upbringing, Education, Training. 2022. No. 6. P. 66-68.
2. Parfenova, L.A., Gerasimov E.A. Inclusive technologies of physical education and sports activities of students with intellectual disabilities - Teoriya i praktika fizicheskoy kultury. 2019. No. 1. P. 13.
3. Parfenova, L.A., Lebedev E.V., Tsukhlov N.A. Concept of the educational strategy of the Special Olympics of Russia - Teoriya i praktika fizicheskoy kultury. 2022. No. 2. P. 85.
4. Petrova, E.A., Kozyakov R.V., Potashova I.I. Modern technologies of work with families with children with disabilities - Collection of materials of the Annual international scientific and practical conference "Education and training of young children". 2016. No. 5. URL: https://cyberleninka.ru/article/n/sovremennye-tehnologii-raboty-s-semyami-imeyuschimi-detey-s-ogranichennymi-vozmozhnostyami-zdorovya (date of access: 10.02.2025).

The psychological and physiological preparation of elite freestyle wrestlers

UDC 796.82

PhD, Associate Professor **V.A. Kuvanov**[1]
PhD, Associate Professor **S.P. Mikhaylovskiy**[1]
A.V. Zaytsev[1]
M.V. Davydov[2]
[1]Saint-Petersburg Mining University of Empress Catherine II, St. Petersburg
[2]Baltic State Technical University "VOENMEH" named after D.F. Ustinov, St. Petersburg

Corresponding author: gena391@mail.ru

Received by the editorial office on 11 .01.2025

Abstract

Objective of the study was to examination of the impact of ideomotor exercises on the performance of highly skilled freestyle wrestlers in competition.

Methods and structure of the study. The study involved the analysis and synthesis of literary sources, conducting a pedagogical experiment, conducting psychophysiological tests, and applying mathematical statistical methods. The research was conducted in the comprehensive school of high sports skills of St. Petersburg. The participants were wrestlers aged between 16 and 29. The group consisted of 34 freestyle wrestlers with varying levels of training. The wrestlers were divided into two groups. The first group included highly skilled athletes, such as candidates and masters of sports (16 individuals), while the second group consisted of wrestlers with II and III categories (18 individuals). In the second and third stages, the skilled wrestlers were divided into two groups: a control group and an experimental group. The psychophysiological characteristics were examined through tests. The study was based on the methodology of test control, which included tapping tests (E.P. Ilyin, 1983), reflexometry, and tremometry.

Results and conclusions. The application of the experimental approach yielded the following outcomes:

1. The wrestlers in the experimental group demonstrated significant improvements in two out of the three psychophysiological characteristics.
2. The study revealed a correlation between psychophysiological characteristics and the level of psychological and physical strain during training.
3. A method for enhancing the psychophysiological characteristics of athletes was developed.

Keywords: *wrestling, freestyle wrestling, ideomotor training, highly skilled wrestlers.*

Introduction. The high level of competition at major tournaments necessitates the improvement of the means and methods not only of comprehensive physical fitness, but also of the psychophysiological and psychological characteristics of athletes [5]. The problem of managing the psychophysiology of athletes affects various aspects of the training process – technical, tactical, physical, psychological, theoretical [1, 4]. Improving the psychophysiological characteristics of the strongest athletes, including with the help of the ideomotor training method, involves, firstly, finding relationships between various psychophysiological indicators that are important for successful performance in important competitions and, secondly, optimizing those that directly affect the success of the performance [2, 3, 6].

Objective of the study was to examination of the impact of ideomotor exercises on the performance of highly skilled freestyle wrestlers in competition.

Methods and structure of the study. The study involved the analysis and synthesis of literary sources, conducting a pedagogical experiment, conducting psychophysiological tests, and applying mathematical statistical methods. The research was conducted in the comprehensive school of high sports skills of St. Petersburg. The participants were wrestlers aged between 16 and 29. The group consisted of 34 freestyle wrestlers with varying levels of training. The wrestlers were divided into two groups. The first group included highly skilled athletes, such as candidates and masters of sports (16 individuals), while the second group consisted of wrestlers with II and III categories (18 in-

dividuals). In the second and third stages, the skilled wrestlers were divided into two groups: a control group and an experimental group. The psychophysiological characteristics were examined through tests. The study was based on the methodology of test control, which included tapping tests (E.P. Ilyin, 1983), reflexometry, and tremometry.

Results of the study and discussion. In order to find and determine the main ways and patterns of the process of improving technical and physical training, a detailed analysis of the dynamics of the specified aspects of sports skills was carried out during long-term observations. The results of measuring the psychophysiological properties of wrestlers of various qualifications are presented in Table 1.

A significant difference in the level of development of psychophysiological properties was noted between wrestlers of high and lower qualification. This indicates that, firstly, psychophysiological properties can determine success in the sports activities of wrestlers and, secondly, that by monitoring the selected properties, it is possible to obtain an idea of the effectiveness of the training process of a specific wrestler or group of wrestlers. The results of the pedagogical experiment in both groups were processed using mathematical statistics methods (Table 2).

A significant difference in both groups was found between the first training session and the training session with competitive bouts. Based on the results in both groups, it can be concluded that the results of the tapping test after training sessions of various focus change very insignificantly. At the same time, the results of tremor changes in both groups have the same tendency - they increase after a training session with competitive practice (control and selection bouts) and are less significant after training sessions on practicing techniques in pairs and general physical training. This indicates the manifestation of mental stress in the conditions of a competitive bout. Such an important indicator for the sports activity of a wrestler as the time of a complex motor reaction also revealed a similar tendency in both training groups. The time of a complex motor reaction decreases after the use of competitive practice, which indicates the effectiveness of preliminary psychological preparation. At the same time, the following identified trends can be considered the most important result of the pedagogical experiment:

• In the experimental group, changes in the time of a complex motor reaction during the special preparatory period are more abrupt, and after the last measurement (the 11th training session), the time of a com-

Table 1. Differences between the psychophysiological properties of wrestlers of different qualifications

Psychophysiological indicator	MS, CMS	II-III category	Student's coefficient	Significance of differences
Simple reaction time s	0,146±1,95	0,174±1,91	4,65	<0,01
Complex reaction time, s	0,239±3,17	0,253±3,30	3,34	<0,01
Tapping test	57±1,85	45±1,86	3,77	<0,01
Tremor	39,6+3,09	56,7±3,10	2,07	<0,05

Table 2. Differences in the results of the study of the level of psychophysiological properties during the special preparatory stage in the control and experimental groups

Group	Psycho-physiological indicator	Average value after the 1st training	Lowest average value after training for the special preparatory stage	Significance of differences	Value at the end of the special preparatory stage	Significance of differences
Control	Complex reaction time	241,23±3,25	246,22±3,56	<0,01	243,07±3,21	<0,05
	Tapping test	58,00±1,90	55,75±1,80	<0,05	57,00±2,11	<0,05
	Tremor	39,13±3,10	45,25±3,10	<0,05	44,62±3,430	<0,05
Experimental	Complex reaction time	237,07±3,80	241,37±3,80	<0,01	236,12±3,88	<0,05
	Tapping test	57,38±1,00	55,63±1,00	--	57,88±0,810	--
	Tremor	38,88±3,30	42,75±3,30	<0,05	40,00±3,80	--

Table 3. Differences in the results of the study of the level of psychophysiological properties during the pedagogical experiment in the control and experimental groups

Group	Psychophysiological indicator	Average value before the experiment	Average value after the experiment	Significance of differences
Control	Complex reaction time	240,38±3,20	240,63±3,20	--
	Tapping test	58,75±1,90	58,88±1,90	--
	Tremor	38,63±3,12	38,38±3,10	--
Experimental	Complex reaction time	236,25±3,77	234,63±3,60	<0,05
	Tapping test	58,13±1,90	59,00±1,95	--
	Tremor	38,13±3,30	36,75±3,28	<0,05

plex motor reaction was less than after the 1st, i.e. the value of this psychophysiological indicator improved during the special preparatory stage. Tremor indicators also changed abruptly, but stabilized during the special preparatory stage.

• In the control group, changes in psychophysiological parameters were smoother, but by the end of the stage, absolute indicators worsened. Thus, the training load in the experimental group, without differing in total volume, ratio of various training tools and intensity, was more contrasting in nature compared to the control group. As a result, despite significant volumes of loads, the psychophysiological indicators of the subjects did not worsen. In the control group, psychophysiological indicators tend to decrease, which can be explained by the monotony of the loads.

At the next stage of the study, a pedagogical experiment was conducted to ensure the optimal level of psychophysiological indicators of qualified wrestlers through the use of ideomotor exercises. For this purpose, an experimental technique was developed, which was used at each training session in the experimental group (duration of the exercises was 7-10 minutes). Psychophysiological indicators were recorded immediately before the competitions at intervals of two months. The results are presented in Table 3.

Monitoring the dynamics of psychophysiological indicators allowed us to identify the features of the influence of the experimental methodology in the preparatory and pre-competition stages on the psychophysiological parameters characterizing the readiness of wrestlers. Improvements during the experiment were noted only in the experimental group.

Conclusions. As a result of using the experimental method: a) the wrestlers in the experimental group showed a significant improvement in two of the three psychophysiological properties studied; b) the study established a connection between psychophysiological properties and the degree of psychological and physical stress during training; c) a method for correcting the psychophysiological properties of athletes was developed.

References

1. Kuvanov V.A., Simakov A.M., Kuvanov Ya.A., Korostelev E.N. Proyavleniye agressivnosti v povedenii bortsov i sposoby yeye regulyatsii. Teoriya i praktika fizicheskoy kultury. 2022. No. 4. pp. 66-68.
2. Kuzmin M.A., Smirnova N.N., Kostromin O.V. Tekhnologiya psikhologicheskoy adaptatsii sportsmenov k usloviyam sorevnovaniy s uchetom ikh lichnostnykh osobennostey. Teoriya i praktika fizicheskoy kultury. 2020. No. 3. pp. 39-41.
3. Rudenko G.V., Dubrovskaya Yu.A., Bobrov I.V. Metodika opredeleniya psikhofizeologicheskogo potentsiala organizma. Teoriya i praktika fizicheskoy kultury. 2018. No. 4. pp. 8-10.
4. Rudenko G.V., Tkachuk M.G., Dorofeyev V.A. Morfologicheskiye pokazateli uspeshnosti sorevnovatelnoy deyatelnosti v yedinoborstvakh. Teoriya i praktika fizicheskoy kultury. 2020. No. 4. pp. 92-95.
5. Tkachuk M.G., Panchenko I.A., Kuvanov Ya.A. Vliyaniye somatotipa na svoystva lichnosti bortsov. Teoriya i praktika fizicheskoy kultury. 2021. No. 4. pp. 15-16.

Variations in students' visual perception of gymnastic movements and their ability to quickly grasp the concept

UDC 159.9.072

PhD, Associate Professor **V.P. Umnov**
Petrozavodsk State University, Petrozavodsk

Corresponding author: uvpp@mail.ru

Received by the editorial office on 19.11.2024

Abstract

Objective of the study was to analysis of the variations in how students perceive gymnastic movements visually and the time it takes for them to form an impression of these movements.

Methods and structure of the study. The chosen model was to create a mental image of a relatively simple physical activity. This was achieved by presenting students from the Faculty of Physical Education (n=188, aged 18-23) with a series of images that depicted the different phases of the movement. The subjects were asked to form a holistic mental image of the physical activity. The study was conducted using the tachystoscopic method, which involved two stages. The first stage involved gradually increasing the duration of the display of the object, allowing the subjects to perceive and identify it. The second stage involved repeatedly displaying the object for a fixed duration, which corresponded to the duration of the physical activity.

Results and conclusions. It is evident that the extent to which individuals differ in their ability to quickly create a mental image of a visual stimulus is influenced by both the method of presenting the stimulus and its complexity for comprehension. The identification of variations in students' visual perception of gymnastic movements and their capacity to swiftly grasp the concept of these movements can be viewed as a multifaceted human capacity for rapidly forming a mental representation of a motor action.

Keywords: *physical exercises, training, individual differences, abilities, perception features.*

Introduction. Didactic research in the field of physical education and sports makes real learning processes their object, reveals the essential characteristics of the main elements of this process [6]. In the practice of physical education and sports, the subject of study is motor actions (physical exercises), where the main one at the initial stage of training is the visual method (more precisely, «methods of ensuring visuality»), ensuring visual, auditory and motor perception of the studied and completed educational tasks. As a result, students develop an idea of the learned motor actions, which, according to I.M. Sechenov, is a regulator of human movements. «In order to perform its function, this reflection must be objectively correct» [3, 152 p.].

Consequently, the more accurate the sensory image, the faster and easier (all other things being equal) motor skills and abilities are formed on its basis. Most physical exercises are short-term in nature of execution, which creates difficulty in forming a sensory image: the subject may not have time to perceive the demonstrated motor action in one demonstration. Improving the conditions for perceiving such exercises may be associated with: 1) increasing the time of showing the exercise, 2) multiple showings with the same presentation time. The latter concerns those exercises that cannot be broken down without disrupting the structure of the motor action. Based on a number of works [1, 4, 9], it can be assumed that under these conditions, individual differences in the perception of physical exercises by students play a special role: those who perceive the motor action being studied more quickly and fully, form an idea of it more quickly. Therefore, identifying the factors that determine the

differences in the success of visual perception and the formation of ideas about physical exercises is a pedagogically important problem in the context of individualizing the learning process when using the method of providing clarity.

Objective of the study was to analysis of the variations in how students perceive gymnastic movements visually and the time it takes for them to form an impression of these movements.

Methods and structure of the study. As a model, we chose the formation of an idea of a relatively simple physical exercise by presenting students of the Faculty of Physical Education with successively alternating graphic images (movement phases), upon perception of which the subjects had to form an idea of a complete physical exercise.

The study used the tachistoscopic method. The equipment consisted of a slide projector with a time relay connected to it and a translucent screen. The subject sat at a table at a distance of 70 cm from the screen. Based on the technical design of the relay, the tested test objects were presented at the following exposures: 0,45; 0,91; 1,33; 1,50; 1,69; 2,00; 2,33 and 2,50 s. Before presenting the test objects, the subject was adapted to the experimental conditions: stimulus material not used in the main experiment was used at the shortest exposure – 0,45 s. The study consisted of two series.

The 1st series is generally accepted, associated with an increase in the time of the object, used to determine the time of perception or recognition of the latter. The 1st test object shows a stand on the shoulder blades, arms and head with support by the hands, usually performed in gymnastics classes independently and in various combinations. The 2nd test object shows a forward roll in the form of three static poses. Both test objects were presented with an increase in the exposure time until the subjects had fully formed an image of the exercise being exposed, which we judged by the identity of the presented image with its graphic sketch by the subject. This option imitates the demonstration of the physical exercises being studied, which can be «expanded» in the time of their execution in order to facilitate their perception by the students.

The 2nd series is associated with repeated presentations of the object on a constant exposition, which corresponds to multiple demonstrations of physical exercises, the demonstration of which is characterized by short duration and cannot be extended in time, and, therefore, creates a time limit for their perception. The 3rd test object depicts a half-squat, a squat, and a kneeling position; the 4th test object – individual phases of a forward somersault (different from the 2nd test object). The number of presentations of the stimulus material required for the subject to form an image of the exposed object was recorded. The duration of the experiment did not exceed 20 minutes. The subject was given the following instructions: «Look carefully at the screen, where an image will be presented for a very short time: various gymnastic poses. After each presentation of the image, graphically sketch what you saw. The image will be presented until it is completely graphically reproduced». The study involved 95 young men and 93 young women from the Faculty of Physical Education, aged 18-23 years.

Results of the study and discussion. Hypothetically, the 1st and 3rd test objects are simpler for visual perception than the 2nd and 4th, since the first are represented by gymnastic poses, homogeneously located in space (all poses are in a vertical position) and have less pronounced angular dimensions than the second. The results obtained confirmed the correctness of the assumption (Table 1).

It was necessary to clarify the issue of the identity of the manifestation of the ability to perceive physical exercise regardless of the time mode of presentation of the test object: an increase in the exposure time and the standard exposure time (0,45 s). Spearman's rank correlation was used: the results of the subjects in the 1st series were ranked by the time of formation of the visual image, and in the 2nd series – by the number of repetitions with standard exposure. The high statistical significance of all correlation indicators allows us

Table 1. Average group indicators of speed of formation of a visual image

Gender	Test objects presented					
	1 series (s)			2 series (number of repetitions)		
	1	2	p	3	4	p
Boys	1,25±0,03	1,41±0,04	0,01	3,1±0,14	4,2±0,14	0,001
Girls	1,35±0,04	1,50±0,03	0,01	3,2±0,13	4,4±0,20	0,001

Table 2. Rank correlation coefficients

Gender	Correlation options					
	1	2	3	4	5	6
Boys	0,66**	0,62**	0,35*	0,53**	0,46**	0,50**
Girls	0,66**	0,52**	0,43**	0,51**	0,68**	0,51**

* - $p<0,05$; ** - $p<0,01$.

Table 3. Variability (in %) of individual data in visual perception indicators

Gender	Speed of formation of a visual image			
	1 series		2 series	
	1 test object	2 test object	3 test object	4 test object
Boys	12	16	24	28
Girls	19	14	24	26

to think that, regardless of the time mode of presentation of test objects and their complexity, the same ability to perceive the tested material is studied (Table 2).

The analysis of individual results demonstrated by students during the study of the speed of formation of a visual image of the exposed material revealed the presence of individual differences. Thus, the time required by the subjects to form a visual image in the 1st series was in the range of 0,45-2,00 s for boys for the 1st test object, 0,91-2,33 s for the 2nd test object; for girls, respectively, 0,91-2,33 s and 0,91-2,50 s. The number of repeated presentations on the standard exposure (0,45 s) in the 2nd series was in the range of 1-5 times for boys in the 3rd test object, 2-7 times in the 4th test object; for girls, respectively, 2-5 and 2-10 times. In mathematical statistics, the standard deviation serves as the main measure of the variability of features. Based on the fact that in our study the features are expressed in different units (seconds and number of repetitions), we calculated the coefficient of variation for each test object, which is a relative number expressing the variability of features in percent [5]. It was found that the degree of manifestation of individual differences in the speed of formation of a visual image depends both on the method of presentation of the stimulus material and its complexity for perception (Table 3).

Thus, the values of the variation coefficients (individual differences) for repeated presentations of test objects at a constant exposure of 0,45 s (series 2) were higher than for repeated presentations with an increase in exposure time (series 1). Based on the fact that the experimental conditions imitate the methods of demonstrating motor actions in real educational conditions, their demonstration should be associated with taking into account the individual characteristics of students' visual perception in the first case more than in the second, i.e. when it cannot be expanded («stretched») in time. When comparing the absolute values of the variation coefficients by the complexity factor of the tested material (the 1st and 3rd test objects are simpler than the 2nd and 4th), it was found that for the 2nd and 4th test objects these coefficients are higher than for the 1st and 3rd (except for the 2nd test object for girls). This means that the more difficult the exhibited material is for visual perception, the greater the individual differences in its perception. Consequently, when demonstrating motor actions that are difficult to perceive, it is necessary to take into account the individual characteristics of visual perception and the speed of creating an idea of the students. This is especially true for physical exercises of a dynamic nature (2 and 4 test objects). The manifestation of individual differences in the speed of image formation in all test objects are not errors in perception, as Fechner once believed, but reflect «systematic tendencies that appear in the perception and evaluation of different groups of individuals with different personality structures» [2, 84 p.]. In accordance with the point of view of B.M. Teplov [10], E.P. Ilyin [4], they are interpreted by us as abilities that are not limited to knowledge, skills and abilities [7, 9]. Consequently, differences in these abilities should be identified and taken into account in the process of teaching students physical exercises. Failure to comply with this provision will negatively affect the quality of their learning:

the time and number of demonstrations of the exercise being learned may not be optimal for them.

Conclusions. Individual differences in students' visual perception of gymnastic exercises and the speed of forming an idea about them were revealed, which can be interpreted as a complex human ability to quickly form an image of a motor action.

References

1. Belyaev R.V., Kolesov V.V., Menshikova G.Ya. et al. Issledovaniye individualnykh osobennostey vospriyatiya izobrazheniya pri pomoshchi fraktalnogo analiza trayektoriy dvizheniya glaza. V International Conference on Cognitive Science. Kaliningrad: Kaliningradskiy gosudarstvennyy universitet, 2012. pp. 242-243.
2. Bruner Dzh. Psikhologiya poznaniya. Moscow: Progress publ., 1977. 412 p.
3. Zaporozhets A.V. Vospriyatiye, dvizheniye, deystviye. Psikhicheskoye razvitiye rebenka. Moscow: Pedagogika, 1986. Vol. 1. pp. 119-153.
4. Ilyin E.P. Psikhologiya individualnykh razlichiy. St. Petersburg: Piter publ., 2010. 704 p.
5. Lakin G.F. Biometriya. Moscow: Vysshaya shkola publ., 1990. 350 p.
6. Nikolaev I.V., Solomatin S.V. Funktsii i kategorii didaktiki v sfere fizicheskoy kultury i sporta. Sbornik nauchno-metodicheskikh rabot «Teoriya i metodika fizicheskoy kultury, sporta i turizma». St. Petersburg: SPPU Petra Velikogo publ., 2021. pp. 60-63.
7. Rubinshteyn S.L. Osnovy obshchey psikhologii. St. Petersburg: Piter publ., 2002. 720 p.
8. Salnikov V.A., Revenko E.M. Individualnyye osobennosti vozrastnogo razvitiya dvigatelnykh i intellektualnykh sposobnostey. Psikhologiya cheloveka v obrazovanii. 2019. Vol. 1. No. 4. pp. 341-350.
9. Samoylenko E.S., Basyul I.A. Individualnyye razlichiya v vospriyatii skhodstva izobrazheniy lits i kharakteristiki okulomotornoy aktivnosti. Eksperimentalnaya psikhologiya. 2019. Vol. 12. No. 3. pp. 73-91.
10. Teplov B.M. Trudy po psikhofiziologii individualnykh razlichiy. Moscow: Nauka publ., 2004. 440 p.

Characteristics of work-related movements and essential physical attributes of a specialist in adaptive physical education

UDC 796

PhD, Associate Professor **L.M. Kielevyaynen**
V.A. Babaytseva
Petrozavodsk State University, Petrozavodsk

Corresponding author: kielev@mail.ru

Received by the editorial office on 25.11.2024

Abstract

Objective of the study was to characteristics of labor activities and the physical attributes that are essential for a specialist in adaptive physical education.

Methods and structure of the study. The research was conducted at Petrozavodsk State University for a period of three years. The sample consisted of 40 fourth-year students aged 20 to 22, pursuing a degree in 49.03.02 «Physical Education for People with Disabilities». All participants completed a practical, professionally-oriented internship, which lasted three months, at residential schools and the rehabilitation center of the Children's City Hospital.

Results and conclusions. The unique characteristics of the work and the essential physical attributes of an APC professional are explored. The authors suggest that the practical exercises in the course «Physical Culture and Sport (Elective)» for students of the course «Physical Culture for People with Disabilities» should include activities that involve measuring distances, distinguishing between muscle efforts, altering the pace and direction of movement, and enhancing speed.

Keywords: *professional and applied physical training, physical qualities, adaptive physical education, job description, specialist, professional competence.*

Introduction. The work of physical culture specialists is associated with constant physical interaction with people with various health problems and disabilities [3]. They have to help their charges perform physical exercises, provide insurance, carry and move sports equipment, which requires significant physical effort [6, 7]. Effective performance of various work functions is impossible without a sufficient level of physical fitness of the specialist himself. An important component of the professional training of physical culture specialists is the development of a job description. According to M.V. Shcherbakova [8], a job description is a model of the activity and personality of a specialist, reflecting his main functions, range of theoretical knowledge, list of pedagogical skills and abilities, integrative professional and personal qualities. Consequently, the job description models the result that should be achieved in the process of training and education at a university, as well as in the process of independent pedagogical activity. Another integral part of the professional training of specialists in adaptive physical education, based on the requirements of the job description, is professional-applied physical training (hereinafter referred to as PAPT). V.I. Ilyinich and S.A. Polievskiy [2] define professional-applied physical training as a specialized type of physical education aimed at the formation and improvement of the properties and qualities of the individual that are essential for specific professional activities.

As L.I. Lubysheva notes, the professional and applied focus of physical education classes is manifested in the fact that priority is given to methods of teaching professionally significant and applied skills, the formation of psychological stability, motivation and psychophysical readiness to perform future work functions [5]. At the same time, the means of PAPT

are selected taking into account the characteristics of the profession, work and rest regime, dominant motor actions, characteristic work postures, and the load on individual functional systems. Thus, the problem of professional and applied physical training of specialists in APC, the development of scientifically based job descriptions and PAPT programs in this area seems to be very relevant.

Objective of the study was to characteristics of labor activities and the physical attributes that are essential for a specialist in adaptive physical education.

Methods and structure of the study. The research was conducted at Petrozavodsk State University over a period of three years. The group of respondents consisted of 40 fourth-year students aged 20-22 studying in the direction 49.03.02 "Physical Education for Individuals with Health Disabilities". All respondents completed industrial professionally-profile practice for a total duration of 3 months in correctional boarding schools and the rehabilitation center of the Children's City Hospital. Of the total number of students who took part in the survey, 35% work in their free time in the direction of adaptive physical education.

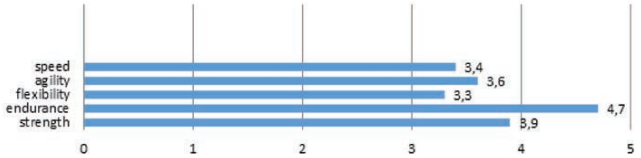
The survey conducted during the study was aimed at identifying the characteristics of work actions and professionally significant physical qualities necessary for the implementation of specialist functions, taking into account the specifics of professional activity. During the survey, respondents had to characterize the distribution of the load and the working posture of a specialist in physical fitness, assess the degree of visual strain, and note the most significant physical qualities in the profession. The degree of significance of a physical quality in the profession of a specialist in physical fitness was determined on a five-point scale, where 1 is a low degree of significance, 5 is a high degree of significance.

Results of the study and discussion. The analysis of the survey results showed that the majority of students believe that their profession is characterized by a free working posture (87,5%), rather than a fixed one. Professional activity is associated with movement (80%), the working area of movement is average (67,5%).

Respondents note that the work of a specialist in APC requires a lot of visual strain (i.e. the organ of vision is involved by more than 50 percent of the total work volume), 82,5% answered that visual strain is within 80-100%, 17,5% of respondents answered that visual strain is within 40-70%.

Fatigue is a symptom complex characterized by a feeling of weakness, lethargy, impotence, a feeling of physical and mental discomfort [4]. According to respondents, the load is distributed to a greater extent on the muscles of the legs (85%), back (75%), arms (65%) and neck (62,5%). Based on the analysis of the survey results, it was possible to identify the characteristics of the work activities of an APC specialist (Table 1).

When ranking professionally significant physical qualities, respondents noted that general endurance is more necessary (on a five-point scale – 4,7 points). Further, physical qualities are distributed by respondents in the following order: strength – 3,9 points, agility – 3,6 points, speed – 3,4 points, flexibility – 3,3 points (Figure 1).



Results of ranking professionally significant physical qualities of a specialist in APC

A.E. Burov and O.A. Erokhina, from the point of view of professional activity, suggest assessing the quality of «dexterity» using such criteria as: speed of reaction to the actions of a partner or a changing work (production) situation (speed of action), the correctness of the sensation of the position of the body or its individual links in space while maintaining a certain posture (vestibular stability) and the accuracy of assessing the distance, distribution of efforts, speed or direction of movement of work actions and operations, and the quality of «speed» as the speed of a single movement, speed of response and frequency of movements [1].

Table 1. Indicators of load distribution and working posture of an APC specialist

Working posture	Movement mode	Working zone of movement	Visual strain	Preferential load on muscles
Free 87,5%	Mobile 80%	Average 67,5%	80-100%	Legs 85%, back 75%, arms 65%

Table 2 Distribution indicators of agility and speed criteria

Criterion	Average score
Dexterity	
Accuracy of estimating the distance, distribution of efforts, speed or direction of movement of work actions and operations	4,5
Speed of response to the actions of a partner or a changing work (production) situation (speed of response)	4,1
Correctness of the sensation of the position of the body or its individual parts in space while maintaining a certain posture (vestibular stability)	3,2
Rapidity	
Reaction speed	4,1
Single movement speed	3,1
Movement frequency	3,0

Thus, with a more detailed analysis of professionally significant qualities, respondents first of all note the criterion of «accuracy of assessing the distance, distribution of efforts, speed or direction of movement of work actions and operations» - 4,5 points and «speed of response» - 4,1 points (Table 2).

C**onclusions.** The study revealed the features of work activities and professionally significant physical qualities of a specialist in physical culture and education. The survey results suggest that it is advisable to include exercises aimed at determining distance, differentiating muscle efforts, changing the speed and direction of movements, and developing speed in the content of the practical part of the work program of the discipline «Physical Education and Sports (elective discipline)» for students majoring in «Physical Education for People with Disabilities».

References

1. Burov A.E., Erokhina O.A. Diagnostika i otsenka professionalno vazhnykh kachestv v praktike professionalno-prikladnoy fizicheskoy kultury. Scientific-practical guide. Cheboksary: ID «Sreda» publ., 2020. 192 p.
2. Ilyinich V.I., Polievskiy S.A. Professionalno-prikladnaya fizicheskaya podgotovka studentov. Study guide. Moscow: MPGU publ., 2018. 120 p.
3. Konovalova N.G., Kovtun O.A. Podgotovka spetsialistov po fizicheskoy kulture dlya raboty s litsami s ogranichennymi vozmozhnostyami zdorovya. Problemy sovremennogo pedagogicheskogo obrazovaniya. 2015. No. 47-2. pp. 123-128.
4. Lebedev M.A., Palatov S.Yu., Kovrov G.V. Ustalost i yeye pro-yavleniya. Rossiyskiy meditsinskiy zhurnal. 2014. No. 4. pp. 282-287.
5. Lubysheva L.I. Otsenka sformirovannosti professionalno-prikladnoy sportivnoy kultury lichnosti v protsesse sportizirovannogo fizicheskogo vospitaniya v vuze. Fizicheskaya kultura i sport v siste-me obrazovaniya: innovatsii i perspektivy razvitiya. Proceedings of the All-Russian scientific-practical conference, St. Petersburg, November 23-24, 2023. St. Petersburg: OOO «Mediapapir» publ., 2023. pp. 7-14. – EDN SKBLDA.
6. Shapkova L.V. Chastnyye metodiki adaptivnoy fizicheskoy kultury. Study guide. Moscow: Sovetskiy sport publ., 2009. 608 p.
7. Shchenkova I.P. Soderzhaniye adaptivnoy fizicheskoy kultury v Rossii. International Journal of Humanities and Natural Sciences. 2020. No. 42. pp. 164-167.
8. Shcherbakova M.V., Kovalev V.V. Professiogramma kak sredstvo professionalnogo samovospitaniya budushchego pedagoga. Izvestiya Volgogradskogo gosudarstvennogo pedagogicheskogo universiteta. 2011. No. 1. pp. 17-21.

Preparation of a china high school teacher in physical education in a network learning format

UDC378.147

Postgraduate student **E. Wang**[1]
Dr. Hab., Associate Professor **G.A. Yamaletdinova**[1, 2]
PhD, Associate Professor **L.N. Rogaleva**[1]
Assistant **I. Yuy**[1]
[1]Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg
[2]Humanities University, Yekaterinburg

Corresponding author: yelong984@gmail.com

Received by the editorial office on 28.01.2025

Abstract

Objective of the study was to pinpoint the elements of physical education teacher education in Chinese universities in the context of online learning.

Methods and structure of the study. The examination of official documents related to online learning, as well as the review of scholarly works on the topic of developing and implementing collaborative Russian-Chinese online educational initiatives, is being conducted.

Results and conclusions. The authors reviewed the prospects for the development of Russian-Chinese cooperation in the field of higher education within the framework of the SCO and BRICS Network Universities, clarified the basic concepts of the study, and justified the need to take into account a number of conditions for the creation and effective implementation of a physical education teacher training program for Chinese universities. The authors noted that when developing online educational programs, firstly, it is necessary to conduct a comparative analysis of the quality requirements for teacher training in Russia and China, secondly, it is important to choose key methodological approaches to designing an educational program for the training of physical education teachers, and thirdly, it will require justification and model development. Fourth, the training of physical education teachers in the format of online learning, It is important to pay special attention to the development of organizational and pedagogical conditions for the implementation of the program, within which it is necessary to provide for the development of recommendations for teachers and students.

Keywords: *training of physical education teachers, professional education, online learning, online educational program, Russian-Chinese cooperation in the field of education.*

Introduction. The partnership between Russian and Chinese universities in the field of professional education has increased significantly over the past decade. This is facilitated by such international organizations as the Educational Foundation of the Asia-Pacific Economic Cooperation (APEC) Forum, the Shanghai Cooperation Organization (SCO), the BRICS University League and the BRICS Network University, created by a group of countries (Brazil, the Russian Federation, India, China).

Along with high-tech specialties such as IT technologies, nanotechnology, computer science and others, pedagogy is also among the priority areas of Russian-Chinese cooperation in the field of education [4]. This is due to the fact that the training of teachers in China is considered a guarantee of building a high-quality education system as a whole [3].

At the same time, it should be noted that the development and implementation of Russian-Chinese programs for the training of physical education teachers in the format of network training is currently at the testing stage. Despite this fact, Lubysheva L.I. and Rosenko S.I. note that the role of physical education universities in the development of the export potential of the Russian education system will increase due to the high international, educational, scientific and humanitarian potential of sports [8].

China's need to improve the quality of training of physical education teachers is primarily associated with ambitious national strategic projects

such as «fitness for all» and «a powerful sports nation» [11].

Ural Federal University (URFU) is one of the network universities of the SCO and BRICS, therefore it actively promotes Russian-Chinese educational programs [1, 2]. Currently, UrFU has signed agreements on the creation of network educational programs of two levels: bachelor's and master's degrees in the areas of 49.03.01 - Physical Education and 49.04.03 – Sports with Dalian University, Liaoning Province, China.

The development of network educational programs with a Chinese university is an innovative project for the Institute of Physical Culture and International Relations (UrFU).

Objective of the study was to pinpoint the elements of physical education teacher education in Chinese universities in the context of online learning.

Methods and structure of the study. Regulatory documents on online learning have been studied, scientific literature on the creation and development of joint Russian-Chinese educational programs has been analyzed, and the necessary conditions for the design and successful implementation of a physical education teacher training program for Chinese universities in the network learning format have been revealed.

Results of the study and discussion. We define the training of physical education teachers for Chinese universities as a system of organizational and pedagogical measures that ensure the formation of students' readiness for professional activity. The concept of "network learning" has various meanings [11], therefore, within the framework of this study, under network learning we consider one of the forms of implementing educational programs, in which students use the resources of several organizations[1]. In this case, an educational program using network learning is considered a network educational program [2].

An analysis of the literature allows us to highlight several key points that need to be taken into account when developing a joint Russian-Chinese educational program in the format of network learning.

Firstly, since the training of specialists for Chinese universities is carried out according to Russian educational standards of the Federal State Educational Standard, the criteria for the quality of training specialists must meet Russian requirements, but at the same time it is necessary to know and take into account the national standards of the foreign university. When conducting a comparative analysis of the quality of training specialists in Russia and China, it is necessary to consider the general trends in the development of higher education, and not compare absolute values due to the significant superiority of the population of China. It is also important to take into account that the priority goal of modern education in China is its focus on improving quality, there are significant differences in the accreditation system of universities in Russia and China, and monitoring is a key component of the Chinese model of quality of personnel training [10]. Secondly, to develop a network educational program, it is necessary to select methodological approaches, where the leading place is occupied by a systemic approach, which allows us to consider the process of training teachers as an integral system, a competence-based approach, which focuses on the formation of professional competencies, a personality-oriented approach within which it is possible to implement an individual approach to training, as well as an integrative approach that allows combining various aspects of professional training [5].

Thirdly, pedagogical modeling should be used to design the educational program, which acts as a tool (mechanism) for constructing and operating the educational and cognitive activity of students in such a way that significant professional and personal competencies are formed during it [5]. The model should include four interrelated components: target, methodological, content and assessment-resultative, each of which plays a key role in ensuring the effectiveness of professional training of physical education teachers.

Fourthly, one of the conditions for the effective implementation of the joint Russian-Chinese network educational program is the formation and consideration of the motives of all participants involved in network training [9], which requires the development of organizational and pedagogical conditions [7].

The organizational and pedagogical conditions should include such aspects as synchronization of university curricula, active use of information and communication technologies, integration of educational programs and the creation of a single educational community. According to E. Knyazev and N. Drantusova, special attention should be paid to such issues as developing the readiness of all teachers to

[1] Federalnyy zakon ot 29.12.2012 № 273-FZ «Ob obrazovanii v Rossiyskoy Federatsii» (red. Ot 19.12.2023). SZ RF. 2012. № 53 (ch. 1).

[2] Prilozheniye N 1. Poryadok organizatsii i osushchestvleniya obrazovatelnoy deyatelnosti pri setevoy forme realizatsii obrazovatelnykh programm. Available at: https://base.garant.ru/74626602/53f89421bbdaf741eb2d1ecc4ddb4c33/ (date of access: 11.11.24).

interact with strategic partners, improving the culture of communications and cooperation of employees [6]. In view of this, the development of recommendations not only for students, but also for teachers of network universities is of particular importance.

C**onclusions.** During the literature analysis, the prospects for the development of Russian-Chinese cooperation in the field of education were considered, key aspects important for the creation and successful implementation of network educational programs were identified. Further research will be aimed at designing a model for training physical education teachers for universities in China in the format of network training.

References

1. Belyaeva E.A., Valeeva M.V. Aktualnaya situatsiya i perspektivy vzaimodeystviya vuzov g. Yekaterinburga i stran SHOS (Na primere KNR). Sotsialno-gumanitarnyye znaniya. 2022. No. 6. pp. 188-191.
2. Borisenkov V.P., Toreeva T.A., Lin U. Razvitiye sistemy podgotovki pedagogicheskikh kadrov v Kitaye v epokhu tsifrovoy transformatsii obrazovaniya. Vyssheye obrazovaniye segodnya. 2023. No. 6. pp. 30-36.
3. Guruleva T.L., Bedareva N.I. Sotrudnichestvo Rossii i Kitaya v oblasti sozdaniya setevykh universitetov i sovmestnykh obrazovatelnykh uchrezhdeniy. Vyssheye obrazovaniye v Rossii. 2019. Vol. 28. No. 4. pp. 108-123. DOI: 10.31992/0869-3617-2019-28-4-108-123
4. Davydova Yu.Yu., Zaytseva O.A., Matyukhin A.V. Organizatsionnaya model mnogourovnevoy obrazovatelnoy sistemy podgotovki pedagoga-issledovatelya na osnove setevoy integratsii. Sovremennyye problemy nauki i obrazovaniya. 2020. No. 5. Available at: https://science-education.ru/ru/article/view?id=30096 (date of access: 18.12.2024).
5. Knyazev E., Drantusova N. Seti v professionalnom obrazovanii. Universitetskoye upravleniye: praktika i analiz. 2010. Vol. 5. No. 69. pp. 24-31.
6. Lo Wanqi. Organizatsionno-pedagogicheskiye usloviya realizatsii rossiysko-kitayskikh obrazovatelnykh programm podgotovki pedagogov. PhD diss. abstract. 2023. 22 p.
7. Lubysheva L.I., Rosenko S.I. Mezhdunarodnaya deyatelnost sportivnykh vuzov: sostoyaniye i tendentsii razvitiya. Teoriya i praktika fizicheskoy kultury. 2023. No. 4. pp. 3-5.
8. Shestak V.P., Vesna E.B., Platonov V.N. Setevoye obrazovaniye: luchshiye i otechestvennyye i zarubezhnyye praktiki. Sovremennyye problemy nauki i obrazovaniya. 2013. No. 6. Available at: https://science-education.ru/ru/article/view?id=10981 (date of access: 05.01.2025).
9. Yu Xie, Yu Song. Postroyeniye sistemy pokazateley otsenki kachestva podgotovki sportivnykh spetsialistov v obshcheobrazovatelnykh kolledzhakh i universitetakh. Zhurnal Khuaybeyskogo normalnogo universiteta. 2021. Vol. 42. No. 1. pp. 88-98.
10. Yakovleva N.A. Setevoye obucheniye v sovremennoy pedagogike. Sovremennaya pedagogika. 2016. No. 12. Available at: https://pedagogika.snauka.ru/ 2016/12/6544 (date of access: 10.09.2024).
11. Song B. et al. Integration and learning: a case study of the international higher physical education talent cultivation model. Frontiers in Education. 2024. 8:1291586.

Analysis of the negative dynamics in the level of physical training of medical university students in the first four years of study

UDC 796

R.V. Safronov
E.S. Vanina
S.V. Pershikov
I.A. Nemchenko
I.M. Sechenov First Moscow State Medical University, Moscow

Corresponding author: rhd8a44@gmail.com

Received by the editorial office on 26.12.2024

Abstract

Objective of the study was to theoretical and practical evidence for alterations in the physical fitness of students throughout their time at a medical university.

Methods and structure of the study. A series of tests was administered to evaluate the evolution of students' physical condition over the course of their university studies.

Results and conclusions. It was discovered that the physical fitness of students in their first and second years of university is average, but it reaches its peak in the second year. After that, in the third and fourth years, there is a sharp decline in physical fitness. Therefore, the authors concluded that after two years of study, students experience a significant decrease in their physical fitness, indicating that the third and fourth years of study are a crucial time for students' health.

Keywords: *level of physical fitness, physical health, physical activity, students, physical qualities, motivation.*

Introduction. The work of students requires the exertion of all mental functions, and is often associated with stressful situations [1]. Research shows that regular optimal physical activity helps improve memory, attention, speed of thought processes and creativity [2, 3]. An effective combination of intellectual and physical activity is the key to successful study at a university and achieving high results in future professional activities [4]. In this regard, the role of physical education in a university is of critical importance. Innovative approaches to the organization of physical education are actively introduced in modern universities [5]. Various types of physical activity are used, including fitness, yoga, swimming, team sports. Sports sections are organized, sports events and competitions are held.

Objective of the study was to theoretical and practical evidence for alterations in the physical fitness of students throughout their time at a medical university.

Methods and structure of the study. The analysis and generalization of scientific and methodological literature, development of a methodology for determining significant indicators of the Level of Physical Fitness of students for the translation of the obtained results into a point system, a pedagogical experiment, and mathematical analysis of the study were carried out.

The program for studying the level of physical fitness was tested among students in the following specialties: pediatrics, dentistry, medical and preventive care, clinical psychology. Students of the 1st to 4th years of study with the medical groups «Basic» and «Preparatory» were involved in the study by random sampling, their ages ranged from 18 to 22 years. A total of 360 students (180 women and 180 men) were involved in this study. The study also took into account the distribution of participants by year of study. As a result, there were 90 students (45 women and 45 men) for each year of study. Data processing was performed using Excel-97, Google Forms. Study procedure: After a warm-up corresponding to the nature of the upcoming physical activity, students underwent an assessment of their physical qualities using six proposed tests.

Table 1. The procedure for calculating points based on testing results

Test number	Unit of measurement	Points									
		1 point		2 points		3 points		4 points		5 points	
		Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
1	%	>76	>76	66-75	66-75	41-65	41-65	21-40	21-40	<20	<20
2	sec	>9,3	>8,3	9,1-9,2	8,1-8,2	8,9-9,0	7,8-8,0	8,3-8,8	7,2-7,7	<8,2	<7,1
3	cm	<164	<208	165-169	205-209	170-179	210-224	180-194	225-239	>195	>240
4	number of times	<7	<23	8-9	24-27	10-11	28-31	12-16	32-43	>17	>44
5	number of times	<28	<31	29 - 33	30 - 32	32 - 34	33 - 36	35 - 42	37-47	>43	>48
6	cm	<6	<4	7	5	8 - 10	6 - 7	11-15	8-12	>16	>13

Test № 1. 20 squats in 30 seconds. The increase in heart rate after squats was recorded in relation to the heart rate at rest as a percentage.

Test № 2. Shuttle run 3 segments of 10 meters. The time to cover the distance was measured in seconds.

Test № 3. Long jump from a place. The length of the jump was measured in centimeters.

Test № 4. Push-ups from the floor. The maximum number of push-ups that the subject could perform was counted.

Test № 5. Raising and lowering the torso from a supine position. The number of repetitions of cycles of raising and lowering the torso in 1 minute was counted.

Test № 6. Forward bend from a standing position with straight legs. The distance in centimeters was measured to which the subject could lower his fingers below the level of the platform on which he stood (Table 1).

After calculating the total score, the physical fitness level of each subject was assessed according to Table 2.

Table 2. Physical fitness level

Total points scored	Physical fitness level
27-30	excellent
21-26	good
15-20	average
9-14	low
8 and less	very low

The results in points were systematized by groups, taking into account the year of study and gender. This allowed us to determine the average values of the physical fitness level and its dynamics compared to the initial level (1 year of study), expressed as a percentage. These results are presented in Table 3: for women, for men, and also the combined results.

Results of the study and discussion. Regardless of gender, there is an increase in the physical fitness level in the second year of study (Table 3). When sports events are held by the sports center (physical education department), most of the participants are first- and second-year students, which confirms the good motivation for physical education and sports of junior students. The academic discipline «Physical Education and Sports» taught to students during the first year of study can also help maintain motivation for such activities. According to statistics from the student sports club, the majority of those involved in sports in the club are first- and second-year students (164 people in the first year, 173 in the second year, 122 in the third year, 112 in the fourth year). Regardless of gender, there is a fairly sharp decrease in the physical fitness level in the third year of study, which stabilizes at a low level in the fourth year of study (Table No. 3). Since the curriculum continues to include classes in the discipline «Applied Physical Education and Sports», such a decrease in the physical fitness level may indicate a decrease in the number or com-

Table 3. Results of the level of physical fitness of students by courses

Year of study (course)	Average Female Score (Change, %)	Male Average Score (Change, %)	Average score without gender (Change, %)
1	17,29	19,81	18,55
2	18,57 (+7,4)	20,67 (+4,34)	19,62 (+5,77)
3	16 (-7,4)	17,53 (-11,51)	16,77 (-9,6)
4	15,45 (-10,64)	18,23 (-7,98)	16,84 (+9,22)

plete absence of independent physical education and sports classes in students' free time in the third and fourth years of study. A decrease in students' motivation for such classes may occur due to a high academic workload and combining study with work, which can negatively affect physical activity. Thus, the third and fourth years of study are a critical point for students' physical health due to a sharp decrease in the physical fitness level, which can lead to a decrease in the overall health of student youth [6]. In this regard, it is necessary to introduce innovative approaches to teaching physical education, increase students' knowledge of their bodies, a healthy lifestyle, and conduct educational work to justify the importance of sports [7]. Individually determine the body's capabilities, form groups of students with the same level of physical fitness.

Conclusions. The results of the research work showed a significant decrease in the physical fitness of university students after two years of study, due to a high academic load and loss of motivation for independent sports activities, which can lead to a decrease in health and negatively affect the process and results of education. In this situation, third- and fourth-year students are recommended, in addition to attending mandatory physical education classes, which are included in the university curriculum, to improve and maintain their level of physical fitness through independent and organized physical education and sports classes outside of school hours with the support of the structure available at the university (student sports club). It is also necessary to individualize the educational process, introduce a differentiated approach to each student. Individually determine the capabilities of the body and form groups of students with an equivalent level of physical fitness for the corresponding physical load in physical education classes.

References

1. Bobrishcheva-Pushkina N.D., Kuznetsova L.Yu., Popova O.L. Ekzamenatsionnyy stress u studentov meditsinskikh vuzov: rasprostranonnost, prichiny i profilaktika. Gigiyena i sanitariya. 2018. No. 5. pp. 457-459.
2. Dayanova M.A., Korobeynikova E.I. Fizicheskoye i umstvennoye vospitaniye cheloveka dlya garmonichnogo razvitiya lichnosti. Nauka-2020, publ. 2019. No. 2 (27). pp. 18-25.
3. Gavrishova E.V., Grachev A.S., Tretyakov A.A. Rol emotsiy v formirovanii u studentov motivatsii k dopolnitelnym fizkulturno-ozdorovitelnym zanyatiyam. Izvestiya TulGU. Fizicheskaya kultura. Sport. 2019. No. 11. pp. 15-20.
4. Safronov R.V., Voronova N.N., Bochkova V.S. et al. Vliyaniye fizicheskoy nagruzki raznoy intensivnosti na umstvennuyu deyatelnost studentov. Teoriya i praktika fizicheskoy kultury. 2024. No. 2. pp. 73-75.
5. Naskalov V.M., Zhernakova N.I. Innovatsionnyye tekhnologii v fizicheskom vospitanii studentov vuzov kak put k zdorovyesberezheniyu. Aktualnyye problemy meditsiny. 2010. No. 22 (93). pp. 1-6.
6. Andryushchenko Yu.V., Tikhaya A.G. Dvigatelnaya aktivnost kak odin iz sposobov sokhraneniya zdorovya studencheskoy molodezhi. Pedagogicheskiye i sotsiologicheskiye aspekty obrazovaniya. Proceedings of the International scientific and practical conference (Cheboksary, April 25, 2018). L.A. Abramova [ed.]. Cheboksary: «Sreda» publ., 2018. pp. 247-249. – ISBN 978-5-6040294-1-1.
7. Grigorovich S.I., Ptushkin A.S. Rekomendatsii po razvitiyu motivatsii k zanyatiyam fizicheskoy kulturoy. MNIZH, publ. 2020. No. 11-3 (101). pp. 113-114.

The educational value of competitive sports in developing students' sense of national pride

UDC 37.013.42+ 796.011.1

Dr. Hab., Associate Professor **A.V. Ponomarev**
O.V. Obukhova
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: kristiobuhova@urfu.ru

Received by the editorial office on 28.01.2025

Abstract

Objective of the study was to explore the possibilities of using sports games to foster a sense of patriotism among university students.

Methods and structure of the study. To assess the development of patriotic sentiments, a survey was conducted among students of Ural Federal University. The survey was administered through a questionnaire, which was completed on the Yandex form and shared via social media platforms. The survey was conducted from September to December 2024. Additionally, a content analysis was performed on the social media pages of the university's gaming sports clubs.

Results and conclusions. The findings of the online student survey indicate that game sports have the potential to foster patriotism, cultivate character traits, promote teamwork, and enhance civic engagement and national pride. The survey also explores the potential for students to engage in game sports as participants or supporters.

Keywords: *patriotic attitudes, game sports, students, potential.*

Introduction. In the modern world, where issues of national identity and patriotism are at the forefront of public debate, the importance of developing patriotic attitudes among young people is beyond doubt. Young people bear a great responsibility for preserving the country's history, its traditions, and culture, which is especially important now in an unstable geopolitical situation. Patriotic education is one of the main tasks of modern society. According to the Decree of the President of the Russian Federation of November 9, 2022 No. 809 «On Approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values», state policy for the preservation and strengthening of traditional values is implemented in the field of education and upbringing, work with youth, culture, science, interethnic and interreligious relations, mass media and mass communications, international cooperation[1].

One of the effective ways to facilitate this process can be game sports, which not only develop physical skills, but also help to form the participants' character, collectivism, civic consciousness and a sense of national pride for the team, region, country. In the system of patriotic education of the youth of Russia, the concept of «10 Facets of Patriotism» has been developed, in which each of the facets reveals patriotism in its own way and uses various tools, for example, the facet of Sports is associated with high-performance sports, when athletes represent their country in the international space, the importance of «developing domestic sports leagues and communities, creating volleyball, football and other sports teams in organizations and enterprises» is also indicated[2].

According to the research of M.N. Aliev, D.Z. Drandarov, «The main goal of physical education is to prepare a comprehensively developed individual, ready for work and defense of the Motherland» [1].

[1] Ukaz Prezidenta Rossiyskoy Federatsii ot 9 noyabrya 2022 goda, N-809 «Ob utverzhdenii Osnov gosudarstvennoy politiki po sokhraneniyu i ukrepleniyu traditsionnykh rossiyskikh dukhovno-nravstvennykh tsennostey» Available at: http://www.kremlin.ru/acts/bank/48502.

[2] Osnovy patrioticheskogo vospitaniya grazhdan Rossiyskoy Federatsii. Metodicheskiye rekomendatsii – FGBU «Rospatriottsentr» 10.10.2022 g.

A.N. Sozonova, S.I. Khromina indicate that «sports and patriotic education is everyday and targeted work with young people to develop perseverance, determination, courage, and discipline» [5]. In this regard, it is especially relevant it becomes possible to consider the issue of the potential of team sports in the formation of patriotic attitudes in students.

The peculiarity of team sports is that the team as a whole wins and loses in them, and not individual athletes. A sports team is the same integral sports unit as an athlete in individual sports. Such specificity of team sports determines a number of requirements for athletes, their views, attitudes, personal qualities, and the nature of their actions in the competition.

Team sports are an effective potential in the formation of patriotic attitudes, naturally, with the appropriate activities of coaches, teachers, specialists and other participants in the training process. It is team sports that contribute to the development of team qualities, team spirit, which can be elements of patriotism. The potential of team sports in patriotic education of students, in our opinion, can be defined as a set of opportunities to use the resources of these sports in the process of educating future specialists, expressed in the formation of a system of values based on the collective nature of the activity using the emotional component of the competitive and training processes, as well as various forms and methods of information and propaganda activities. In his publications, A.N. Samoukin characterizes the potential as a set of resources [4, 7 p.], V.G. Belomestnov defines the potential as a set of opportunities [2, 196 p.], R.A. Belousov considers the potential as certain abilities of an individual [3, 3 p.]. Therefore, the resources and opportunities of team sports, as well as the abilities of each player, can act as an effective potential in the formation of patriotic attitudes.

Objective of the study was to explore the possibilities of using sports games to foster a sense of patriotism among university students.

Methods and structure of the study. In order to determine the level of patriotic attitudes, a survey of students of the Ural Federal University was conducted by distributing a questionnaire completed in the Yandex form via social networks in September-December 2024, as well as a content analysis of the pages of UrFU game sports clubs in social networks.

The survey involved 211 students (49% boys and 51% girls) of the Institute of Physical Culture and Youth Policy, 1-2 years, of which 77 students are studying in the direction of training «Organization of work with youth», 103 – in the direction of training «Physical Education», 32 – in the direction of training «Sports / Sports training in game sports».

As part of the Content Analysis of Social Networks, the pages of seven game sports clubs were analyzed (UrFU volleyball club, women's basketball club «UrFU Sima-Land», men's basketball club «UrFU», handball, rugby, football and mini-football clubs).

Results of the study and discussion. In accordance with the classification of sports by the nature of motor activity in competitions by L.P. Matveev, six sports groups were identified, which we combined into two larger ones: this is the 1st group – sports games, in which team confrontation is definitely within the rules (game sports) and the second group included other sports (martial arts, cyclic, speed-strength, complex coordination sports and all-around).

The first group – 64,2% and the second group – 35,8% of students in the sample. The most common game sports among the respondents of the first group were team sports: volleyball, basketball, football, handball, football, hockey. Of the total number of respondents – 30% believe that they are engaged in sports professionally; 47% - are engaged in sports at an amateur level and 23% are engaged in it to keep fit.

To the question: «What do team sports give you?» – respondents of the first group answered: the ability to work in a team – 96%, learning to make decisions in accordance with given circumstances – 64%, developing communication – 59% and leadership qualities – 42%. Respondents of the second group answered the same question: leadership qualities – 74%, the ability to work in a team – 5%, learning to make decisions in accordance with given circumstances – 21%.

To the next question, «What qualities are most significant in society?» respondents of both groups answered approximately the same: 34% – communication (1st group) and 29% – 2nd group. In the first group, 19% received – team interaction, tolerance and flexibility in interaction with others, in the second group: 19% – tolerance, management qualities and flexibility in interaction with others. In the first group, one of the last places is occupied by management qualities 9%, in the second group 9% – team interaction. Thus, the students of the first group realize that playing sports forms their personal qualities necessary in a social environment when working in a team, and the students of the second group high-

light leadership qualities in one of the first places. The students of the first group highlighted that the training and competitive process fosters a sense of friendship, camaraderie, mutual assistance, responsibility to the team, respect for partners and rivals, subordination of personal interests to team interests regardless of the status of the competition, while the second group notes them only when the competitive process is at the international level.

The next block of questions was related to the awareness of the role of the university, coaches and teammates in the personal development of student-athletes. Among the students of both groups, 88% and 85% understand the contribution of the university to their development, believe that a developed sports infrastructure, personal interest of the coach and support of teammates are important in their sports achievements and only 12% (1st group) and 15% (2nd group) consider sports achievements as personal merit.

The third block of questions concerned the students' ability to give their all for the benefit of their team. Of the respondents involved in team sports, 73% were ready to put the interests of the team above their own; 64% were ready to come to the rescue, support their teammate to the detriment of their personal interests, while students from the second group only at international competitions.

The fourth block of questions most fully reflected the patriotic feelings of students. We asked questions related to the attitude to the sports club, the team, the symbols, traditions and history of the team, to understanding the meaning of the anthem, flag, coat of arms of the country in international competitions. All survey participants from the first group (100%) showed a sense of patriotism, indicated the most significant achievements of their club, team, players. They expressed loyalty to the team, active social life and a desire to continue sports traditions. Students of the 2nd group – 58% are ready to show a sense of patriotism only at international competitions, at regional and municipal competitions only 76% are proud of the achievements of their club or team members. Thus, team sports have great potential for developing patriotism, a sense of duty and loyalty to their native country in students. As mass competitions, they act as a tool for consolidating citizens and a powerful factor in expressing patriotic feelings, not only among players, but also among fans, since the fans perceive the achievements and victories of the players as their own and the victories of the country, which especially unites and unites players and fans at international competitions. Take the victory in 2022 of the UrFU-Sima-Land Women's Basketball Club, when for the first time in its history the team won the championship title of the Belov League within the Student Basketball Association, the players noted after the final game that they won with the help of the «sixth player – the spectator». It is the potential of team sports that can be considered from the point of view of opportunities, a means and a resource in the formation of patriotic attitudes, primarily sports professionalism, the charisma of the players, their dedication to the game, team cohesion, the history of the team, its ability to attract the attention of spectators and fans.

As a resource, we consider the sports infrastructure of the university, which allows for comfortable training and competition processes for players and fans. The sports base of UrFU makes it possible to organize and hold sports events at a high international level, which was demonstrated by the International University Sports Festival 2023.

The university has 24 national teams in various sports, including seven in team sports (basketball, volleyball, handball, rugby, mini-football, football, hockey), many of these teams are participants and winners of regional, regional, All-Russian, International competitions, Spartakiads, Universiades, Championships, Student leagues. Each of the teams has pages on social networks created for players, fans and sports enthusiasts. This allows attracting young people to perceive information about team sports and is a convenient format. The following data was obtained during the content analysis of social networks of team pages: information about games, players, coaches, team events, game schedules, photo and video materials are presented. The maximum number of subscribers on one of the pages reaches 2000 people, the total number of subscribers for all the listed teams is more than 6500.

Conclusions. The authors, based on their research, have shown the high potential of team sports in developing patriotic attitudes, which is obvious, due to the fan base and spectacular nature of the competitive process, and the opportunity for even a non-professional athlete to cultivate personal qualities that characterize patriotism. It is the students who form the university's game teams who can act as indicators of the development of patriotic attitudes.

After all, they come from different cities and sometimes play with a team from their hometown during competitions, but the team spirit and the desire to win as a team win in the internal struggle. Therefore, it is important to support team sports at the university level and create conditions for their development.

References

1. Aliev M.N., Dzhandarov D.Z. Znacheniye fizicheskoy kultury i sporta v patrioticheskom vospitanii uchashcheysya molodezhi. Vestnik SVFU 2009. No. 3. Available at: https://cyberleninka.ru/article/n/znachenie-fizicheskoy-kultury-i-sporta-v-patrioticheskom-vospitanii-uchascheysya-molodezhi (date of access: 20.01.2025).
2. Belomestnov V.G. Problemy upravleniya ekonomicheskim potentsialom sotsialno-ekonomicheskikh sistem. Problems of modern economics. 2005. No. 1, 2 (13/14). pp. 195-201.
3. Belousov R.A. Rost ekonomicheskogo potentsiala. Moscow. Economy, 2001. 261 p.
4. Samoukin A.N. O soderzhanii ponyatiye potentsial obshchestva. Methodology of statistical study of socio-economic potential. Moscow. Economy, 1986. 67 p.
5. Sozonova A.N. Khromina S.I. Izucheniye roli fizicheskoy kultury i sporta v patrioticheskom vospitanii studencheskoy molodezhi. Pedagogical journal. 2023. Vol. 13. No. 4A. pp. 203-209. DOI: 10.34670/AR.2023.69.47.024

Swimming as a Means of Personal Development of Students in the Educational Environment

UDC 797.212

PhD, Associate Professor **S.A. Grigan**[1]
PhD, Associate Professor **G.I. Lyashko**[2]
[1]Russian Academy of National Economy and Public Administration under the President of the Russian Federation, North-West Institute of Management, St. Petersburg
[2]Rostov State University of Transport, Rostov-on-Don

Corresponding author: svetlana-grigan@mail.ru

Received by the editorial office on 27.04.2025

Abstract
The problem of forming individual and collective qualities of students in the process of their education and upbringing occupies a central place in pedagogical and psychological research. Particular attention is paid to physical activity as a tool for harmonious personal development. In this context, swimming is considered an effective means of forming key personal qualities. Physical activity is a powerful factor in the development of personal characteristics such as purposefulness, self-control, and stress resistance. Regular sports activities improve cognitive abilities, develop emotional stability, and contribute to the formation of motivation for self-development. The purpose of the study is to analyze the effectiveness of using swimming as a means of personal development in the educational environment. The study involved 60 students who participated in an experiment for a semester (12 weeks) at Rostov State University of Transport. Humanities majors require the development of students' skills in interpersonal interaction, empathy, and communicative competence. Physical education, integrated into the educational process, stimulates the manifestation of qualities such as responsibility, mutual respect, and collectivism. Swimming stands out among other sports for its versatility. Water-based activities contribute to the development of physical endurance, coordination of movements, and psycho-emotional stability. Water creates unique conditions that reduce tension and increase concentration, which is especially important for students under intellectual loads.

Keywords: *development of collective qualities, swimming, physical activity, self-organization in swimming classes.*

Introduction. The problem of forming individual and collective qualities of students in the process of their education and upbringing occupies a central place in pedagogical and psychological research. Particular attention is paid to physical activity as a tool for harmonious personal development. In this context, swimming is considered an effective means of forming key personal qualities.

According to research, physical activity is a powerful factor in the development of personal characteristics such as purposefulness, self-control, and stress resistance. Smirnov emphasizes that regular sports activities improve cognitive abilities, develop emotional stability, and contribute to the formation of motivation for self-development [4].

Humanities majors require the development of students' skills in interpersonal interaction, empathy, and communicative competence. Physical education, integrated into the educational process, stimulates the manifestation of qualities such as responsibility, mutual respect, and collectivism. Swimming stands out among other sports for its versatility. Water-based activities contribute to the development of physical endurance, coordination of movements, and psycho-emotional stability. Water creates unique conditions that reduce tension and increase concentration, which is especially important for students under intellectual loads [1, 2].

The authors' works emphasize that swimming activities contribute to strengthening interpersonal relationships in the group. During training, students learn to cooperate, support each other, and solve tasks together. This forms the basis for the development of collective qualities such as trust, mutual understanding, and the ability to work in a team.

Swimming is actively used for the prevention of stress and psycho-emotional disorders. Sergeeva notes that regular water training improves overall well-being, increases the level of endorphins, and reduces anxiety. An important aspect is the combination of aerobic exercise with the gentle effect of water, which minimizes the risk of injury and allows people of different levels of physical fitness to swim [3].

The authors draw parallels between swimming and the development of willpower qualities. The ability to overcome physical difficulties in water is directly related to increased self-confidence and the development of independence.

Individual qualities such as self-discipline, perseverance, and responsibility are developed through systematic training. The authors emphasize that students engaged in swimming demonstrate a higher level of concentration, patience, and organization. These skills are reflected in their academic activities, helping them achieve better results.

The collective nature of swimming training contributes to the development of social skills and strengthens team spirit. Interaction in a group during swimming activities allows students to learn to consider the interests of others, distribute roles, and take responsibility for the overall result. The authors' research focuses on the importance of creating a favorable social environment where students feel support and mutual assistance. Such an environment contributes not only to the development of teamwork skills but also to the formation of students' sense of social responsibility.

Foreign authors highlight the special role of swimming in forming stress resistance in young people. Studies have shown that students engaged in swimming demonstrate higher levels of psychological stability and the ability to adapt to changes. Swimming activities also increase life satisfaction and strengthen personal resources [1].

An analysis of the literature shows that swimming has significant potential for the development of individual and collective qualities of students. However, questions remain about adapting swimming training methods for humanities majors and studying the long-term impact of this activity on students' personal development.

The purpose of the study is to examine the impact of swimming on the development of individual and collective qualities of students in the humanities.

Methodology and Organization of the Study. To achieve the set goals, the following methods were used:

1. Theoretical methods: analysis and synthesis of scientific literature to determine key approaches to the formation of personal qualities through physical activity.

2. Empirical methods: surveys conducted before and after the swimming course to assess changes in individual and collective qualities.

3. Data processing methods: quantitative analysis of survey and testing results using statistical analysis software (SPSS) and qualitative analysis of observations and student feedback.

Behavioral changes, such as group interaction, activity, and participation in collective tasks, were recorded during training sessions.

Standardized psychological tests, such as the R. Cattell questionnaire for measuring personality traits, as well as methods for assessing teamwork, were used in the testing.

The study was conducted over one semester (12 weeks) at Don State Technical University. It involved 60 students from the humanities faculty, divided into two groups: the experimental group: 30 students who regularly attended swimming classes. The control group: 30 students who continued to participate in standard physical activity not related to swimming.

Each session lasted 60 minutes and included three stages: 1. Warm-up on land (10 minutes). 2. Main part (40 minutes): performing exercises aimed at developing physical qualities, coordination, and teamwork. 3. Final part (10 minutes): relaxing exercises in the water. The 12-week swimming program for students included both individual and group exercises.

Study participants were informed about the goals, tasks, and methods of the study. All data were collected with confidentiality and used exclusively for scientific purposes. Participation in the study was voluntary.

The main focus was on determining the degree of impact of regular training on qualities such as self-discipline, responsibility, ability to work in a team, and communication skills.

Tasks of the Study:

1. Analyze the initial level of individual and collective qualities of students in the humanities.

2. Develop and implement a swimming program aimed at developing personal qualities.

3. Assess the dynamics of changes after the implementation of the program.

4. Compare the results with the control group that did not participate in the program.

It is assumed that swimming activities, including el-

ements of individual and group training, positively affect the formation of key personal and social qualities in students of the humanities.

Results of the Study. Before the start of the experiment, an analysis of the initial level of individual and collective qualities of students was conducted. The results showed that most participants in both groups had an average level of qualities such as responsibility, self-discipline, and the ability to work in a team. No differences were found between the experimental and control groups before the start of the program ($p > 0.05$) (Table 1).

Changes in Individual Qualities. After 12 weeks of swimming, significant changes were observed in the experimental group:

Self-discipline: Participants in the experimental group showed an increase of 28% ($p < 0.01$), while changes in the control group were minimal (+5%, $p > 0.05$).

Self-confidence: According to test results, this indicator increased by 21% ($p < 0.01$) in the experimental group. Participants noted that regular swimming helped them overcome the fear of water and improve self-esteem.

Changes in Collective Qualities

Swimming also positively affected the collective qualities of students:

1. Teamwork: Indicators increased by 34% in the experimental group ($p < 0.01$), indicating a better ability of participants to interact and coordinate in group tasks.

2. Communication skills: The experimental group showed an increase of 17% ($p < 0.05$). Participants noted that performing joint exercises in the water contributed to improved communication skills.

Comparison of Experimental and Control Groups

The control group, which participated in standard physical activity, did not show significant improvements in key parameters ($p > 0.05$). In contrast, the experimental group demonstrated statistically significant improvements in almost all studied indicators ($p < 0.01$).

Qualitative Analysis of Feedback. After the completion of the program, students in the experimental group provided feedback. They noted that swimming helped not only physically but also psychologically: participants began to understand each other better, showed more initiative, and cooperated more. Most students emphasized that swimming became a way for them to relieve stress and improve their mood.

Conclusions. The results of the study showed a positive impact of swimming on the development of individual and collective qualities of students in the humanities. The development of individual qualities: Regular training stimulated personal growth of participants, increasing their self-discipline and self-confidence. This is consistent with the conclusions of [1], which also noted that swimming contributes to the strengthening of personal qualities.

The development of collective qualities: Group exercises in the pool created conditions for interaction, leading to improved teamwork skills. This result is consistent with the studies of [2], confirming that group activities strengthen a sense of belonging and mutual understanding.

Control group: The absence of significant changes in the control group highlights the uniqueness of swimming as a tool for personal development, surpassing standard forms of physical activity.

From the results of the study, the following conclusions can be drawn:

Table 1. Changes after the Experiment

Group	Before the Experiment			
	Self-discipline	Self-confidence	Teamwork	Communication skills
Experimental	3,5	3,6	3,7	3,4
Control	3,4	3,5	3,6	3,3

Table 2. Changes after the Experiment (continued)

Group	After the Experiment			
	Self-discipline	Self-confidence	Teamwork	Communication skills
Experimental	4,3	4,2	4,7	3,9
Control	3,5	3,6	3,7	3,4

1. Swimming activities contribute to the development of individual qualities such as self-discipline, self-confidence, and stress resistance.

2. Group training stimulates the development of collective qualities, including the ability to work in a team and communication skills.

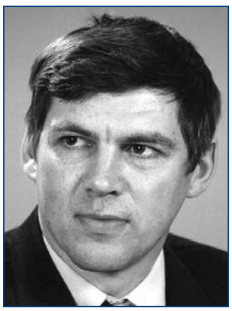
3. The introduction of regular swimming activities into the educational process of humanities majors can become an effective tool for personal and professional growth of students.

References

1. Broun N. Swimming and its impact on psychological resilience // International Journal of Sports Psychology. 2020. Vol. 15. №4 P 345- 360.
2. Grigan S.A. The impact of physical culture and sports on the formation of moral and ethical qualities of students / S.A. Grigan, N.N. Nescheret, A.A. Gvozdkova, O.V. Pleskacheva // Teoriya i praktika fizicheskoy kultury. 2025. № 1. P. 75-77.
3. Ivanova V.A. The impact of physical culture on mental health // Young Scientist. 2020. № 47. P. 512–514. URL: https://moluch.ru/archive/494/108138/ (access date: 30.12.2024).
4. Sergeeva N.L. Psycho-physiological aspects of swimming / N.L. Sergeeva// Physical Culture and Sports. 2021. №3. P. 56-62.
5. Smirnov I.V. Physical activity and personal development / I.V. Smirnov // Bulletin of Pedagogy and Psychology. 2021.№12. P. 34-42.

A cutting-edge system for managing a professional team in real-time, akin to a virtual coach

UDC 796.35



Dr. Hab., Associate Professor **A.A. Polozov**
Dr. Phys.-Math., Professor **D.B. Berg**
Postgraduate student **N.A. Maltseva**
ИВ.В.А. Almomani
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: aa.polozov@urfu.ru

Received by the editorial office on 15.01.2025

Abstract

Objective of the study was to creating a dynamic game management system that operates in real-time for a professional team («Computer Coach»).

Methods and structure of the study. In the experimental phase of the research, a comparative evaluation of the efficiency of computer vision algorithms employed to analyze video footage of basketball games in the ASB Division championship in the Sverdlovsk region was conducted. The data obtained were used to assess the precision and performance of mathematical models designed to address the challenges of the control system.

Results and conclusions. The objectives of calculating the three-dimensional coordinates of players with an accuracy of 0.4 meters, identifying players, the ball, tracking players, categorizing teams of players, and recognizing numbers on jerseys were achieved. Without the use of neural networks, it was possible to identify 30 types of technical and tactical martial arts (TTA), a method for generating voice commands in real-time, and elements of communication with players were implemented. We estimate the potential impact of the implementation at 22-28% of the additional points scored, however, due to a number of technical constraints, it is not yet possible to fully utilize the project's potential. The authors are eager to collaborate with professional clubs to complete the project.

Keywords: *game management system, sports, coach, information technology, big data, machine learning, optimization, team effectiveness.*

Introduction. Computer vision is actively used in sports to engage viewers, analyze performance, identify movements, improve technique during visual control, adjust the accuracy of decisions, and create heat maps with data on team strategy. Computer vision has long been involved in refereeing matches at the level of recording the ball going out of bounds or crossing the finish line. For example, algorithms can track body position and provide feedback on the correctness of the exercises, as is done with YOLOv8. In addition, systems such as Hawk-Eye are used to improve the accuracy of refereeing decisions in tennis and football. Computer vision is used to create interactive elements in broadcasts, such as augmented reality, which provides viewers with live statistics and heat maps of players directly on the screen. However, for mass development, it is necessary to resolve issues of cost, economics, and data rights. Companies have emerged that are capable of implementing such solutions for the customer (ultralytics.com). This work is a continuation of the previously published work [1] on the «Computer Coach» project in basketball. We have managed to integrate computer vision into game management, but a number of technical difficulties are holding back the completion of the project.

In sports, computer vision is implemented in the SAP Sports One and Oracle Sports Cloud systems. They provide information about the movement of players on the field during a competition using GPS sensors, recording games and training from several angles. During the game, these records can be viewed by coaches to make immediate tactical adjustments and give instructions to players. After the game, coaches can use them for more detailed analysis, identify errors and develop new strategies.

TTA recognition presented in the SAP Sports One Match Intelligence, Oracle Sports Cloud Premier, IBM Watson Sports Analytics systems do not participate in the formation of a game management strategy, but only provide information to coaches for further decisions.

Objective of the study was to creating a dynamic game management system that operates in real-time for a professional team («Computer Coach»).

Methods and structure of the study. In the experimental phase of the research, a comparative evaluation of the efficiency of computer vision algorithms employed to analyze video footage of basketball games in the ASB Division championship in the Sverdlovsk region was conducted. The data obtained were used to assess the precision and performance of mathematical models designed to address the challenges of the control system.

Results of the study and discussion. A mathematical model of dynamic management of competitive activity in real time has been developed, providing high accuracy of results (more than 93%), prompt analysis of relevant information reflecting the dynamics of situational changes. The model includes a computer vision algorithm for calculating the coordinates of players, calculating three-dimensional coordinates of the ball, detecting players, the ball, tracking players, classifying teams of players, recognizing numbers on T-shirts. Ball detection at sports competitions is implemented using a neural network with the YOLOv8m architecture trained on a custom data set. As a result of training the model on this data set, it was possible to obtain metrics of completeness – 73% and accuracy – 93% (see table). The detection results are visualized in Figure 1.

Results of the trained segmentation network model based on the original dataset

Network architecture	Number of images	Box_Precision	Box_ Recall	Mask_ Precision	Mask_ Recall
yolov8n-seg.pt	349	0,92	0,6	0,79	0,52
yolov8s-seg.pt	349	0,9	0,7	0,8	0,58
yolov8m-seg.pt	349	0,93	0,73	0,78	0,63

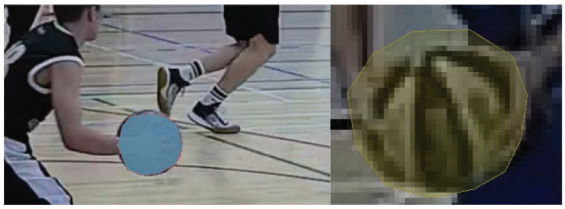


Figure 1. Segmentation mask of the found ball

The segmentation mask of the ball is then fed to the input of the 3D coordinate calculation module, based on the principles of projective geometry using camera parameters and multiple viewpoints of the ball, thus ensuring high reliability in case of occlusions, which are frequent and serious in team sports such as basketball or American football. The algorithm was upgraded to work in real time: instead of the computationally intensive operation of synchronizing frames from several cameras, a reference value was added - the diameter of the ball, which made it possible to use a single camera with a total accuracy of up to 40 cm. The algorithm was also expanded by a method for calculating the basic coordinate system based on the field markings and a spatial filter to exclude detections that go beyond the playing field. To identify and track athletes throughout the competition, a tracking system based on the ByteTrack algorithm was developed. Each player was assigned a unique identifier, which allows tracking their movements in real time. The ByteTrack algorithm, adapted for low frame rate sports videos (8 and 12 FPS), matches the current position of a player with his predicted location calculated using the Kalman filter. To evaluate the effectiveness of the proposed approach, a comparative study of the Deep Oc Sort, Oc Sort, Bot Sort and Strong Sort algorithms was conducted, applied together with various pre-trained models (Os Net, ResNet, Mobilenet) on standard datasets (MSMT17, Market1501, Duke). The experimental results presented in Figure 2 demonstrate that the Byte Track algorithm provides the highest accuracy of tracking athletes in real sports competition conditions.

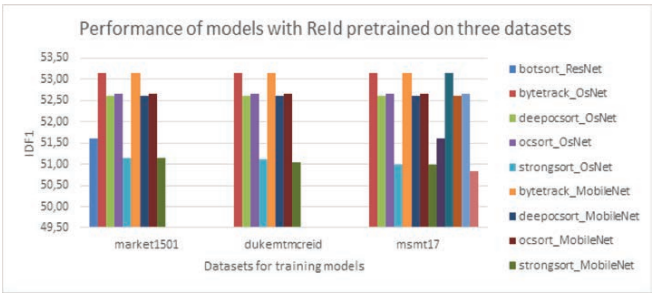


Figure 2. Quality of tracking methods

To identify the TTA, a list of indicators was developed: attack direction, attacking team number, index, ball possession, distance between players, exchange, speed of movement, ball position relative to the player, height and width of the box, defender position on the

line between the ball and the ring, change in direction of movement. This list allowed us to solve the problem of identifying the TTA without using artificial intelligence.

The PIRS technology [2] was used as a basic model for the decision-making system. The team and player ratings are used to evaluate the results of interaction between players and the team. The state of the system depending on the control actions at time t can be written as follows:

S=Si(t, PIRS)={(x, y) 0/i,(x, y) k/i, T(TTE),(N1, N2); ti}

Based on the model calculations, the system selects the best combination of actions from the database (300-1000 options). The optimal replacement, position on the field, and optimal number of single combats are selected individually at each moment in time.

The system uses headphones for audio prompts that are sent to all players simultaneously. There is no direct ban on headphones, so this will not interfere with its further operation.

To simultaneously broadcast prompts to several headphones, the VAC control panel, Audio repeater system was used, capable of transmitting sound from a computer to all headphones connected to it.

The necessary information sent to the players was pre-structured into the following groups of actions: substitutions; defensive exchanges; the most deviating indicator from the required one; attack combination. The most difficult aspect turned out to be the formation of prompts for attack combinations. The dataset contains over 500 combinations, which can have an individual name. To advance in this matter, it was decided to call the exchange and type of TTA. The work is shown using basketball as an example, but is applicable to all team sports.

C**onclusions.** 1. A mathematical model for managing a professional team game has been developed using a complex of neural networks, including computer vision algorithms based on video recording. The following tasks were solved: calculating the coordinates of players, calculating the three-dimensional coordinates of the ball, detecting players, the ball, tracking players, classifying teams of players, recognizing numbers on T-shirts. A method for calculating the coordinates of players using spatial transformation methods using reference points, which were the field markings, was also developed, which made it possible to estimate the coordinates of players with an error of 40 cm. A mathematical algorithm for recognizing the ball using a segmentation mask based on the Yolo architecture was created, with an accuracy of 94%. An algorithm for determining the location of the ball in the coordinate system of the playing space was also developed, using a segmentation neural network, coordinates of contour points in the image and transformation methods that allow obtaining 3D coordinates with an error of 10 cm. A comparative analysis of player tracking algorithms (DeepOcSort, OcSort, BotSort) was performed, among which ByteTrack showed the best result using the pre-trained OsNet model.

2. To identify TTA, the following indicators were used: attack direction, attacking team number, index, ball possession, distance between players, exchange, speed of movement, position of the ball relative to the player, height and width of the box, location of the defender on the line between the ball and the ring, change in direction of movement. An algorithm for their determination was created. A specialized recognition model was developed for each type of TTA. The PIRS mathematical model was used as a basic model for the decision-making system, using a system of mutual ratings of players and teams based on won single combats.

3. To develop the practice-oriented technology «Computer Coach» in basketball, an algorithm of its operation was created, technical problems were solved (camera parameters, voice communication, etc.), a method for generating voice commands in real time, elements of communication with players were implemented, the «Computer Coach» project was tested using the example of games of student teams, an excess of results by 9 points was obtained, which indicates the advantage of the automated system over expert coaching assessment.

The selected methods of computer vision and algorithms for determining TTA allowed us to implement the computer trainer project as an automatic system for managing the game of professional teams in real time.

References

1. Polozov A.A., Kudryavtsev I.V., Karmanov A.A., Maltseva N.A. Golosovoye upravleniye komandoy kompyuternym trenerom v basketbole (PIRS online). Teoriya i praktika fizicheskoy kultury. 2022. No. 11. pp. 54-56.
2. Polozov A.A., Golshteyn S.L., Maltseva N.A. et al. Kachestvo metodov trekinga s reindefikatsiyey obyektov. Vestnik DGU, Tekhnicheskiye nauki. 2024. Vol. 51. No. 3. pp. 103-109.

The process of creating algorithms for fundamental taekwondo training in the wtf style

UDC 796.856.2

PhD, Associate Professor **G.I. Semenova**
PhD, Associate Professor **I.V. Erkomayshvili**
Postgraduate student **G.A. Ryabov**
Master student **K.K. Pshenitsyn**
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: galsem@list.ru

Received by the editorial office on 12.01.2025

Abstract

Objective of the study was to determine the perspective of instructors regarding the implementation of algorithms in the teaching of fundamental techniques in Taekwondo.

Methods and structure of the study. The research was carried out through a survey administered to taekwondo instructors. The survey consisted of both closed and open-ended questions designed to gauge the instructors' experience with the algorithmic approach, their perception of it, and their assessment of its effectiveness. A total of 22 instructors participated in the survey.

Results and conclusions. A significant proportion of taekwondo instructors have been observed to employ the algorithmic approach, which suggests its potential effectiveness in teaching fundamental techniques and enhancing athletic performance. However, there are still challenges to implementing the algorithmic method in training, such as time constraints, a shortage of methodological resources, and a lack of motivation among athletes. These issues require further investigation to enhance the quality of athletes' training. This article will be of interest to coaches, instructors, and anyone seeking to improve their WTF taekwondo training methods.

Keywords: *algorithmization, training, basic strokes, taekwondo WTF.*

Introduction. Modern development of sports requires the introduction of innovative approaches to teaching and training athletes, which is especially relevant for technical sports such as WTF taekwondo. One of such promising technologies is the algorithmization of the learning process [1]. Algorithmization is understood as the sequential construction and implementation of steps aimed at mastering complex technical actions [1, 5]. Scientific research in the field of training athletes in taekwondo at the initial stages indicates the need for a systematic approach aimed at developing basic technical skills [3]. In particular, issues of teaching unsupported complex-coordination actions, which are the basis of taekwondo, require the use of scientifically based methods such as algorithmization [2]. Foreign studies emphasize the effectiveness of algorithmic prescriptions and artificial intelligence for optimizing the training process [4-8].

A structured learning process is a key element in mastering taekwondo technique, especially when it comes to basic strikes. This process includes several stages: demonstration, explanation, practical implementation and analysis. Each of these stages plays an important role in the formation of technical skills in athletes. The need for algorithmization of teaching basic strikes in taekwondo is due to the relevance of forming precise technical skills at the initial stage of training. However, this approach has not been studied deeply enough in domestic scientific literature, especially in taekwondo, despite its successful application in practice by coaches and teachers [1].

Objective of the study was to determine the perspective of instructors regarding the implementation of algorithms in the teaching of fundamental techniques in Taekwondo.

Methods and structure of the study. The survey was conducted using a questionnaire of taekwondo coaches. The questionnaire included closed and open questions aimed at identifying the experience of coaches in using the algorithmic approach, its perception and assessment of effectiveness. The survey involved 22 coaches working in sports schools and clubs in Yekaterinburg and the Sverdlovsk region (SSh No. 19, SSh No. 16, SSh in taekwondo).

Results of the study and discussion. A survey was conducted among taekwondo coaches, the purpose of which was to find out whether they use an algorithmic approach in the process of teaching basic strikes. The results of the survey show that the majority of coaches (90,9%) actively use an algorithmic approach in their training practice (Figure 1). This indicates a high level of awareness among coaches of the importance of structured teaching of basic strikes, which, in turn, can contribute to improving the technique and results of athletes.

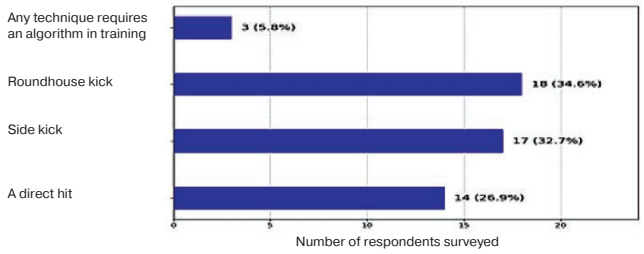


Figure 1. Basic strokes used with the help of algorithmization

Figure 1 shows that coaches most often use algorithmization when teaching turning kicks (34.6%), side kicks (32.7%) and straight kicks (26.9%), which indicates that coaches understand the importance of prioritizing these kicks. Most coaches (90.9%) believe that algorithmization of training has a positive effect on the results of their athletes (Figure 2).

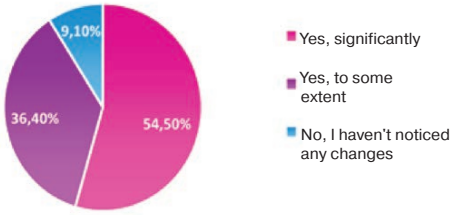


Figure 2. The impact of using algorithms on improving sports results

More than half of the surveyed coaches (54,5%) noted that they use algorithms precisely at the stage of initial training of athletes (Figure 3). This is due to the fact that at this stage it is important to lay the foundations of technique and develop basic skills.

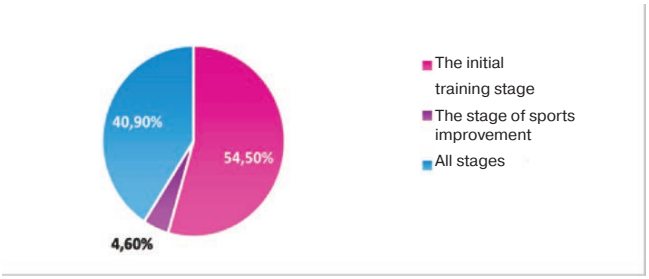


Figure 3. Use of algorithms at the stages of athletes' training

At the same time, a significant part of coaches (40,9%) indicated that they use algorithms at all stages of athlete training. This suggests that many coaches consider algorithms as a universal tool that can be adapted to different stages of training: from basic training to the level of high sportsmanship. Figure 4 presents data on the difficulties in implementing the algorithmic approach to teaching basic strikes in WTF taekwondo. Lack of time for training is the most frequently noted problem (36,7%). Lack of materials or methods – this shortcoming was noted by (33,3%) coaches. Low motivation of athletes is the third most significant problem (23,3%). Difficulties in explaining the technique are the least common difficulty (6,7%).

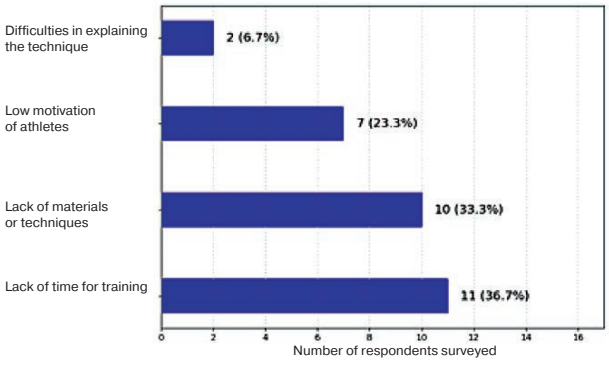


Figure 4. The main difficulties in implementing the algorithmic approach

During the survey, additional resources necessary for the algorithmization of training were identified. The survey results show that video lessons and training seminars were the most in demand among trainers as

necessary resources for improving the algorithmization of training. Methodological materials are also significant, but less in demand compared to the first two categories. The number of participants who consider all of the above resources equally important is significantly smaller (Figure 5).

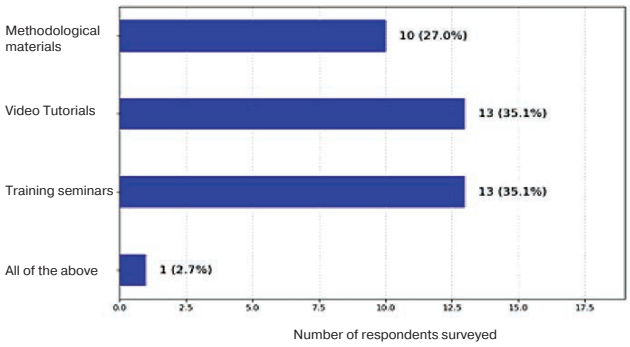


Figure 5. Additional resources for improving the algorithmization of training

Conclusions. The conducted research revealed a high percentage of use of the algorithmic coefficient of the taekwondo coach, which ensures its possible effectiveness in teaching basic strikes and improving the sustainability of results. The main problems of the algorithmic method in training remain: lack of time, lack of methodological materials and motivation of athletes, which requires additional research aimed at improving the quality of training taekwondo athletes.

References

1. Rapoport L.A. Algoritmizatsiya v tekhnicheskoy podgotovke yunykh konkobezhtsev na etape nachalnoy sportivnoy spetsializatsii. PhD diss. Omsk, 1987. 196 p.
2. Rogozhnikov M.A. Obucheniye yunykh tkhekvondistov bezopornym slozhno-koordinatsionnym tekhnicheskim deystviyam. PhD diss. St. Petersburg, 2016. 187 p.
3. Simakov A.M., Bakulev S.E., Chistyakov V.A. Aktualnyye voprosy podgotovki v tkhekvondo na nachalnom etape uchebno-trenirovochnogo protsessa. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2014. No. 1 (107). pp. 148-150.
4. Wang P. Evaluation and analysis of effectiveness and training process quality based on an interpretable optimization algorithm: The case study of teaching and learning plan in taekwondo sport. Applied Artificial Intelligence, 37 (1).
5. Abhariana S.E., Abdolvand N., Abharianc T.E., Memari Z. Performance prediction of taekwondo athletes using machine learning. Journal of Sports Analytics. 2023. Vol. 9. No. 3. pp. 378-389.
6. Shin M., Lee D., Chung A., Kang Y. When Taekwondo Meets Artificial Intelligence. The Development of Taekwondo Techniques. Sports Technology. 2023. Vol. 7. No. 1. pp. 45-60.
7. Huipeng L. Martial Arts Competitive Decision-Making Algorithm Based on Artificial Intelligence. Journal of Sports Engineering and Technology. 2021. Vol. 235. No. 4. pp. 513-528.
8. Pedro C. Cyber-Physical System for Evaluation of Taekwondo Athletes. Machines. 2023. Vol. 11. No. 2. pp. 234-240.

The impact of plyometric exercises on the physical fitness of amateur boxers in Jordan

UDC 796.83

Postgraduate student **M.A. Al-Shbul (Jordan)**
PhD, Professor **T.I. Myasnikova**
Master student **S.T. Vorobyev**
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: ggshsuxhss.1997@gmail.com

Received by the editorial office on 20.01.2025

Abstract

Objective of the study was to assessment of the impact of plyometric exercises on the explosive power of amateur boxers in Jordan.

Методика и организация исследования. A study was carried out to evaluate the effectiveness of a training regimen employing the plyometric technique on the explosive power of 40 amateur boxers from Jordan.

Results and conclusions. The findings of the pedagogical experiment demonstrate that the boxers' impact force improved by 25% over a two-month period, their impact velocity increased by 12%, and their explosive strength in their arms and legs improved by 18% and 15%, respectively. These results suggest that plyometric training can positively impact a range of indicators related to explosive strength in boxers. Therefore, it is essential to incorporate plyometric training into athletes' training programs to enhance their performance and achieve superior athletic outcomes.

Keywords: *boxing, physical training, amateur boxers, plyometric training, explosive power, amateur sports clubs.*

Introduction. Plyometric training is widely used to improve explosive strength and muscle power in various sports, including team sports and martial arts. Thus, M. Slimani et al. in their systematic review emphasized that plyometric exercises contribute to a significant improvement in the physical performance of athletes. R. Ram rez-Campillo et al. in their meta-analysis showed the effectiveness of plyometric training in young basketball players, confirming the versatility of this method in improving physical performance.

The study of I. Loturco et al. demonstrated the positive effect of plyometric exercises on the sprinting abilities of high-level football players. Given the need for rapid movement and quick reaction of a boxer in a fight, studying the results of this study can be useful for improving the physical training of boxers. G. Markovic and P. Mikulic noted that plyometric exercises improve neuromuscular function and increase the performance of athletes by increasing the speed and strength of muscle contractions. J. Moran et al. studied the effects of combined plyometric and strength training, revealing a significant increase in athletic performance in young football players. The provisions of the methodology proposed by the authors can also be used to develop the strength and power of punches in boxing. Explosive power is especially important in sports that require fast and powerful movements, which include boxing. One of the key aspects of training boxers is to improve the effectiveness of punches. Punch force, speed of execution and coordination of movements play a decisive role in achieving high athletic results in boxing.

Despite the widespread use of plyometric training in various sports, its effect on boxers' performance has not been sufficiently studied [2, 3]. In this regard, there is a need to develop and implement a training program based on plyometric exercises in order to im-

prove the physical performance of boxers in amateur sports clubs in Jordan.

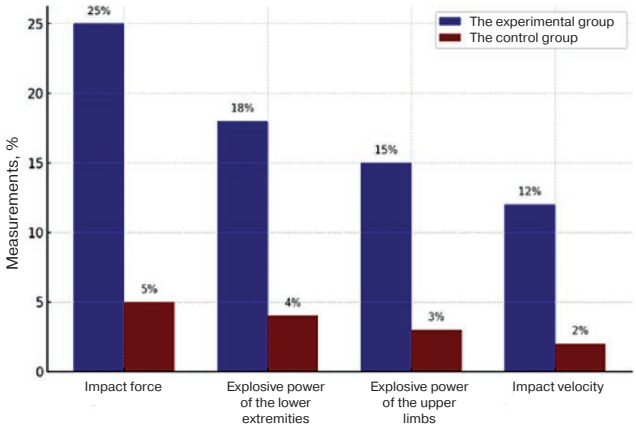
Objective of the study was to assessment of the impact of plyometric exercises on the explosive power of amateur boxers in Jordan.

Methods and structure of the study. Participants: 40 boxers (aged 18–25) from four amateur sports clubs in Jordan. Participants were randomly assigned to the experimental (n=20) and control (n=20) groups. The selection criteria were age, at least two years of boxing experience, absence of injuries, and consent to participate in the study. This ensured sample homogeneity and reliability of the data obtained. The educational experiment lasted eight weeks. The experimental group trained according to a specially developed program based on the recommendations of modern research in the field of plyometric training. Training was conducted three times a week for 75 minutes. The main part of the program included plyometric exercises: vertical jumps without weights, jumps onto a 50 cm high box, arm curls and extensions with hands off the floor, throws of a 3 kg medicine ball, sideways jumps over hurdles, and 20 m sprint accelerations. The loads were progressively increased by 10% every two weeks, increasing the intensity and number of repetitions, which contributed to the continuous stimulation of muscular adaptation. The control group training included endurance running, sparring, and work with punching bags and pads, as well as technical preparation.

The physical parameters of the boxers were assessed before and after the eight-week program. Punch force was measured using a force transducer on the punching bag, which allowed the power of each punch to be accurately determined. To assess the explosive power of the lower limbs, athletes performed a vertical jump test using a force platform, and the explosive power of the upper limbs was assessed by throwing a 3 kg medicine ball for a distance. Punch velocity was determined by the number of punches on the bag in ten seconds.

Statistical analysis was performed using the SPSS version 25 package. The t-test for dependent and independent samples was used, the significance level was set at $p<0.05$. The effect size (d) was calculated to assess the practical significance of changes. The need to calculate the effect size is also due to the small sample sizes in this study, which may distort statistical indicators [1].

Results of the study and discussion. At the end of the eight-week program, the experimental group demonstrated significant improvements in all assessed parameters (see figure). The punching force increased by 25% ($p<0,001$, $d=2,0$), which significantly exceeds the result of the control group, which increased by only 5% ($p=0,05$, $d=0,4$). The punching speed in the experimental group increased to a lesser extent, but still significantly – by 12% ($p<0,001$, $d=1,4$), and in the control group – only by 2% ($p=0,07$, $d=0,2$). The dynamics of both parameters in the experimental group revealed reliable differences and a large effect, while in the control group only reliable trends and insignificant differences were found, as well as a small effect.



Percentage Changes in Explosive Power Stats of Jordanian Amateur Boxers

The explosive power of the lower limbs in the experimental group increased by 18% ($p<0,001$, $d=1,7$), while in the control group it increased only by 4% ($p=0,04$, $d=0,5$). The explosive power of the upper limbs improved by 15% ($p<0,001$, $d=1,5$) in the experimental group and only by 3% ($p=0,06$, $d=0,3$) in the control group. Thus, reliable differences and a large effect were revealed in the dynamics of explosive power of both legs and arms of boxers in the experimental group, while in the control group, the differences in explosive power of arms were reliable and the training effect was average, and in the indicators of explosive power of legs, the differences were insignificant and the effect was small. The obtained results indicate the high efficiency of the plyometric training program for developing the strength and speed of punches and explosive power in boxers. Significant improvements in the experimental group confirm the findings of previous studies that have shown positive effects of plyometric exercises on neuromuscular adaptations and

athletes' performance.

Improvements in punching power and explosive limb strength can presumably be explained by increased neuromuscular stimulation during plyometric exercises and increased efficiency of muscle energy supply. Plyometric exercises contribute to the development of muscle fiber speed of contraction, which is critical for the execution of fast and powerful punches in boxing. The results of the study are consistent with the findings of R. Ram rez-Campillo et al. and J. Moran et al., confirming the versatility and effectiveness of plyometric training in various sports.

Despite the positive results, the conclusions of the study cannot be considered definitive. The sample size of 40 participants is relatively small and may limit the generalizability of the results to a wider population of boxers. Also, the eight-week duration of the study provides information on the short-term effects of the program, but does not allow conclusions to be drawn on the long-term sustainability of the achieved improvements. Furthermore, the lack of biochemical and physiological measurements limits the understanding of the internal mechanisms of the body's adaptation to plyometric training.

Conclusions. The results of the study showed that the plyometric training program significantly improved the physical performance of amateur boxers. The significant increase in punching power, explosive power, and punching speed in the experimental group confirms the effectiveness of using plyometric exercises in training amateur boxers. Future research could be aimed at expanding the generalizability of the results by conducting a study with a larger sample and including boxers of different levels of training; continuing the implementation of the educational experiment to study the long-term effects of plyometric training, including follow-up monitoring of athletes, which will help to understand the sustainability of the achieved improvements. Finally, additional analysis of biochemical and physiological changes under the influence of plyometric training may provide a deeper understanding of the mechanisms of adaptation and the effectiveness of this method.

References

1. Barnikova I.E. Ispolzovaniye informatsionnykh tekhnologiy dlya otsenki razmera effekta v biomekhanicheskikh issledovaniyakh. Trudy kafedry biomekhaniki Universiteta im. P.F. Lesgafta. 2017. Issue XI. pp. 6-11.
2. Lukyanenko V.P., Volikov R.A., Khezhev A.A. Spetsialno-silovaya podgotovka v bokse. Mir nauki, kultury, obrazovaniya. 2018. No. 1 (68). pp. 46-47.
3. Prokhorov Yu.M., Yanovskiy V.E. Bazovyye kharakteristiki i sredstva razvitiya vzryvnykh sposobnostey boksera. Fizicheskaya kultura kak osnovopolagayushchiy faktor strategii razvitiya gosudarstva, obshchestva, lichnosti. Proceedings of the International scientific-practical conference, Vitebsk, May 21–22, 2020. Vitebsk: VGAVM publ., 2020. pp. 66-69.

The synergy between the athlete's functional systems and their training regimen is essential for achieving peak athletic performance

UDC 796

Dr. Hab., Professor **Sh.Z. Khubbiev**[1, 2]
PhD, Associate Professor **O.V. Kostromin**[3]
PhD, Associate Professor **N.A. Zinovyev**[4]
N.D. Alekseeva[4]
[1]Saint Petersburg State University, St. Petersburg
[2]The Military Institute of Physical Training, St. Petersburg
[3]Saint-Petersburg Mining University of Empress Catherine II, St. Petersburg
[4]Baltic State Technical University "VOENMEH" named after D.F. Ustinov, St. Petersburg

Corresponding author: khubbiev@gmail.com

Received by the editorial office on 21.01.2025

Abstract

Objective of the study was to recognize the holistic approach to sports training, viewing the athlete's body as a unified and interconnected system.

Methods and structure of the study. The study involved the examination and synthesis of scholarly and methodological sources. The research was conducted over the period of 2022 to 2024, employing a range of techniques, including literature analysis and synthesis, deductive reasoning, inductive reasoning, extrapolation, and content analysis.

Results and conclusions. It is clear that sports training is a pedagogical system that operates as a self-regulating and self-organizing mechanism, maintaining the athlete's body in a state of balance and enabling them to adapt to physical exertion. Sports training triggers a series of processes in the athlete's body: 1. Afferent synthesis: The athlete's body receives information about the current state and conditions. 2. Decision-making: Based on the information received, the athlete's body makes a decision about how to respond. 3. Formation of an acceptor of action results: The athlete's body creates a mental representation of the desired outcome. 4. Fitness as a result: The athlete's body performs the desired action. 5. Reverse afferentation: The athlete's body receives feedback about the outcome of the action. 6. Comparison and evaluation of the result in the acceptor of action results: The athlete's body compares the actual outcome with the desired outcome and evaluates the difference. 7. Correction: Based on the evaluation, the athlete's body adjusts their actions to achieve the desired outcome. 8. New result level of fitness: The athlete's body achieves the programmed adaptive result. The ultimate objective of all these processes is to achieve the programmed adaptive result.

Keywords: *functional system, integration, organismal level, sports training.*

Introduction. Sports training is designed to improve the athlete's body. Its effectiveness depends on how much it takes into account the complexity and functionality of the body. In accordance with the principle of W. Ashby in control systems, one of the main indicators of the complexity of the system is its diversity [9]. This principle determines the degree of coordination of various control parameters of the system to achieve the set goals in the conditions of possible changes in the system. In this regard, sports training should be considered as a system where obtaining a useful adaptive result - the expected training is based on the integrative interaction of factors creating the functional readiness of the body.

Objective of the study was to recognize the holistic approach to sports training, viewing the athlete's body as a unified and interconnected system.

Methods and structure of the study. An analysis and generalization of scientific and methodological literature was carried out. The study was conducted during 2022-2024 using the following methods: analysis and generalization of literature, deduction, induction, extrapolation, content analysis.

Results of the study and discussion. Based on the theory of the functional system of P.K. Anokhin [2], when constructing sports training as a complex functional system, it is necessary to create it as a complex of self-regulating, self-organizing, dynamic functional

subsystems. They are integrated in order to obtain a useful adaptive result. In this case, the interaction of selectively selected functions of organs and systems of the body acquires the character of mutual assistance to achieve such a result. Thus, sports training is a pedagogical functional system, it functions as a self-regulating and self-organizing mechanism for maintaining homeostasis in the athlete's body and ensuring its adaptation to physical activity. Functional subsystems that exhibit their activity at levels below the organismic level also act in the same way. The achievement of an adaptive useful result of a functional system is served by its architectonics. It includes a number of successive stages: afferent synthesis; decision-making; acceptor of the result of the action; assessment of the achieved result; efferent synthesis and reverse afferentation. Each functional system has an apparatus for assessing information - an acceptor of the result of an action, it forms information models and a response reaction of the required result based on the available experience [1]. These stages are closely related to the integration processes, their essence reflects the methods of working with diverse information. Information is generated during the activity of the organism as an integral functional system, as well as its organs and systems. Analyzers supply external information. Further, the integration processes are associated with the processing of this information in the organism, which triggers physiological processes that activate the functional system of the executive organs and systems of the organism. This is accordingly reflected in the training and competitive activity of the athlete. As a result, a programmed sports result is expected.

The results of sports training as a functional system can be presented by separate indicators: the functional state of the athlete; the results of training sessions (levels of intellectual, physical, technical, tactical, psychological, spiritual and moral, integral preparedness). The result of the athlete's competitive activity can be presented by the corresponding indicators of the functioning of the athlete's body at different levels of his activity. All this can be calculated taking into account the cycles of sports training. The final adaptive result of sports training can be records of different levels, absolute results, places taken, victory in competitions, etc.

The body is a coordinated integration of many functional systems, some of which, through self-regulatory activity, provide homeostasis of internal environment indicators, others - adaptation of the body to the conditions of the external environment, training, competition. Some functional systems are genetically determined, others are formed in ontogenesis during the interaction of the body with internal and external environmental factors, i.e. on the basis of training [5], i.e. sports training. Sports training forms the parameters of an adaptive useful result in the body. During training and competition, it is not individual muscles, organs, systems that function, but the whole organism as a functional megasystem, its components are a multitude of functional systems that ensure the implementation of tactical and technical techniques and actions as forms of manifestation of the athlete's physical abilities. Following P.K. Anokhin, we note that the inclusion of an adaptive result in the analysis of sports training changes the generally accepted understanding of the system in general and allows us to consider it in a new way. All the activity of the system and its changes must be presented in terms of the result. This further emphasizes its decisive role in the behavior of the system. This activity can be expressed in a number of questions reflecting the various stages of the formation of the system: What result should be obtained? When exactly should the result be obtained? What mechanisms should be used to obtain the result? How does the system verify the sufficiency of the result obtained? These questions express everything for which the system is formed [1].

The athlete's behavior is assessed taking into account a number of adaptive useful results: internal constants of the body, interconnected indicators of homeostasis that determine normal metabolism; results of adaptation to the external environment that allow satisfying internal biological needs and preserving life; results of group activities in order to satisfy biological needs; results of social activity [5].

According to the theory of the functional system of P.K. Anokhin, the body forms a new functional system to perform any activity. For complex systems, for example, sports training, complexes of functional systems are formed in the body, the final result of which determines in which direction and in what combinations private mechanisms of integrative activity will be integrated [2]. As a result, the athlete is ready to win the competition, set a record, take his rightful place. This is facilitated by the useful adaptive results achieved during sports training.

According to the theory of the functional system, behavior is a set of actions of the body that determine

the future result of behavior, and not a consequence of previous external and internal stimuli. The intracerebral organization of behavioral processes provides an advanced reflection of reality [6]. This provision underlies the athlete's sports training.

Sports activity is a set of motor actions of an athlete, they are aimed at the implementation of sports skills, abilities, and abilities of the highest level in the chosen sport and the achievement of a programmed sports result as the highest manifestation of the results of the athlete's training and competitive activity. From the standpoint of the theory of the functional system, the final results of sports activity are the products of the integration activity of all functional systems of the whole organism. The integration of the internal processes of the organism and environmental factors into the functional systems of the athlete's purposeful behavior occurs due to sports results, which form these systems. [8].

Conclusions. Sports training is a pedagogical functional system that functions as a self-regulating and self-organizing mechanism for maintaining homeostasis in the athlete's body and ensuring its adaptation to physical activity. Sports training launches in the athlete's body: afferent synthesis, decision-making, formation of an acceptor of action results, it is formed by: fitness as a result - reverse afferentation – comparison and evaluation of the result in the acceptor of action results – correction – new result, fitness level. The ultimate goal of all system processes is to achieve a programmed adaptive result.

References

1. Anokhin P.K. Uzlovyye voprosy teorii funktsionalnoy sistemy. Moscow: Nauka publ., 1980. 160 p.
2. Anokhin P.K. Biologiya i neyrofiziologiya uslovnogo refleksa. Moscow: Meditsina publ., 1968. 546 p.
3. Rudenko G.V., Dubrovskaya Yu.A., Bobrov I.V. Metodika opredeleniya psikhofiziologicheskogo potentsiala organizma. Teoriya i praktika fizicheskoy kultury. 2018. No. 4. pp. 8-10.
4. Sudakov K.V., Kotov A.V., Loseva T.N. Fiziologiya. Osnovy i funktsionalnyye sistemy. Moscow: Meditsina. Leningradskoye otdeleniye publ., 2000. 781 p.
5. Sudakov K.V. Obshchiye predstavleniya o funktsionalnykh sistemakh organizma. Osnovy fiziologii funktsionalnykh sistem. K.V. Sudakov [ed.]. Moscow: Meditsina publ., 1983. pp. 6-26.
6. Sudakov K.V. Izbrannyye trudy. Moscow: GU NII normalnoy fiziologii im. P.K. Anokhina RAMN publ., 2007. No. 1. 343 p.
7. Filosofskiye aspekty teorii funktsionalnykh sistem. Printsipialnyye voprosy obshchey teorii funktsionalnykh sistem. Moscow: Nauka publ., 1978. pp. 49-106.
8. Fudin N.A., Vagin Yu.E. Analiz sportivnoy deyatelnosti s pozitsii teorii funktsionalnykh sistem. Sechenovskiy vestnik. 2016. No. 3 (25). pp. 34-45.
9. Eshbi U.R. Vvedeniye v kibernetiku. Moscow: IL publ., 1959. 788 p.
10. Eshbi U.R. Konstruktsiya mozga (Proiskhozhdeniye adaptivnogo povedeniya). Moscow: IL publ., 1962. 398 p.

The role of young scientists in the realm of physical culture and sports as a gauge of the environmental sustainability of university communities

UDC 796.011.2+316.74:001

PhD, Associate Professor **D.Yu. Narkhov**
K.G. Zhiltsova
PhD, Associate Professor **E.N. Narkhova**
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: d_narkhov@mail.ru

Received by the editorial office on 23.01.2025

Abstract

Objective of the study was to analysis of the factors that contribute to the reproduction of institutional and regulatory frameworks for scientific endeavors in the field of physical culture and sports, with a focus on their role in fostering the growth and preservation of youth-oriented scientific pursuits.

Methods and structure of the study. A theoretical examination of the scholarly work of the higher education system has been conducted, with the addition of information on the involvement of young people in the process of defending their dissertations in the field of physical culture and sports, as well as insights from expert interviews in the Ural Federal District.

The experts chosen for this study were academic and administrative personnel in the field of physical culture and sports, with a background in teaching and collaborative research with students.

Results and conclusions. In the realm of governance, the process of unlocking the potential of youth science is founded on constructive forms of collaboration between university academic communities. The task of their systemic integration can be accomplished through the prism of value-driven interaction, rooted in the internalized social attitudes of the traditions of Russian education. In the long term, it is essential to reevaluate the institutional frameworks of management and administration, aiming to bridge or at least mitigate the divisions between communities. Within the university science of the physical culture and sports domain, it appears crucial to establish a "niche" for the sustainable growth of the scientific university ecosystem, fostering conditions for its qualitative reproduction through the harmonization of the interests of all stakeholders.

Keywords: *youth science, physical education and sports, university educational communities, interaction, social ecosystem.*

Introduction. Scientific activity in higher education is positioned as the second mission after educational activity. Research of various aspects of human social existence «including the sociology of physical culture and sports, allows a person to find ... ways to solve industry-specific social problems» [7, 103 p.]. In this aspect, the problem of reproduction of scientific personnel actualizes the issues of organizing scientific activity in the university space, first of all, support and development of youth science. Changes in the performance indicators of scientific and pedagogical workers, the dominance of formal parameters are accompanied by a lack of stability in the development of science and its support at the institutional level. The prolonged unstable situation has dramatically affected the characteristics of university educational communities: scientific and pedagogical workers (SPW), students, administrative and managerial workers (AMW). This transformation is presented in the works of leading researchers, within the framework of sociological science, M.K. Gorshkov [4], G.E. Zborovskiy and P.A. Ambarova [6] and others, including a number of aspects of the involvement of the named communities in scientific activities [12; 13]. Within the framework of

pedagogical sciences, N.V. Peshkova and L.I. Lubysheva [10, pp. 59-95] drew attention to the problem of interaction from the standpoint of managing student sports entities. At the same time, the problematic field of prerequisites for the involvement of young people in scientific research activities in the field of physical education and sports seems to be poorly studied.

Objective of the study was to analysis of the factors that contribute to the reproduction of institutional and regulatory frameworks for scientific endeavors in the field of physical culture and sports, with a focus on their role in fostering the growth and preservation of youth-oriented scientific pursuits.

Methods and structure of the study. A theoretical examination of the scholarly work of the higher education system has been conducted, with the addition of information on the involvement of young people in the process of defending their dissertations in the field of physical culture and sports, as well as insights from expert interviews in the Ural Federal District.

The experts chosen for this study were academic and administrative personnel in the field of physical culture and sports, with a background in teaching and collaborative research with students.

Results of the study and discussion. Research activities in the modern Russian education system are determined by the concept of educational policy as a whole, the goals and objectives of the scientific activities of the organization in accordance with its status. «With regard to universities, it should be noted that scientific work is carried out by ... employees of departments, but for most of them, scientific activity is a secondary form of professional work, the main one is considered to be teaching and scientific supervision of postgraduate students» [4, 249 p.].

The introduction of independent assessment of qualifications (IAQ) of university teachers was aimed at «a criteria-oriented inventory of the qualifications of teachers» [11, 122 p.]. In the context of the dispersion of university communities, the IQA system, aimed at optimizing the activities of the NRP, optimized the activities of administration and management. However, in practice, researchers prove an increase in the scale of «precarization in the field of education» [1, 104 p.]. The general situation in university science, which has found itself in the grip of chronic underfunding, institutional, bureaucratic and scientometric traps [5], is also reflected in the research activities of university communities in the field of physical culture and sports. The instability of objective and formal criteria in the institutional plan transfers the potential for activating scientific activity to the subjective plane. The presence of personal interest of a teacher, the implementation of his potential can be embodied in the creation of scientific directions, student scientific societies, initiative research, etc. Thus, thanks to the significant efforts of V.R. Malkin and L.N. Rogaleva [8], the direction of sports psychology was created at UrFU. The logical result of its development was the creation of a specialized master's and postgraduate programs, the registration of a new scientific journal «Topical Issues of Sports Psychology and Pedagogy» (ISSN 2782-5930), and its inclusion in the «List of the Higher Attestation Commission».

The effectiveness of the presence and development of youth science in the system of higher education is the result of a combination of objective conditions and subjective factors. Subjective factors depend on the cognitive potential of the individual and the motivational component, which can change under the influence of objective conditions in the unstable conditions of permanent reform of higher education. M.K. Gorshkov notes the «mechanical clash of two value systems» [3, 172 p.], in which «shock therapy hit science and education hard» [3, 368 p.], as a result of which the motivational dispersion of both the communities themselves and the individual positions of people and individual groups included in them increased. As a result, conditions have been created for inter-community disunity in university science.

The activity of individual academic staff leads to local, albeit very significant, results of supporting youth science. «I teach the basics of scientific and methodological activity, sports metrology and a project workshop on organizing the conduct of scientific research. And all this in the second year [...]. Students are beginning to understand what science is. Some will go further, some will not. I have a lot of people who want to now. [...] I am preparing a team for a conference, for the Olympics [in physical education], if they went, they brought back a bunch of cups, diplomas, published articles» (I-1, female, SPW, over 40 years of experience working with students). However, underestimation of such work by the AMW, misunderstanding of the real scientific needs of SPW and students, negatively affects the motivation of both students and SPW for joint scientific practices. Student science is more often underfunded than «adult» science, which leads to non-institutional forms of interaction between communities. Thus, for managers, student trips to conferences

with the widespread online participation system seem like an irrational waste of funds. But students see such trips as a real opportunity to interact with colleagues, teachers, including in an informal setting. As a result, «students go to conferences at their own expense. They don't pay for their tickets. And this happens every time. [...] We look for loopholes [...] Bring receipts for shoes, for clothes. They will give you money for this. You will travel on it» (I-2, female, SPW, experience of working with students for over 30 years). Such situations, replicating from year to year, create a "field of rejection" of young people from science.

Another significant factor preventing young people from becoming involved in science is that this type of activity is becoming an instrumental value. Young researchers often see science as a means of building a portfolio, guided by economic feasibility rather than scientific interest. As a result, students' scientific internships are curtailed after they receive their diploma, and only a few of the 12–15% of students who initially showed an interest in science in "sports specialties" defend their PhD dissertations. Thus, in the specialties of physical education and sports (5.8.4., 5.8.5, 5.8.6), there are currently 18 dissertation councils operating in Russia, three of which are in the Urals Federal District (D 311.005.XX in Chelyabinsk, D 212.274.XX in Tyumen, and UrFU 5.8.11.25 in Yekaterinburg). This means that defending academic degrees is relatively easy. However, for the period 2022-2024, only one dissertation was defended in these three councils by candidates under the age of 35. The discrepancy between the attitudes, interests, and motivations of the educational communities of the university not only complicates the achievement of the goals and objectives embodied in scientometric indicators, but also generally negatively affects the functioning of scientific activity in universities. At the same time, a significant part of managers, acting within the framework of the concept of managerialism, does not see the need to optimize inter-community interaction. A necessary condition for achieving the goals of any system is the consistency and stability of relations between the structural elements in educational activities (educational organization). It is through the category of interaction that the researchers of poly-subject management at the university N. V. Peshkova and L. I. Lubysheva define the specifics of the educational space of the university – «a specially organized space of integrative interaction of subjects of the educational process» [10, 48 p.].

Integrity, cooperation and non-conflict interaction of the scientific and pedagogical workers (SPW), students and the AMW should also form the basis of research activities in the field of physical education and sports. The idea of a stationary equilibrium of a scientific system can be based precisely on ecology as a principle of interaction corresponding to a given social type of system. The ecology of a social system is manifested in ensuring its stable functioning and counteracting its destruction and is «understood as a characteristic of the favorable environment» [2, 361 p.]. For different types of systems, ecology can consist of competition (interspecific or intraspecific) based on goal-rational action, or in cooperative relations - mutual assistance based on value-rational interaction, understanding that the main thing in science is interest, that «the main satisfaction comes from the creative process itself» [9, 7 p.]. The ideological pragmatism of Western civilization, in which the actor-manager (according to T. Parsons) determines the most effective means of achieving the goals of publication activity, participation in research, etc., is based on goal-rational interaction (according to M. Weber). Quantitative indicators stimulate the degree of activity in a certain period, being an external motivational factor. External determination is not stable, since it may not correspond to interests, potential, etc. In addition, managerial dysfunctions, such as ignoring procedural theories of motivation (equity theory, expectation theory) aggravate this situation. Internal motivation is less dependent on changes in system parameters, which is reflected in the qualitative parameters of scientific activity. It should be noted that the main feature of the ecological friendliness of a social system is the unity of interconnected elements with functional differentiation in the organization. It is the differentiation of elements in combination with the principle of progressive specialization that ensures not only the stability of the system, but also its development. The properties of a social ecosystem imply self-reproduction based on the orderliness of the structure, ensuring its integrity based on the internal regulation of the interaction of its constituent elements, promoting the continuity and succession of the system. In this concept, the potential of scientific activity and the development of youth science presupposes collective interaction within the framework of the creation and development of scientific directions and schools, since «the building of science is not built by one generation ... science is a collective monument» [9, p. 7].

Conclusions. In the context of manageability, the process of realizing the potential of youth science is based on constructive forms of interaction between university educational communities. The function of their systemic integration can be realized on the basis of value-rational interaction of internalized social attitudes of the traditions of Russian education in tactical terms. In the strategic aspect, a revision of institutional forms of management and administration is necessary, allowing to overcome or, at least, weaken intercommunity disunity. In university science in the sphere of physical culture and science, it seems necessary to create an «ecological niche» for the sustainable development of the scientific university system, to create conditions for its high-quality reproduction based on the coordination of interests of all communities.

References

1. Anisimov R.I. Budushcheye intelligentsii v sotsianoy strukture obshchestva Postmoderna. Intelligentsiya: mnogoobraziye obrazov i stiley zhizni. Zh.T. Toshchenko [ed.]. Moscow: RGGU publ., 2020. pp. 100-105.
2. Bolshakov V.N., Kryazhimskiy F.V. Problema vospriyatiya obshchestvom osnovnykh ponyatiy ekologicheskoy. Sovremennoye informatsionno-metodologicheskoye obespecheniye nauchnosti. Yekaterinburg: UrO RAN publ., 2003. pp. 361-365.
3. Gorshkov M.K., Komissarov S.N., Karpukhin O.I. Na perelome vekov: sotsiodinamika rossiyskoy kultury. Moscow: FNISTS RAN publ., 2022. 703 p.
4. Gorshkov M.K., Sheregi F.E., Tyurina I.O. Vosproizvodstvo spetsialistov intellektualnogo truda: sotsiologicheskiy analiz. M.: FNISTS RAN publ., 2023. 383 p.
5. Dezhina I.G. Nauchnaya politika v Rossii v 2018-2022 gg.: protivorechivyye signaly. Sotsiologicheskiy zhurnal. 2023. Vol. 29. No. 2. pp. 132-149. DOI: 10.19181/socjour.2023.29.2.10.
6. Zborovskiy G.E., Ambarova P.A. Nauchno-pedagogicheskiye rabotniki v sovremennoy Rossii: teoriya i biografiya sotsialnoy obshchnosti. Yekaterinburg: Gumanitarnyy universitet publ., 2024. 430 p.
7. Lubysheva L.I. Sotsiologicheskiye issledovaniya kak faktor upravleniya sotsialnymi protsessami v sfere fizicheskoy kultury i sporta. Teoriya i praktika fizicheskoy kultury. 2022. No. 11. 103 p.
8. Malkin V.R., Rogaleva L.N., Kim A.M., Valeev R.R., Bredikhina Ya.A. Problematika nauchnykh napravleniy sportivnoy psikhologii v Uralskom federalnom universitete. Teoriya i praktika fizicheskoy kultury. 2018. No. 1. pp. 6-8.
9. Novozhenov Yu.I. Adaptivnost krasoty. Sotsiobiologicheskiy analiz prekrasnogo. Yekaterinburg: BKI publ., 2005. 480 p.
10. Peshkova N.V., Lubysheva L.I. Polisubyektnoye upravleniye v studencheskom sporte. Moscow: NITS TPFKS publ., 2022. 192 p.
11. Sotnikova S.I. Novyy kontur otsenki konkurentosposobnosti nauchno-pedagogicheskikh rabotnikov: nezavisimaya otsenka kvalifikatsii. Universitetskoye upravleniye: praktika i analiz. 2018. Vol. 22. No. 3. pp. 113-124.
12. Tikhonova N.E., Latov Yu.V., Latova N.V. et al. Chelovecheskiy kapital rossiyskikh professionalov: sostoyaniye, dinamika, faktory. N.E. Tikhonova, Yu.V. Latov [ed.]. Moscow: FNISTS RAN publ., 2023. 488 p.
13. Shabrova N.V., Ambarova P.A. Publikatsionnaya aktivnost studentov rossiyskikh vuzov. Obrazovaniye i nauka. 2023. Vol. 25. No. 9. pp. 171-196. DOI: 10.17853/1994-5639-2023-9-171-196.

The evolution of theoretical understanding of physical recreation in the context of history

UDC 796.011

PhD, Associate Professor **N.A. Vakhnin**[1]
PhD, Associate Professor **M.A. Elmurzaev**[1]
PhD, Associate Professor **E.A. Izotov**[1]
PhD, Associate Professor **E.T. Mayboroda**[2]
[1]Saint-Petersburg Mining University of Empress Catherine II, St. Petersburg
[2]The Russian Presidential Academy of National Economy and Public Administration, North-Western Institute of Management, St. Petersburg

Corresponding author: m.a.08@mail.ru

Received by the editorial office on 18.01.2025

Abstract

Objective of the study was to discern the characteristics of the evolution of scientific understanding in the realm of physical recreation.

Methods and structure of the study. The foundation of this research was a compilation of scholarly articles that explored the issues of physical rehabilitation. The total number of sources was 85.

Results and conclusions. The theory of physical recreation is the product of merging knowledge from the fields of pedagogy, sociology, and biology. The foundations for understanding physical recreation emerged in various aspects of social practice and became a natural part of people's daily lives.

Through a historical examination, the authors have determined that the foundations for creating a scientific theory and methodology for physical recreation have now been established. Consequently, the expansion of its conceptual framework, the organization of methodological approaches, and the establishment of principles and theoretical foundations for scientific theory as a form of physical culture and physical education are now crucial.

Keywords: *physical recreation, historical roots, physical and mental development of man.*

Introduction. The theory of physical recreation is the result of the integration of knowledge in the fields of pedagogy, sociology and biology. Essentially being an interdisciplinary science, it solves the problems of forming the health and culture of sports leisure of the population [2].

The prerequisites for the emergence of knowledge about physical recreation appeared in different branches of social practice and were included in the natural process of people's lifestyle.

The study of the process of formation of physical recreation as a scientific discipline will allow systematization of knowledge and experience of healthy life of people and sports leisure.

Objective of the study was to discern the characteristics of the evolution of scientific understanding in the realm of physical recreation.

Methods and structure of the study. The foundation of this research was a compilation of scholarly articles that explored the issues of physical rehabilitation. The total number of sources was 85.

Results of the study and discussion. The concept of physical recreation, the main function of which is to restore human health, has been established for a long time and has deep historical roots.

The prerequisites for knowledge about physical recreation in Russia began to take shape in the second half of the 18th century. During the reign of Anna Ioannovna, special noble schools were created – cadet corps, which prepared nobles for military and secular service. In the land cadet corps, along with educational training, cadets were engaged in horse riding, fencing, dancing and music. In the cadet corps, physical education classes were combined with visits to cultural institutions – a library, a cadet museum, participation in theatrical performances, etc. Entertainment, fun games, fist fights were an integral part of all holidays. The closest associate of Peter 1, Feofan Prokopovich, in his pedagogical statements pointed out the need to include walking, body movements, water games in the daily life of people, since they are important means of

hygienic measures, health promotion, organization of life and free time of seminary students. In 1764, the first Russian academician-anatomist A.P. Protasov made a report at a ceremonial meeting of the Academy of Sciences, «On the Necessity of Movement for Health». The greatest representative of Russian pedagogical thought in the second half of the 18th century, A.N. Radishchev (1749-1802), pointed out the close connection between the physical and mental development of a young person. At the beginning of the 19th century, the great Russian surgeon T.I. Pirogov (1810-1881) initiated the introduction of daily morning health exercises in the Odessa educational district under his wardship. Many figures in Russian pedagogical thought attached importance to conducting outdoor games among children, on open areas, considering them an important means of physical and emotional influence on the human body and psyche (D.I. Pisarev, K.D. Ushinsky, L.N. Tolstoy, etc.). In their works, they repeatedly emphasized that physical education should not be limited to the school, because school classes do not take into account the individual characteristics of students, their needs and interests in various forms of motor activity. Thus, physical recreation arose in the depths of pedagogical science and was considered a type of physical education. The main and consistently developed idea was that physical education should be considered as one of the most important aspects of a person's holistic education – «education through the physical». Sports and playgrounds appeared in educational institutions, and gymnastics classes began to be created in schools. Developing the ideas of I.M. Sechenov on the compensatory and restorative function of physical exercises, he substantiated the most important pedagogical requirement: the need to change and alternate mental activities with physical exercises and outdoor games. P.F. Lesgaft included physical exercises in the basis of the physical education system he proposed for school-age children that met the anthropological, anatomical, psychological characteristics of those involved, their state of health. He emphasized the need to take into account the national characteristics of children, i.e. the personality-oriented approach was the main thing in the system he proposed. His provisions on the need to emphasize the health-improving nature of the physical exercises used in children's physical education, their accessibility, arbitrariness, the need to take into account the individual characteristics of those involved, their state of health were important features of the emerging social phenomenon - physical recreation [1]. In 20th century Russia, the idea of the comprehensive development of a person, strengthening health, organizing recreation through the use of physical activity was reflected in the leisure of the population. The Department of Health Protection created under the People's Commissariat of Health (1918) recommended making wide use of the possibilities of the natural environment: parks, squares, gardens, believing that these conditions have a beneficial effect on the physical and mental health of those involved. The main focus and content of physical activity was health-improving.

It is no coincidence that the People's Commissariat of Health and the People's Commissariat of Education supervised the physical education of people, and the very fact of the appointment of the People's Commissar of Health N.A. Semashko as Chairman of the Supreme Council for Physical Culture emphasizes the special attention of the state to the health of the population. This was facilitated by the rapid development of natural science disciplines - anatomy, physiology, hygiene, etc., a direction in the theory of physical culture appeared - health-improving physical culture, but it had not yet acquired the status of a scientific discipline. Medical control over the physical health of those involved was strengthened. A significant contribution to the development of knowledge about physical recreation was the adoption of a number of important state documents of physical culture and sports – regulatory framework for physical culture, GTO complexes (1931) and physical training complexes for students of educational institutions BGTO (1934). The undoubted advantage of the introduced complexes was the fact that their main goal was to attract broad masses of the Russian population to active motor activity – from early childhood to old age. The envisaged standard indicators of the complexes were oriented towards the age and gender characteristics of those involved, their state of physical health.

Holding physical culture parades on national holidays, mass demonstration performances of physical culture athletes demonstrating physical health have become an integral part of the life of Russian society.

Summarizing the advanced pedagogical experience of some of the most prominent domestic educators and public figures of the late 19th - early 20th centuries, we can say that they made an important conclusion about the importance of physical education in the development of social relations, strengthening the health of the nation, a particular person.

Physical education allows us to successfully solve specific problems: upbringing and education of the younger generation, organizing the free time of the population, preventing crime among young people, preparing them for professional work, service in the armed forces.

The provisions put forward by progressive educators on the important role of physical education and sports in the education of children and adolescents, unfortunately, did not find their logical advancement in the pre-war years. In the post-war years, the domestic system of physical education of people was restored fairly quickly. In 1949, the monograph by A.D. Novikova, in which the author particularly emphasized the idea of the unity of the physical and mental. Another limitation of existing definitions of physical culture is that its main purpose of functioning and results are traditionally considered as a means of preparation for labor combat activities with maximum benefit for the state (A.D. Novikov, L.P. Matveev, 1959). The entire process of evolution of knowledge about physical recreation in the domestic system of physical education shows that the main source of knowledge was its focus on the physical preparation of the population for work and defense of the Motherland. A qualitatively new stage in the development of knowledge about physical recreation in the 21st century is its consideration not only as a means of philosophical and religious education or the formation of physical strength, health, but also a means of comprehensive human development [3]. Enrichment with social experience, universal values of psychosocial and mental health occurs not only due to the influence of social institutions, but also self-influence, independent use of motor activity for these purposes.

Conclusions. Based on historical experience, the prerequisites for building a scientific theory and methodology of physical recreation have now been formed. In this regard, the expansion of its conceptual apparatus, the systematization of methodological approaches, the formation of principles and conceptual foundations of scientific theory as a type of physical culture and physical education are being updated.

References

1. Ryzhkin Yu.E. Prichiny vozniknoveniya i pervonachalnoye razvitiye znaniy o fizicheskoy rekreatsii. St. Petersburg. RGPU im. A.I. Gertsena, publ. 1996.
2. Elmurzaev M.A., Zaitsev A.V., Murasheva M.V. Genezis zarubezhnykh issledovaniy dosuga i fizicheskoy rekreatsii. Teoriya i praktika fizicheskoy kultury. 2021. No. 3. pp. 102-104.
3. Elmurzaev M.A., Panchenko I.A. et al. Postroyeniye modeley fizicheskoy rekreatsii: innovatsionnyy vektor razvitiya. Teoriya i praktika fizicheskoy kultury. 2019. No. 3. pp. 47-48.

The establishment of a healthy lifestyle culture among students requires a combination of organizational and educational factors

UDC 796.011.3

PhD, Associate Professor **V.V. Bobkov**[1, 2, 3]
PhD **B.A. Sviridov**[1, 4]
PhD, Associate Professor **N.N. Uvarova**[1]
PhD **T.G. Guruleva**[5]
[1]Plekhanov Russian University of Economics, Moscow
[2]Federal Science Center of Physical Culture and Sport (VNIIFK), Moscow
[3]National University of Oil and Gas «Gubkin University», Moscow
[4]National Research University «Moscow Power Engineering Institute», Moscow
[5]Moscow State University of Civil Engineering (National Research University), Moscow

Corresponding author: vitaly-x5@yandex.ru

Received by the editorial office on 27.04.2025

Abstract

Objective of the study was to determine the organizational and educational factors that contribute to the development of a healthy lifestyle among young people, guided by their values.

Methods and structure of the study. The research involved students from the first to fourth years of study at the Plekhanov Russian University of Economics, with a total of 441 participants, including both male and female students. The age range of the participants was between 17 and 25 years. In the initial phase, the participants were administered a survey using the M. Rokich «Value Orientations» method, which consisted of 18 questions. In the subsequent phase, the survey was conducted using an original questionnaire that focused on the participants' behavior at school and at home, their current knowledge of human physiology, their understanding of healthy lifestyle principles, and their level of physical activity.

Results and conclusions. The process of cultivating a healthy lifestyle culture requires a multifaceted approach. It should encompass interdisciplinary initiatives, imaginative tasks, and the integration of health-related themes into the social sciences and humanities. Additionally, it involves the dissemination of educational content through internal and external platforms, enhancing the curriculum with more engaging physical education classes, and addressing the needs of students by providing incentives for a healthy lifestyle.

Furthermore, it is essential to conduct preventive medical examinations to raise awareness about one's health status.

Keywords: *students, healthy lifestyle culture, value orientations, terminal and instrumental values, health, physical education, M. Rokeach's methodology.*

Introduction. The coronavirus pandemic has brought to the forefront the issue of maintaining the health of the nation [1]. This logically implies the need to cultivate in the modern generation a value-based attitude towards their own health, because the health of the nation is made up of the health of each individual person, especially young people – people of reproductive age, who are primarily tasked with preserving the population [2, 3, 4]. The formation of value orientations by almost 80% occurs at the stage of the «youth» period of life, and such social institutions as family, education, religion, social circle of communication, and the media influence their consolidation. Today, students' value-based attitude towards a healthy lifestyle is formed mainly due to a wide variety of information on the Internet, which mainly comes down to the promotion of a visually beautiful face and body, a glossy lifestyle, while systematicity and awareness are important for a healthy lifestyle [5, 6, 7].

Objective of the study was to determine the organizational and educational factors that contribute to the development of a healthy lifestyle among young people, guided by their values.

Methods and structure of the study. The research involved students from the first to fourth years of study at the Plekhanov Russian University of Economics, with a total of 441 participants, including both male and female students. The age range

of the participants was between 17 and 25 years. In the initial phase, the participants were administered a survey using the M. Rokich «Value Orientations» method, which consisted of 18 questions. In the subsequent phase, the survey was conducted using an original questionnaire that focused on the participants' behavior at school and at home, their current knowledge of human physiology, their understanding of healthy lifestyle principles, and their level of physical activity.

Results of the study and discussion. The overwhelming majority of students put the category «health» in first place as the highest value for themselves, which will determine the organizational and pedagogical conditions for the formation of a healthy lifestyle in the university. Among the components of a healthy lifestyle, students most often name physical activity and a balanced diet, forgetting to indicate no less important components such as personal hygiene, hardening the body and giving up bad habits. They put «love» in second place, «materially secure life» in third place, and «interesting work» took a modest 5th place. Students express their readiness for active work, improvement, personal development. This assumption is confirmed by the 6th place of the category «development», 8th place of «active productive life» and «productive life» – 12th place, out of 18 terminal values of M. Rokich (Table 1). Of the total number, 55,6% of students are characterized as «Security-seeking, collectivists, pragmatists», they have a strong need for various aspects of security, are pragmatic and are oriented towards life in a specific social group. «Health» indicates physical security, «a financially secure life» indicates economic security, «a happy family life» and «having good and loyal friends» indicate psychological and social security.

The study showed that students who regularly engage in physical education and sport actively participate in group projects and events. A direct positive relationship was found between the frequency of classes and the comfort of expressing their thoughts and feelings to others; the vast majority of students who engage in physical activity for more than two hours a week are able to effectively resolve conflicts and disagreements with others; at the same time, gender does not affect the ease of communication with new people and their active participation in group projects and events. It is noteworthy that among students aged 17-18, the frequency of physical education and sport classes is significantly higher than among those aged 21 and older. This fact emphasizes the general trend of decreasing physical activity from year to year. In addition, as it turned out, most girls engage in physical education more often than boys. The value of "public recognition" is typical for first-year students, for them it is necessary to expand sports tournaments, competitions, relay races, health festivals, virtual challenges to perform various physical activities through applications or social networks, health marathons, contests for knowledge of a healthy lifestyle, etc. with mandatory awarding and honoring of the winners, as well as high assessment of other participants.

In social networks, 40,9% of respondents are subscribed to the «sport» category. 64% of students noted that the main source of information about a healthy lifestyle and physical culture is the Internet, which is an alarming signal, for the reason that along with correct and useful information, there is a large amount of useless, and sometimes harmful content (Table 2).

Table 1 – Analysis of the leading terminal values of students of the Plekhanov Russian University of Economics in 2024

Terminal values	Rank (place)	Average X±σ	Standard Error of the Mean	Standard deviation
Health	1	4,71	0,233	4,9
Love	2	6,27	0,223	4,69
A financially secure life	3	6,79	0,205	4,31
Having good and loyal friends	4	7,46	0,183	3,84
Interesting work	5	8,3	0,207	4,34
Development	6	8,96	0,193	4,04
Happy family life	7	8,98	0,261	5,49
Active and active life	8	9,05	0,248	5,21
Freedom	9	9,1	0,230	4,84
Life wisdom	10	9,13	0,248	5,21

Table 2 – Analysis of behavioral characteristics, attitudes towards a healthy lifestyle and the level of knowledge about physical education of an individual

Questions	Most popular answers as a percentage of total N
How many hours a week on average do you do physical exercise?	59% - more than 2 hours a week
What items will you be sent? You can choose from 1 to 4.	45% - physical education
Identify the main sources of information about a healthy lifestyle and physical education	64% - Internet (fitness blogs, media personalities, etc.)
Describe the healthy lifestyle culture; what combination of concepts comes to mind?	34,2% - balance of movement and food consumed, attentive attitude to one's own health
Who do you listen to more, whose opinion do you respect more?	79% - relatives and close friends
While studying at university, do you feel that your health is taken care of?	72% - yes, we feel care about our health
How much can a university's sports environment influence a healthy lifestyle and physical activity?	56% - availability of gyms and variety of training programs are an incentive for additional training
What physical fitness indicators do you know about yourself?	83% - Body weight / height 70% - Number of steps per day 54% - Resting heart rate
What physical activity, sports, including home workouts, are present in your life?	32% - cardio (running, walking, cycling) 35% - fitness/gym, group programs – 35% 20% - Game types
What factors, conditions, ideas, and events in the university and the country could improve the healthy lifestyle culture of students?	85% - more halls, sports and ease of «entry» into the university's sports space

Taking into account the survey results, the organizational and pedagogical conditions for the formation of a healthy lifestyle culture were developed: 1. Organization of events to form a healthy lifestyle in the university, combining creative, physical, intellectual, game and project activities of a creative nature, democratic in the choice of actions and the degree of involvement (an integrated approach). The events should have emotional and physical mobility. Such new interdisciplinary projects can be implemented at the following levels: intra-university events, projects between faculties (higher schools), courses, individual student groups, and positioned as «Health Day», «Health Week», «Survival School», a sports quest, a creative project. The advantages of the events will be – «Competitions for everyone», active recreation, master classes in health gymnastics and sports; «informal sports» (communities of interested persons for sports and active recreation, without organization from the university). The relevance and significance of such projects is emphasized by the high interest of students in creative activities (64,8%), organizational activities (24,8%), and sports (37,9%).

2. Interdisciplinary integration in stimulating a healthy lifestyle. Modernized knowledge enriched with research material can be introduced into disciplines such as life safety fundamentals, physical education, cultural studies, philosophy, psychology, pedagogy, and economics. This requires intra- and inter-industry operational communication on an educational platform that presents the best health practices, healthy lifestyle recommendations, digital services, and an online healthy lifestyle course.

3. Taking into account the needs of students in stimulating a healthy lifestyle. Students highlighted the following proposals: 1) improving sports infrastructure; 2) free sports sections; 3) physical activity in various projects, their greater financial support; 4) the presence of sports clubs for amateurs; 5) more competitions among higher schools; 6) creative videos about healthy eating; 7) more interesting physical education and sports classes; 8) health trips; 9) organizing lectures, seminars, and workshops on healthy lifestyles (informational approach).

4. Providing timely psychological assistance, dealing with stress and anxiety (interdisciplinary approach). The stress level of the younger generation is quite high, and not all students can cope with it on their own. The university administration needs to open psychological offices, think through and include psychological relief activities in their plans, give young people the opportunity to talk openly

about psychological problems and seek help at the university.

5. Conducting preventive medical examinations aimed at increasing the level of knowledge about health.

6. A specially developed menu at the university; video contests and nutrition lessons. The culture of nutrition and the culture of consumption should be cultivated, on the one hand, by the food service, the health center and the health resort, and, on the other hand, by the entire teaching staff. The study found that 28.1% of respondents study pages on social networks about rational nutrition and are interested in creative videos.

7. Creating partnerships between universities and health authorities to integrate healthy lifestyle programs (comprehensive and interdisciplinary approach).

Conclusions. The key organizational and pedagogical conditions for the formation of a healthy lifestyle culture. The process should include interdisciplinary projects, creative tasks; expansion of healthy lifestyle topics in the disciplines of the social and humanitarian block; placement of creative educational content on internal and external platforms; more interesting educational classes in physical education and sports; taking into account the needs of students in stimulating a healthy lifestyle. Conducting preventive medical examinations aimed at increasing the level of knowledge about health.

The scientific research was carried out within the framework of an internal research grant from the funds of the Federal State Budgetary Educational Institution of Higher Education "Plekhanov Russian University of Economics"

References

1. Barabanov N.A., Levchenkova T.V., Germanov G.N. Opredeleniye shiroty poznavatelnogo interesa studentov vuzov fizicheskoy kultury. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2023. No. 1(215). pp. 40-43.
2. Bobkov V.V., Ryzhkova L.G., Lazarev I.V. et al. Analiz anketirovaniya studentov-pervokursnikov tekhnicheskogo vuza po voprosam otnosheniya k fizicheskoy kulture i sportu. Teoriya i praktika fizicheskoy kultury. 2024. No. 5. pp. 69-71.
3. Zhupnik O.N. Trendy tsennostnykh oriyentatsiy studencheskoy molodezhi. PhD diss. abstract. Simferopol, 2018. 20 p.
4. Kakhnovich S.V., Izvekov V.V., Izvekov K.V. Fizicheskaya kultura v tselostnom protsesse formirovaniya lichnosti. Teoriya i praktika fizicheskoy kultury. 2019. No. 2. pp. 52-53.
5. Lubysheva L.I. Fizicheskaya podgotovlennost sportivnogo studenchestva kak faktor formirovaniya professionalnykh kompetentsiy. Teoriya i praktika fizicheskoy kultury. 2022. No. 3. 103 p.
6. Lubysheva L.I. Onlayn-obrazovaniye: sostoyaniye i perspektivy. Teoriya i praktika fizicheskoy kultury. 2022. No. 4. 107 p.
7. Lubysheva L.I. Optimizatsiya samostoyatelnoy raboty studentov v sisteme fizicheskogo vospitaniya na osnove elektronnykh obrazovatelnykh resursov. Teoriya i praktika fizicheskoy kultury. 2022. No. 6. 105 p.

The new aspects of digitalization in the professional activity of teachers of secondary educational institutions of sports orientation

Postgraduate student **K.M. Shkatova**
PhD Philosophical Sciences, associate professor **Balaeva O.E.**
The Russian University of Sport «GTSOLIFK», Moscow

UDC 796

Received by the editorial office on 27.04.2025

Keywords: *professionalization, digitalization, electronic educational resources, distance learning format, special educational institution of sports and pedagogical orientation*

Introduction. In modern conditions, the process of digitalization begins to play an important role in the organization of a teacher's professional activity, i.e. the translation of various types of textual, visual, and information into digitized form. Therefore, the digitalization of education involves filling and improving the digital educational environment, taking into account the requirements of modern realities.

The purpose of the study is to determine the role of the digitalization process in the work of a teacher of a professional secondary educational institution in distance and mixed formats.

Methodology and organization of research. The object of this study was the teachers of the SPE MSUOR No. 1 and MSUOR No. 3. The methodology of a specific sociological study was used to analyze the problem. This allowed us to obtain more detailed information on the problem under study. First of all, the survey method was used, which was used to obtain primary sociological information.

The results of the study and their discussion. Approximately half of the teachers from MSDS No. 1 and MSDS No. 3 conduct their lectures using presentations, and only 1/10 of them use electronic resources in their work, that is, they accompany their lecture with visual materials using electronic resources such as audio, video and photo files.

It was also important to study which electronic resources teachers use to implement the learning process. We found out that all teachers are actively working with the «MASH» resource, which allows them to give grades, set homework, and conduct thematic planning of the educational process. It is mandatory for use in public educational institutions: schools and colleges, however, there is no possibility of communication between students and teachers in this resource. Teachers also use LMS electronic educational resources in their work.

Tests and exam papers with the transition to a distance learning format have also begun to be conducted using new electronic resources.

Previously, about 50% of teachers preferred the ticket form of control, but in the last two academic years, the options of "setting up a vending machine, according to accumulated assessment" prevail. More than 40% of the teachers answered this way. The answers are also popular: "online conversation exam" and online knowledge control tests.

Conclusions. Summarizing the information obtained in the course of this study, the authors have created a table that clearly demonstrates the changes in the main aspects of the work of the educational institutions of the ISDR No. 1 and ISDR No. 3 in the context of the intensification of the digitalization process caused by the transition to a distance learning format.

References

1. Ilyina N.F. Professional development of a teacher in an innovative complex: Abstract. Dissertation of the Candidate of Pedagogical Sciences: 13.00.08 Krasnoyarsk, 2006, 198 p.
2. New learning format [Electronic resource] Access mode: http://edu-forum.pro / Date of request: 03/17/2022
3. Fundamentals of e-learning in schools and universities[Electronic resource] Access mode: https://www.gd.ru/articles/elektronnoe-obuche

Corresponding author: trisha03@yandex.ru