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Theory & Practice of Physical Culture

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

Digital Sportization Technology: A Hybrid Format

The idea of sportization in physical education for students is to optimally utilize the potential of sport to enhance the effectiveness of physical education, motivate students to engage in physical activity, and promote a healthy lifestyle. One important aspect of the sportization concept is to develop a conscious interest in sport-based activities among the younger generation and young people, based on their freedom of choice. The key principle of sportization is the conversion of sports technologies into physical education, according to which training sessions are focused on developing not only physical qualities but also the specific skills required for a particular sport. This approach allows for greater achievement in physical fitness and improved functional fitness.

Furthermore, within the sportization approach, students can try their hand at various sports, identify their strengths, and develop athletic skills under the guidance of qualified coaches. This can be the first step in developing a professional sports career.

In the process of scientifically substantiating sport-based physical education, options and formats for organizing educational physical education and sports activities based on advanced sports technologies have been developed. The innovation and conceptual foundation of sport-based physical education lies in designing conditions for differentiated acquisition of the values of sports culture by students, based on the personal motives, characteristics, and aspirations of each participant.

Overall, the sport-based approach to physical education aims to create conditions for harmonious personal development, improved health, and increased physical fitness in students, while harnessing the powerful motivational potential of sport.

Today, digital technologies can expand the potential of sport-based forms of education, enabling individualized training based on the results of monitoring the participant's physical condition.

The organizational and methodological component forms the basis for organizing, planning, and recording training and competitive activities. Digital tools can be used for its implementation, depending on the organizational objective. For example, to plan training, some sports clubs use the authorized "Electronic Coach's Journal" information system, which allows for the creation of training plans, recording attendance, standard results, and maintaining records of all athletic training in one place.

The assessment and performance component is designed to track the dynamics of individual athletic performance and assess athletic qualities (perseverance, willpower, and teamwork). The use of digital tools allows for the transition from fragmented assessment to objective, multi-factor monitoring of physical fitness, psychological performance, and other indicators.

The systematic implementation of digital technologies in sport-based physical education leads not only to a change in teaching methods, but also to a qualitative transformation of the entire pedagogical system. This integration serves as a relevant trigger that deepens and enhances the effective implementation of key principles of sportization in response to the demands of modern education.

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

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Theory and Practice of Physical Culture

Contents

100th anniversary of the scientific and theoretical journal «Teoriya i praktika fizicheskoy kultury»: present and future

UDC 796

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Abstract

Objective of the study is to systematise and identify scientific, practical, managerial, personnel, social and other aspects of the influence of the TiPFK journal on the formation and development of the physical culture and sports industry in the country and to design new guidelines, approaches and directions for the further development of the basic publication.

Methods and structure of the study. A review and theoretical study was conducted throughout 2024. An analysis of the scientific and theoretical journal TiPFK was carried out for the last 20 years. The content and topics of scientific articles published by scientists and specialists in TiPFK were analysed. The main strategic directions of the journal's activities and its influence on the formation and development of the physical culture and sports movement in the country were determined. Factual material was systematised, the activities of the journal as a whole were modelled, etc.

Results and conclusions. Following the completion of a scientific and theoretical analysis of the formation and development of the TiPFK journal, a structural model was developed for the further progressive development of the country's leading print sports publication. The model includes a strategy and directions for improving the magazine's content in the coming decades, thereby supporting and expanding the scientific and methodological potential, traditions and practices of the physical culture, sports and health movement in Russia.

Keywords: *centenary anniversary, scientific and theoretical journal, Teoriya i praktika fizicheskoy kultury, development and establishment, scientific potential, strategy*

Introduction. In 2025, the scientific and theoretical journal 'Teoriya i praktika fizicheskoy kultury' celebrated its 100th anniversary. The leading journal in the field of physical culture and sport has gone through all stages of progressive development and establishment, starting with the simplest methodological developments and practices, then moving on to scientific and applied areas of development in physical culture and sport; the development of theoretical and methodological foundations for physical education and sports training; the biomechanics of sports movements, modern sports training technologies; the sociological foundations of the physical culture and sports movement in the country; integration of modern electronic resources with basic theoretical and methodological approaches to physical culture and sports, adaptive areas of the sports movement in the country; expansion of the human, scientific and material and technical potential of the physical culture and sports industry in the country.

All this once again highlights the importance and significance of the country's basic print media, the journal 'Teoriya i praktika fizicheskoy kultury', and determines the further strategic directions for the development of sports, mass sports and health policies in society.

Objective of the study is to systematise and identify scientific, practical, managerial, personnel, social and other aspects of the influence of the TiPFK journal on the formation and development of the physical culture and sports industry in the country and to design new guidelines, approaches and directions for the further development of the basic publication.

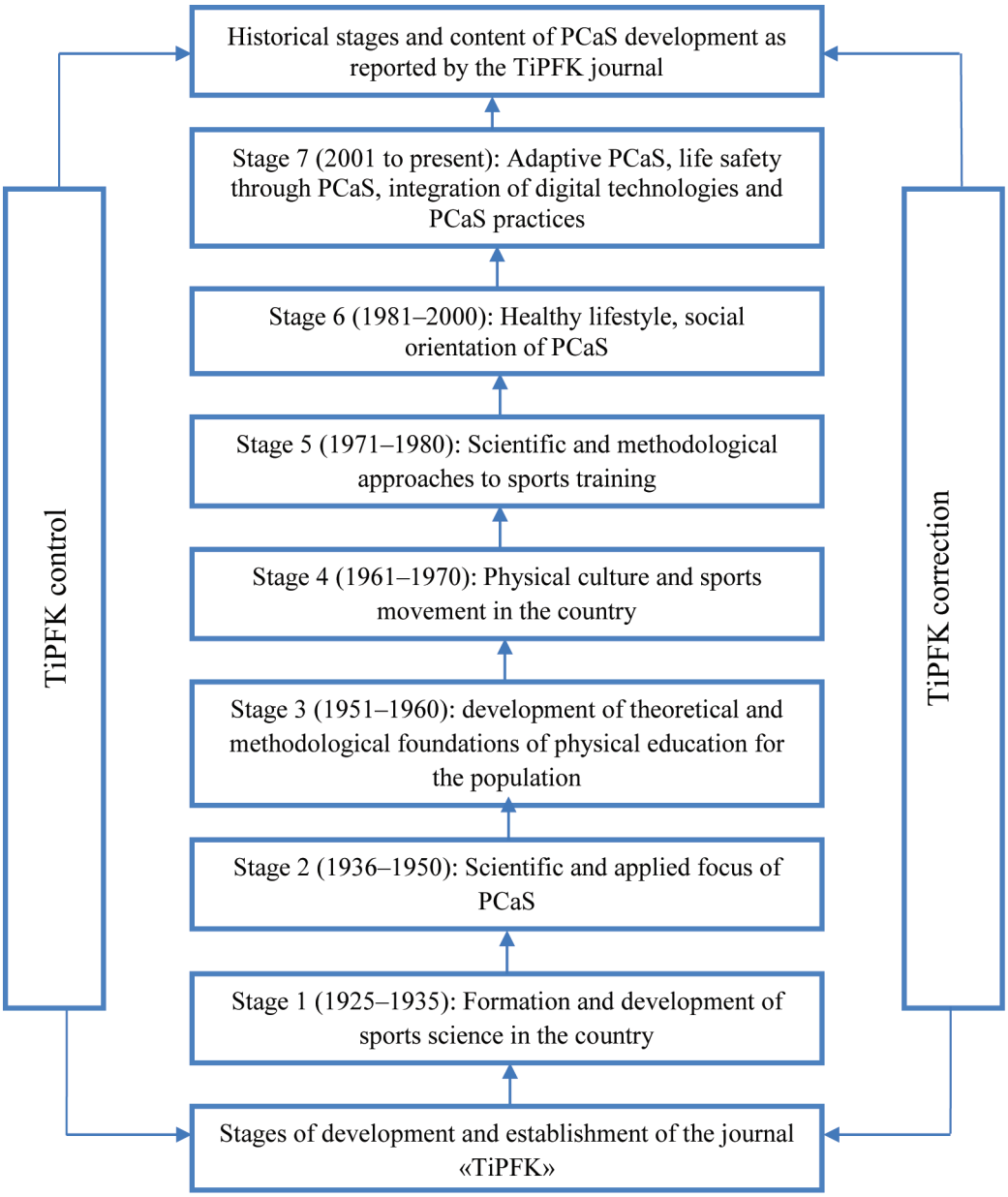

Figure 1 – Stages of development and establishment of a scientific and theoretical journal 'Teoriya i praktika fizicheskoy kultury'

Methods and structure of the study. A review and theoretical study was conducted throughout 2024. An analysis of the scientific and theoretical journal 'Teoriya i praktika fizicheskoy kultury' was carried out for the last 20 years. The content and topics of scientific articles published by scientists and specialists in TiPFK were analysed. The main strategic directions of the journal's activities and its influence on the formation and development of the physical culture and sports (PCaS) movement in the country were determined. Factual material was systematised, the activities of the journal as a whole were modelled, etc.

Results of the study and discussion. The scientific and theoretical analysis of the development and establishment of the journal 'Teoriya i praktika fizicheskoy kultury' contributed to the formation of the main historical stages of the progressive development of the country's basic print publication (Fig. 1).

The basic areas of focus for the journal 'Teoriya i praktika fizicheskoy kultury' have also been established: PCaS management; peer review, scientific 'filter'; material and technical support for the PCaS sector; PCaS organisation; systematisation of scientific knowledge and modern practices; PCaS development strategy; mass appeal; social orientation of the industry; applied orientation; formation of the scientific,

methodological, technological and practical potential of the PCaS industry in the country.

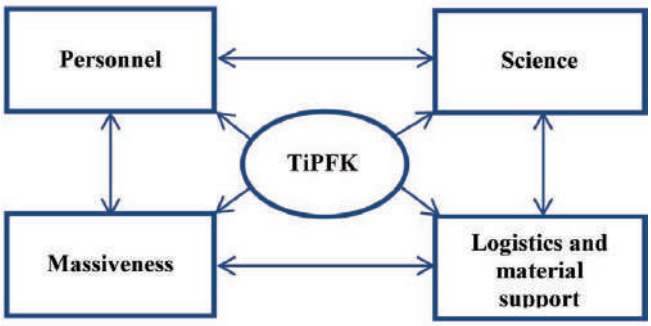

Figure 2 – Basic directions for the development of PCaS using the scientific and theoretical journal 'Teoriya i praktika fizicheskoy kultury'

Thus, the following basic directions are outlined for the modern strategy of further functioning of the journal 'Teoriya i praktika fizicheskoy kultury':

- adaptive physical education and sport;
- correct integration of PCaS practices and modern electronic resources;
- increasing the popularity of physical culture and sports among the population of the country;
- searching for and developing new concepts, technologies, approaches and forms of sports training;
- forming a national sports culture;
- developing national physical education and sports competition practices, taking into account the inability of the country's athletes to travel abroad;
- updating professional and applied physical and military training for the population;
- shaping the safety of life and behaviour of the country's population.

All of the above determines the significance and importance of the scientific and theoretical journal 'Teoriya i praktika fizicheskoy kultury' for the further sustainable development of the PCaS industry and the formation of a sporting power.

Conclusions. A scientific and theoretical review study conducted in connection with the centenary of the journal 'Teoriya i praktika fizicheskoy kultury' made it possible to identify significant stages in the development of this scientific and theoretical publication, determine the basic directions of the journal's functioning, and outline a strategy for the further progressive development of the industry. 'Physical Culture and Sport' with the leading role of the country's basic printed sports publication.

References

1. Lubysheva L.I., Minnikaeva N.V. Frontiry pedagogicheskoy nauki oblasti «Fizicheskoe vospitanie studentov» v fokuse publikatsiy zhurnala «Teoriya i praktika fizicheskoy kultury». Teoriya i praktika fizicheskoy kultury. 2025. No. 2. Pp. 3-8.
2. Lubysheva L.I. V poiskakh kriteriev povysheniya reytinga nauchnogo zhurnala. Teoriya i praktika fizicheskoy kultury. 2023. No. 5. Pp. 105-106.
3. Lubysheva L.I., Guba V.P., Pustoshilo P.V. Kriterii publikatsionnogo reytinga nauchnykh sportivnykh zhurnalov pedagogicheskoy otrasli, retsenziruemykh VAK RF. Teoriya i praktika fizicheskoy kultury. 2023. No. 5. Pp. 106-109.

Monitoring the readiness of sports teams in competitive sports among students

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Abstract

Objective of the study is to justify the content of integrative control of the preparedness of student teams in various game sports.

Methods and structure of the study. During the 2024-2025 academic year, individual tactical actions and psychophysiological indicators of student teams from Smolensk State University of Sports and Don State Technical University were tested in basketball and volleyball, and indicators of compliance with control standards were determined as a result of integrative control of athletes' preparedness.

Results and conclusions. The use of integrated monitoring of individual tactical actions and psychophysiological indicators of basketball and volleyball players allows for the collection, analysis, and interpretation of information, which forms the basis for effective management of training and competitive activities.

Keywords: *sports, students, student teams, preparedness, development.*

Introduction. The development, formation, and stabilisation of any system is determined by integrative control and the application of management decisions that ensure the analysis and synthesis of the effectiveness of pedagogical influences in the training of student teams in basketball and volleyball, which, according to experts, determines the improvement of players' athletic form [1, 3].

Integrative control of preparedness provides information covering various aspects of a player's condition, which allows for the assessment of the strengths and weaknesses of individual tactical and psychophysiological training. The data from integrative control allows the coach to determine and adjust the content of individual tactical and psychophysiological training, introduce non-traditional training methods, and regulate the volume and intensity of loads at different periods of the annual training cycle for athletes [2].

The effectiveness of the rationale for integrative control of the individual tactical and psychophysiological preparedness of student team players in basketball and volleyball can only be verified if all its structural elements are experimentally tested at all stages of the annual training cycle. This will make it possible to establish the effectiveness of individual tactical and psychophysiological training of student team athletes in game sports.

Objective of the study is to justify the content of integrative control of the preparedness of student teams in various game sports.

Methods and structure of the study. The research was conducted during the 2024-2025 season of the Smolensk State University of Sport (Smolensk) and Don State Technical University (Rostov-on-Don) student basketball and volleyball teams participating in All-Russian competitions. The main research method was a formative pedagogical experiment, which included testing the implementation of integrative control of the preparedness of players on the student teams of the experimental group (EG, n=36 athletes), which made it possible to relatively quickly

make changes to the content of the individual tactical and psychological training of athletes, taking into account the information received about the condition of the athletes. In the control group (CG, n=36 athletes), the integrative control system was not implemented. The final results of volleyball matches and the efficiency coefficient of basketball players in student teams served as integrative control indicators.

Results of the study and discussion. The key methodological techniques that determine the system of integrative control of the preparedness of student team athletes in basketball and volleyball are:

• analysis of the dynamics of individual tactical and psychophysiological preparedness indicators;

• development of a gradation of preparedness level assessments;

• development of preparedness standards.

Actual data on the level of individual tactical and psychophysiological preparedness during the preparatory, competitive and transitional periods of the annual training cycle of student team players in basketball and volleyball made it possible to adjust the training plan, which was based on varying specialised training methods and physical exertion.

The effectiveness of the proposed integrative control for managing the individual tactical and psychophysiological training of student volleyball team players was determined using pedagogical observations. It was found that during the formative pedagogical experiment, the EG players won a significant number of matches with scores of 3:0 and 3:2, and there was a decrease in the number of matches lost with a score of 0:3 compared to the results shown at the beginning of the study (Fig. 1). The data obtained allow us

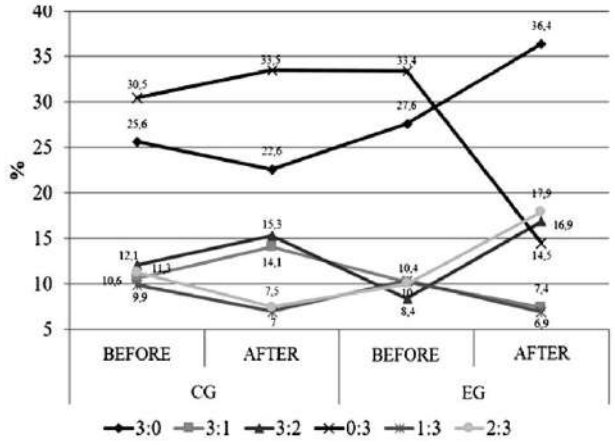

Figure 1. Dynamics of the final result in a volleyball match between student teams from CG and EG during a formative pedagogical experiment

to conclude that as a result of adjusting the content of individual tactical and psychophysiological training by varying the magnitude and direction of training loads, athletes are able to demonstrate high variability, effectiveness and efficiency in performing game techniques in various tactical situations of confrontation with an opponent, as well as when interacting with a teammate and the game object (ball).

Analysis of the data in Fig. 2 showed that before the start of the formative pedagogical experiment, the coefficient of useful play among basketball players in the CG and EG student teams was at a fairly low level and did not differ significantly between the groups under consideration ($p>0.05$). As a result of the introduction of a system of integrated control of individual tactical and psychophysiological preparedness, which allows for effective variation in the magnitude and direction of training and competitive loads for basketball players on the EG student teams during competitive activities by comparing the results obtained with the normative requirements, there is a positive trend in the coefficient of useful play (Fig. 2).

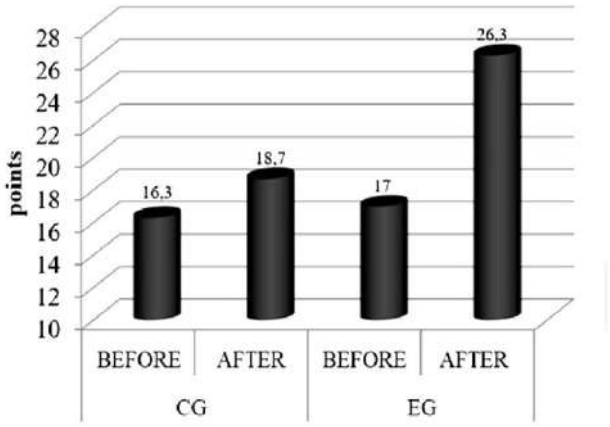

Figure 2. Dynamics of the performance coefficient (PC) indicators for basketball players on the CG and EG student teams during the formative pedagogical experiment

The research showed that during the formative pedagogical experiment, the effective play coefficient of the student basketball teams in the EG increased by 9.3±0.5 points ($p<0.05$), while that of the athletes in the CG increased by only 2.5±0.06 points ($p>0.05$). The data obtained are consistent with the research of some specialists [4, 5], who note the high importance of psychophysiological abilities and individual tactical actions for achieving high competitive performance.

Conclusions. It should be emphasised that the studies conducted on the issues of integrative control of the individual tactical and psychophysiological preparedness of basketball and volleyball players in student teams determine the final result in competitions. Adjustments made to the content of the training methods and workload used, taking into account the fulfilment of regulatory requirements, allow players to demonstrate optimal athletic form at a specific period of the annual cycle.

References

1. Gabibov A.B., Ryzhkin N.V., Semykina I.N., Lukyashko A.G. Osobennosti organizatsii sektsionnoy raboty po voleybolu v usloviyah universiteta. Teoriya i praktika fizicheskoy kultury. 2025. No. 10. Pp. 49-51.
2. Guba V.P., Skripko A., Stula A. Testirovanie i kontrol podgotovlennosti futbolistov. Moskva: Sport, 2016. 168 p.
3. Guba V.P., Rodin A.V., Bulykina L.V., Zaynetdinov M.V. Teoriya i metodika obucheniya bazovym vidam sportivnyh igr v sisteme fizicheskogo vospitaniya: uchebnoe posobie. Moskva: Sovetskiy Sport, 2023. 289 p.
4. Rodin A.V. Osobennosti etapnogo kontrolya individualnyh takticheskih deystviy kvalifitsirovannyh sportsmenov v igrovyh vidah sporta. Vestnik sportivnoy nauki. 2014. No. 3. Pp. 9-12.
5. Tihomirov A.K. Tekhnologiya integrativnogo kontrolya na predkulminatsionnom etape sportivnoy podgotovki v slozhnokoordinatsionnyh vidah sporta: avtoref. dis. ... dokt. ped. nauk: 13.00.04. Malakhovka, 2006. 44 p.

Shifting the athlete's centre of gravity when performing a roundhouse kick (Mawashi-geri)

UDC 796.853.26

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Abstract

Objective of the study is to analyse changes in the coordinates of the athlete's overall centre of gravity during the demonstration of a Mawashi-geri roundhouse kick, performed both technically correctly and incorrectly.

Methods and structure of the study. The experiment was conducted at the Petrodvorets District Olympic Reserve Sports School. During the study, video recordings were made of the athlete performing a Mawashi-geri kick with his right and left legs – a) technically correct and b) without turning the foot of the supporting leg. Each kick was performed three times.

Results and conclusions. To describe the movement, the coordinate value ranges (quasi-attractors) of the overall centre of gravity and the centres of gravity of the athlete's body segments are used. In the case of a Mawashi-geri kick performed without turning the supporting leg, the values of the quasi-attractors of the striking leg are smaller compared to a kick performed with the supporting leg turned. The value of the quasi-attractor of the coordinates of the centre of gravity of the striking leg can be used as a criterion for identifying technical errors. The results of the study can be used to correct striking techniques in combat sports.

Keywords: *centre of gravity, technique, kick, Mawashi-geri.*

Introduction. Most experts agree on the need to analyse the biomechanical characteristics of sports techniques during the learning and training process. Failure to do so may lead to distorted perceptions of the correct technique, repeated mistakes during training, and a lack of progress in improving athletic skills [1-3].

Objective of the study is to analyse changes in the coordinates of the athlete's overall centre of gravity during the demonstration of a Mawashi-geri roundhouse kick, performed both technically correctly and incorrectly.

Methods and structure of the study. The experiment was conducted at the Petrodvorets District Olympic Reserve Sports School. During the study, video recordings were made of the athlete performing a Mawashi-geri kick with his right and left legs – a) technically correct and b) without turning the foot of the supporting leg. Each kick was performed three times.

The video recordings were made in the sagittal plane. They were then broken down into frames. The centres of gravity of the body segments were marked on each frame. A fourteen-link model of the human body was used: head, torso, right and left shoulders, forearms, hands, shins, hips, calves, and feet. Next, the coordinates of the athlete's overall centre of mass were calculated. The value ranges (quasi-attractors) of the athlete's centre of gravity coordinates along the Ox and Oy axes were determined [4]. The quasi-attractors and maximum values of the striking foot coordinates were also determined.

All programmes used to process the video recordings were written in Python using DeepSeek artificial intelligence.

Results of the study and discussion. Fig. 1 shows a technically correct execution of the Mawashi-geri kick.

Figure 1. Demonstration of a Mawashi-geri kick by Amelia Brauska, winner of the 2023 Russian Jiu-Jitsu Championship (coaches A.V. Lukyanov, E.V. Kirillova, Petrodvorets District Olympic Reserve Sports School).

Fig. 2 shows a Mawashi-geri kick with a technical error – the lack of rotation of the supporting leg.

Figure 2. Demonstration of a Mawashi-geri kick without turning the foot of the supporting leg

Table 1 shows the maximum and minimum values of the athlete's centre of gravity coordinates during the demonstration of a Mawashi-geri kick, performed correctly and without turning the foot of the supporting leg.

Table 2 shows the maximum and minimum values of the athlete's centre of gravity coordinates during the demonstration of a Mawashi-geri kick without foot rotation.

Tables 1 and 2 show that the quasi-attractors of the coordinates of the athlete's common centre of gravity on both axes have large values in the case of a turn of the supporting leg.

The maximum values along the Ou axis are greater when the foot is not rotated. However, the conclusion that a higher kick can be achieved when the foot is not rotated is incorrect.

Table 1. Maximum and minimum values of coordinates of the total centre of gravity and their quasi-attractors in the sagittal plane with foot rotation

Values	First attempt		Second attempt		Third attempt	
	Ox	Oy	Ox	Oy	Ox	Oy
Min	1038	-625	1013	-611	1010	-624
Max	1237	-467	1203	-516	1177	-531
Delta	199	157	190	95	167	93

Table 2. Maximum and minimum values of the total centre of gravity coordinates and their quasi-attractors in the sagittal plane without foot rotation

Values	First attempt		Second attempt		Third attempt	
	Ox	Oy	Ox	Oy	Ox	Oy
Min	1009	-557	1024	-560	1018	-550
Max	1183	-459	1180	-477	1178	-531
Delta	174	158	156	83	130	69

Table 3. Angles between the torso and the supporting leg during the demonstration of a technically correct Mawashi-geri kick without turning the foot

Attempt	Technically correct kick	No foot rotation
First attempt	131,6	144,3
Second attempt	125,8	141,5
Third attempt	124,8	135,8

Table 4. Maximum and minimum values of the centre of gravity coordinates of the right foot and their quasi-attractors in the sagittal plane during foot rotation

Values	First attempt		Second attempt		Third attempt	
	Ox	Oy	Ox	Oy	Ox	Oy
Min	709	-991	688	-965	691	-994
Max	1430	-142	1417	-221	1404	-210
Delta	721	849	729	744	713	784

Table 5. Maximum and minimum values of the centre of gravity coordinates of the right foot and their quasi-attractors in the sagittal plane during impact without foot rotation

Values	First attempt		Second attempt		Third attempt	
	Ox	Oy	Ox	Oy	Ox	Oy
Min	657	-949	660	-953	673	-913
Max	1370	-318	1380	-274	1344	-307
Delta	713	631	708	679	671	606

Table 3 shows the angles of the torso at the moment of the foot's highest position. The angles were determined using the Kinovea programme.

Figure 3. Angle between the supporting leg and the torso

Thus, we can conclude that the lower centre of gravity during a spinning kick is due to the greater inclination of the torso, rather than the lower height of the kick.

Table 4 shows the maximum and minimum values of the coordinates of the centre of gravity of the right foot during the demonstration of a technically correct Mawashi-geri kick.

Table 5 shows the maximum and minimum values of the centre of gravity coordinates of the athlete's right foot during the demonstration of the Mawashi-geri kick without turning the foot.

Tables 4 and 5 show that the quasi-attractors of the centre of gravity coordinates of the striking foot in the case of a turned foot of the supporting leg are greater both along the Ou axis and along the Ox axis. From this, we can conclude that the projections of the path travelled by the striking foot are greater in the case of a turned foot of the supporting leg, which indicates a greater height and greater striking distance. The absence of foot rotation results in a shorter striking distance and lower height.

Similar data were obtained for the left leg.

Conclusions:

- to describe an athlete's movement, it is advisable to use the coordinate value ranges (quasi-attractors) of the overall centre of gravity and the centres of gravity of the body segments.

- additionally, the angle value ranges between body segments can also be taken into account.

- a turned-out foot of the supporting leg allows for longer range and higher kicks. failure to turn the foot

of the supporting leg leads to a reduction in the range and height of the kick.

- the value of the quasi-attractor of the coordinates of the centre of gravity of the kicking foot can be a criterion for identifying technical errors.

- quasi-attractors of the coordinates of the athlete's total centre of mass can be criteria for describing striking technique, but they do not reflect either the range or the height of the kick.

- the results of the study can be used in the training process to correct striking techniques in combat sports.

References

1. Levitskiy A.G., Krutoy A.N., Matveev D.A., Berekenov A.Zh. Otsenka rotora silovogo polya u sportsmenov-edinobortsev vysokoy kvalifikatsii pri peredvizhenii sposobom «Chelnok». Teoriya i praktika fizicheskoy kultury. 2025. No. 5. Pp. 15-17.
2. Levitskiy A.G., Matveev D.A., Potsipun A.A., Oshina O.V. Divergentsiya silovogo polya v protsesse peredvizheniya sposobom «Chelnok». Teoriya i praktika fizicheskoy kultury. 2025. No. 1. Pp. 106-107.
3. 3. Medvedkov V.D., Umarov M.K., Ashirova O.I. Biomekhanicheskie sekrety peredney podsechki chempiona mira, 3-kratnogo chempiona Evropy. Uchenye zapiski universiteta im. P.F. Lesgafta. 2019. No. 5(171). Pp. 202-206.
4. Eskov V.M., Zinchenko Yu.P., Zhuravleva O.A., Filatova O.E. Tri globalnye paradigmy estestvoznaniya i obosnovanie tretey paradigmy v psihologii i meditsine. Vestnik novykh meditsinskikh tekhnologiy. Elektronnoe izdanie. 2017. No. 1. Pp. 45-54.

The effect of circuit training of submaximal power on the morphofunctional state and physical performance of qualified athletes

UDC 796.015

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Abstract

Objective of the study is to evaluate the effect of training loads of submaximal power, organized by the circular method, on the functional state of athletes of martial arts, game and complex sports in the preparatory period.

Methods and structure of the study. The study was conducted on the basis of the P.F. Lesgaft National State University of Physical Culture, Sports and Health, with the involvement of female athletes from the national teams of the St. Petersburg State University of Industrial Technology and Design. The methods of analysis and generalization of scientific and methodological literature, pedagogical observation, pedagogical testing, mathematical and statistical data processing are used.

Results and conclusions. According to the data obtained, an increase in strength endurance and aerobic-anaerobic productivity has been established. Morphofunctional shifts in body composition were revealed – a decrease in resting heart rate and blood pressure, BMI, and the fat component of the subjects were noted. It is shown that parameters such as the proportion of muscle, water mass and psycho-emotional stability increased at the end of the study. The results obtained allow us to conclude that it is advisable to introduce exercises in a circular form of organization, contributing to an increase in the level of general physical fitness.

Keywords: *sports training, functional qualities, circular method, performance capacity.*

Introduction. The relevance of the research topic is due to the intensive development of sports training theory and methodology, which places increased demands on the search for effective training methods aimed at the comprehensive development of athletes' functional qualities [3, 4]. In the context of growing competition and intensification of training loads, the development of scientifically based approaches to planning, ensuring both increased performance and preservation of athletes' health, is of particular importance [2, 3].

In modern sports practice, there is a steady trend towards the use of circuit training, which has proven its effectiveness for the development of strength endurance and aerobic-anaerobic capabilities [1, 5].

Despite the widespread use of this technique in fitness and some sports, its targeted application in the training of qualified athletes specialising in martial arts, team sports and sports requiring complex coordination during the general training period remains insufficiently studied.

Of particular importance is the study of the adaptive processes that occur during the above-mentioned period, when the basic foundation of athletic form is laid [6]. During this period, the basis for subsequent specialised work is formed, which makes the task of optimising general training methods, including circuit training, one of the priorities in the sports training system [5].

Objective of the study is to evaluate the effect of training loads of submaximal power, organized by the circular method, on the functional state of athletes of martial arts, game and complex sports in the preparatory period.

Methods and structure of the study. The research was conducted at the P.F. Lesgaft National State University of Physical Education, Sport and Health, with the participation of female athletes who are members

of the national teams of the Saint Petersburg State University of Industrial Technologies and Design.

The study involved 32 female athletes aged 20-23, with the sports qualification of candidate master of sports, representing national teams from various sports. The control group (n=16) underwent medium-intensity circuit training (70% of 1PM) during a 2-month basic mesocycle, with a frequency of 3 times per six-day microcycle in the morning and evening. The duration of the exercise in the circuit varied from 30 to 60 seconds, and its change occurred with the alternation of microcycles until the end of the study: the first week was the maximum power zone, the second was the submaximal zone. The training programme included a set of multi-joint functional exercises: weighted squats, push-ups, lunges, jumping rope, standing barbell curls (6 kg), planks, back extensions, bent-over barbell rows (10 kg), and running in place. The exercises were performed using a combination of dynamic and isometric muscle contraction modes.

Results of the study and discussion. The results of the study demonstrate a pronounced adaptive restructuring of the functional systems of the athletes' bodies under the influence of submaximal power circuit training, which is reflected in the positive dynamics of external respiration, cardiovascular status, body composition, and aerobic performance indicators, as shown in the table.

The formation of an adaptive response is characterised by a balanced ergokinetic profile, in which the activation of aerobic energy supply is accompanied by the optimisation of oxygen transport function and the redistribution of the body's functional reserves towards the economisation of regulatory systems.

Analysis of spirometric indicators revealed a significant increase in vital lung capacity from 3.80 to 4.10 litres, corresponding to an increase of 7.9% ($p<0.05$), as well as a marked increase in forced expiratory volume in the first second from 3.20 to 3.60 litres, reflecting a 12.5% increase in functional airway capacity ($p<0.05$). The positive dynamics of respiratory volume from 85.0 to 88.1% and an increase in total ventilation efficiency (TVE) by 4.6% indicate an improvement in ventilation-perfusion ratios and an increase in the ef-

Table 1. Dynamics of changes in the indicators of the athletes' systems

Test/indicator	Control group (before)	Stage	Control group (after)	p	Increase % Before/after
Spirometry					
VC (l)	3,80	3,99	4,1	<0,05	+7,9%
Forced expiratory volume in 1 second (l)	3,20	3,32	3,6	<0,05	+12,5%
Respiratory volume in (%)	85,0	87,55	88,1	<0,05	+3,7%
TVE l/sec	6,50	6,6	6,8	<0,05	+4,6%
HR/BP					
HR, bpm	78,5 ± 2,2	76,9 ± 2,0	70,1 ± 1,8	<0,01	11.98%
Systolic BP, mm Hg	116,9 ± 2,8	115,7 ± 3,1	110,2 ± 2,7	<0,05	6.08%
Diastolic BP, mm Hg	74,6 ± 1,6	74,2 ± 1,8	70,3 ± 1,5	<0,05	6.12%
Bioimpedance measurement					
Weight, kg	61,0 ± 0,9	60,95 ± 0,9	60,90 ± 1,0	>0,05	- 0,16
BMI, kg/m^2	21,7 ± 0,3	21,09 ± 0,35	21,07 ± 0,36	>0,05	- 2,95
Fat mass, %	19,8 ± 1,1	19,4 ± 1,0	19,0 ± 1,1	>0,05	-4,04
Fat mass, kg	12,08 ± 0,7	11,83 ± 0,7	11,58 ± 0,8	>0,05	- 4,08
Muscle mass, kg	28,6 ± 0,9	28,8 ± 0,9	29,0 ± 1,0	>0,05	+1,40
Water percentage, %	67,1 ± 1,2	67,32 ± 1,2	67,54 ± 1,3	>0,05	+0,66
Bone mass	2,6 ± 0,08	2,61 ± 0,08	2,62 ± 0,09	>0,05	+0,77
BMR, kcal/day	1535 ± 25	1542 ± 27	1550 ± 30	>0,05	+0,98
Metabolic age	26± 3	25± 3	24± 3	>0,05	-7,69
MOC / PWC_{170}					
MOC, ml/kg/min	42,6 ± 1,1	43,1±1,1	44,2±1,2	>0,05	+3,76
PWC_{170}, kgm/min	910 ± 25	921±25	936±26	>0,05	+2,86

ficiency of alveolar gas exchange, which together indicate an increase in the functional capacity of the respiratory system and pulmonary ventilation reserves.

Cardiovascular parameters also underwent significant changes: a significant decrease in heart rate from 78.5 to 70.1 beats per minute was noted, corresponding to a decrease of 11.98% ($p<0.01$), as well as a decrease in systolic blood pressure from 116.9 to 110.2 mm Hg and diastolic blood pressure from 74.6 to 70.3 mm Hg ($p<0.05$). The identified shifts indicate the formation of a more economical haemodynamic regime, an increase in stroke volume and a decrease in chronotropic load on the myocardium at rest, which can be considered an indicator of improved vegetative regulation of cardiac activity and growth of central adaptation mechanisms.

The observed changes in bioimpedance measurements showed relative stabilisation of body weight with a simultaneous positive transformation of the component composition. During the experiment, there was a decrease in the proportion of fat mass from 19.8% to 19.0% and its absolute volume from 12.08 to 11.58 kg, accompanied by an increase in muscle mass by 1.4% (from 28.6 to 29.0 kg). An increase in the percentage of water in the body by 0.66% in the absence of pronounced fluctuations in the bone component and basal metabolic rate indicates the stabilisation of intracellular homeostasis and the maintenance of metabolic balance against the background of increased training load in athletes.

Aerobic and functional performance indicators also showed positive dynamics: maximum oxygen consumption increased from 42.6 to 44.2 ml/kg/min (an increase of 3.76%), and the physical performance indicator PWC170 increased from 910 to 936 kg/min (an increase of 2.86%). These changes indicate the activation of oxidative ATP resynthesis pathways, increased efficiency of the peripheral utilisation link of the oxygen transport system, and an increase in the integral functional capacity of the cardiorespiratory system.

Taken together, the results demonstrate that submaximal power circuit training leads to complex physiological adaptation affecting the respiratory, cardiovascular, and metabolic systems, which increases the body's resistance to repeated training-related stressors.

Conclusions. Submaximal power training loads, organized using a circular method, cause pronounced adaptive shifts in the functioning of the cardiorespiratory system of female athletes, manifested in increased ventilation efficiency of the lungs and economization of cardiac activity, which is confirmed by a decrease in heart rate by almost 12% and a tendency towards normalization of blood pressure. At the same time, there is an optimisation of the morphofunctional profile of the body in the form of a redistribution of tissue components and an increase in aerobic energy supply, as evidenced by an increase in MOC and $PWC_{170,}$ which forms the basis for increased performance and resistance to stress.

In general, submaximal intensity circuit training can be considered a physiologically sound tool for improving health and aimed at enhancing the functional state of athletes by mobilising reserve capacities and stabilising systemic regulation.

References

1. Alzhanov H.H., Krylova T.I., Matyunina N.V. Vliyanie krugovoy trenirovki na fizicheskuyu i funktsionalnuyu podgotovlennost studentov vuza. Uchenye zapiski universiteta im. P. F. Lesgafta. 2025. No. 2(240). Pp. 13-19.
2. Koblova V.S., Apoyko R.N., Tarakanov B.I. Eksperimentalnaya tekhnologiya podgotovki zhenshchin-bortsov vysokoy kvalifikatsii s aktsentom na povyshenie effektivnosti profilaktiki travmatizma. Uchenye zapiski universiteta im. P. F. Lesgafta. 2021. No. 6(196). Pp. 155-160.
3. Kuramshin Y.F. Problema «kachestv» v teorii fizicheskoy kultury: sovremennoe sostoyanie i puti resheniya. Teoriya i praktika fizicheskoy kultury. 2021. No. 10. Pp. 14-16.
4. Myakinchenko E.B., Kryuchkov A.S., Missina S.S. Obsuzhdenie «tsentralnyh» i «perifericheskih» faktorov aerobnoy proizvoditelnosti i realizatsionnoy effektivnosti v kontekste spetsialnoy rabotosposobnosti sportsmenov v vidah sporta na vynoslivost (obzor literatury). Vestnik sportivnoy nauki. 2020. No. 4. Pp. 41-47.
5. Smirnova Y.V., Saikina E.G., Zyukin A.V., Shunkin V.S. Effektivnost kompleksnogo primeneniya sredstv krossfita i boksa v protsesse fizicheskoy podgotovki sotrudnikov spetspodrazdeleniy. Teoriya i praktika fizicheskoy kultury. 2021. No. 9. Pp. 35-37.
6. Shchedrina Yu.A., Melnikov D.S., Chernozipunnikova E.V., Terekhin V.S. Variabelnost ritma serdtsa pri provedenii aktivnoy ortostaticheskoy proby u vysokokvalifitsirovannyh bokserov-professionalov v period podgotovki k sorevnovaniyam. Teoriya i praktika fizicheskoy kultury. 2024. No. 9. Pp. 26-28.

Analysis of the dynamics of the Russian Federation's Greco-Roman wrestling team's medal count at world championships

UDC 796.82

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Abstract

Objective of the study is to analyse the dynamics of the Russian national team's success at world championships in Greco-Roman wrestling.

Methods and structure of the study. An analysis of the Russian national team's medal count in Greco-Roman wrestling at world championships between 1996 and 2024 was conducted. The study covers seven four-year training cycles.

Results and conclusions. Based on an analysis of statistical data, the results of our wrestlers' performances are examined in terms of their dominance on the international stage in the 1990s and their sharp decline in recent years. Particular attention is paid to factors contributing to the decline in performance: the lack of a systematic approach to training the next generation of athletes, restrictions on participation at the international level, and increased competition from new leaders. The specifics of the organisation of competitive activities related to changes in the number of weight categories and training methods are taken into account. The decline in the medal count at world championships is not accidental, but reflects existing problems in the current system of training the national team. Recommendations are made for modernising training and restoring the leading positions of Russian Greco-Roman wrestlers in the international arena.

Keywords: *Greco-Roman wrestling, analysis, international competitions, Russian national team.*

Introduction. Greco-Roman wrestling is one of the oldest sports included in the Olympic programme. Known as 'French wrestling,' it has been popular since pre-revolutionary Russia. Our country has traditionally been considered one of the leaders in this sport. However, over the past three decades, there have been significant changes in both the organisation of international competitions and approaches to training athletes. An analysis of the medal count at world championships between 1996 and 2024 revealed not only the evolution of the Russian wrestling school, but also a general redistribution of power in the world of Greco-Roman wrestling [1].

Objective of the study is to analyse the dynamics of the Russian national team's success at world championships in Greco-Roman wrestling.

Methods and structure of the study. The analysis covers seven four-year cycles, which corresponds to the Olympic Games periodisation and provides grounds for discussing long-term prospects [2].

The analysis is based on data from official UWW reports on the number of gold medals won by national teams at world championships. Each time period includes three consecutive world championships, which ensures the representativeness of the sample.

The data are presented in absolute and relative values, which allows for comparison of performance effectiveness against the backdrop of changing numbers of medal sets and participants.

The data presented shows the percentage distribution of gold medals won by national teams at world championships for the period 1996-2024, identifying the leading countries in each cycle (Figs. 1-7).

Results of the study and discussion. Since 1996, 21 world championships have been held, where sets of awards were played for in Olympic and non-Olympic weight categories. Let's look at the first cycle – from 1996 to 2000.

In the early post-Soviet era, Russian Greco-Roman wrestlers won nine gold medals (37% of the total). This

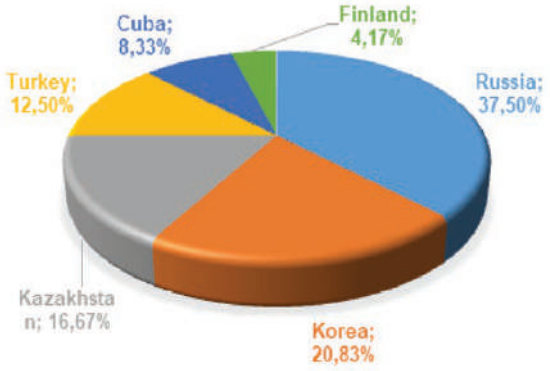

Figure 1. Percentage of gold medals won at world championships in the 1996-2000 cycle

was a period of stable influence of the Soviet wrestling school, when Russian wrestlers showed high competitiveness. South Korea and Kazakhstan occupied the second and third positions, respectively, demonstrating the active development of Greco-Roman wrestling in Asia.

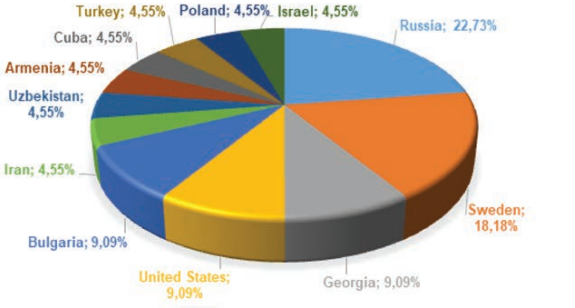

Figure 2. Percentage of gold medals won at world championships in the 2000-2004 cycle.

In the next cycle, Russia still maintained a high level of performance, but there was already a slight decline to 23% (5 gold medals). The Swedish national team took the lead, proving to be a serious competitor during this period. Many new wrestlers from different countries also appeared, vying for the highest medals. This was evidence of the globalisation of sport in general and a serious increase in competition in Greco-Roman wrestling.

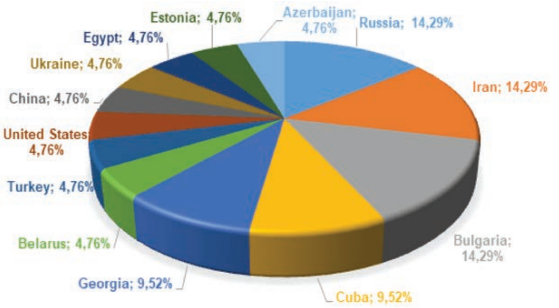

Figure 3. Percentage of gold medals won at world championships in the 2004-2008 cycle

This period was a time of equilibrium, with Russia sharing the lead with Iran and Bulgaria, whose national teams won three gold medals each. Representatives from China, Egypt and Estonia began to perform well at world championships, indicating the further expansion and popularisation of Greco-Roman wrestling around the world.

Figure 4. Percentage of gold medals won at world championships in the 2008-2012 cycle

In the period 2008-2012, the emerging loss of leadership became apparent. Russia shared third place with Azerbaijan in terms of the number of gold medals, with a result of 14% (3 gold medals each). Meanwhile, the leader, Iran, had already won 5 gold medals (24%), and Turkey was in second place with 4 gold medals (19%).

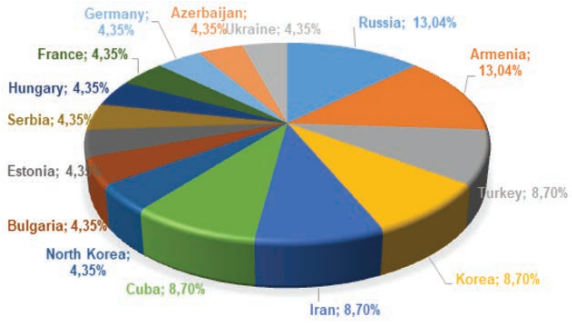

Figure 5. Percentage of gold medals won at world championships in the 2012–2016 cycle

During the period from 2012 to 2016, Russia shared the leading position with Armenia, but their combined contribution amounted to only 13% of all awards. For the first time, the results of wrestlers from North Korea and Serbia increased significantly, which was due to intensified preparation for the Olympic Games and the development of the 'Sport as a Soft Power Tool' programme.

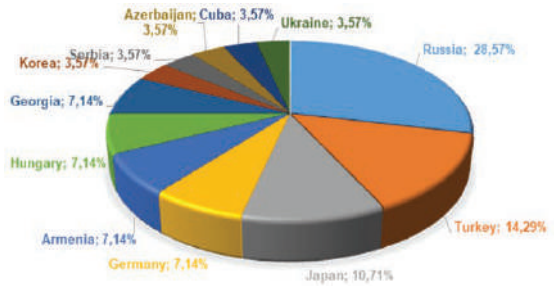

Figure 6. Percentage of gold medals won at world championships in the 2016–2021 cycle

In 2016-2021, Russia returned to the ranks of leaders, winning 8 gold medals (29%), but it is worth noting that at the beginning of the cycle at the 2017 World Championships, the Russian national team returned home without any gold medals for the first time in a long time. This fact could not go unnoticed, and at the next two World Championships (2018 and 2019), the team redeemed itself, performing more than successfully.

It is worth noting that during this period, Turkey and Japan established themselves as constant competitors, while Armenia and Hungary also strengthened their roles.

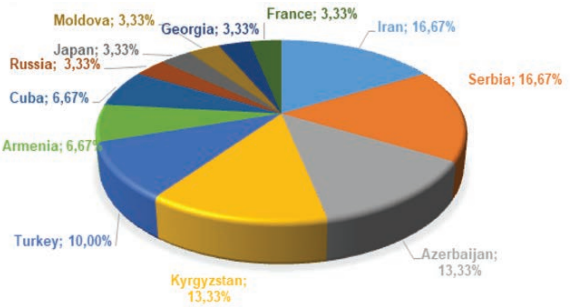

Figure 7. Percentage of gold medals won at world championships in the 2021-2024 cycle.

Unfortunately, the last period has been marked by a sharp decline in Russia's position in the world rankings: the national team has only won one gold medal. Iran and Serbia have become the leaders, each winning five gold medals. Azerbaijan and Kyrgyzstan have strengthened their influence, especially in weight categories previously dominated by Russians. Russia has fallen behind countries such as France and Moldova, which has naturally caused concern in the sporting community.

As a weak excuse, it is worth noting that the Russian national team missed the 2022 World Championships due to political disagreements within the International Olympic Movement.

Conclusions. The results of the Russian national Greco-Roman wrestling team and its medal count at world championships between 1996 and 2024 were influenced by both geopolitical changes (the collapse of the USSR) and trends in the improvement of the international competition system (changes in weight categories, number of medal sets awarded), and the ban on our wrestlers participating in top-level competitions due to political differences within the International Olympic Movement.

While Russia controlled almost 40% of all gold medals in the 1990s, by 2024 its share had fallen to 3%.

In our opinion, the future of Russian Greco-Roman wrestling depends on restoring the system of mass influx of participants, developing children's and youth schools, and introducing modern methods of working with young talents. A new strategy for financing local sports federations should be developed.

In order for the Russian Greco-Roman wrestling team to return to the top of the world rankings, it is necessary to review the content, planning and training system, taking into account the changed conditions for participation in international competitions; identify gaps in the organisation of work with the sports reserve; and review the criteria for selecting candidates for the national team. Without these steps, it is unlikely that the team will return to its former level.

References

1. Avakyan A.G., Levitskiy A.G., Nerobeev N.Yu. Sovremennye metody regulyatsii vesa v sportivnoy borbe. Aktualnye problemy fizicheskoy i spetsialnoy podgotovki silovykh struktur. 2024. No. 4. Pp. 180-184.
2. Kuvanov V.A., Zaytsev A.V., Ilyushchenko S.A., Murasheva M.V. Otsenka fizicheskoy podgotovlennosti kvalifitsirovannyh bortsov-yuniorov volnogo stilya kak sredstvo effektivnogo upravleniya uchebno-trenirovochnym protsessom. Teoriya i praktika fizicheskoy kultury. 2024. No. 4. Pp. 21-23.
3. Leontev E.D. Sport kak element «myagkoy sily» v arsenale sredstv vneshnepoliticheskoy deyatelnosti gosudarstva. Vestnik Moskovskogo gosudarstvennogo lingvisticheskogo universiteta. Obshchestvennye nauki. 2022. V. 1(846). Pp. 40-44.

Improving the rhythm perception of teenage footballers

UDC 796.332

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Abstract

Objective of the study is to improve the rhythmic abilities of 15-16-year-old adolescents through football techniques and **exercises.**

Methods and structure of the study. 46 athletes from a sports school in Moscow took part in the pedagogical experiment. Children from the control group followed the standard programme, while children from the experimental group performed special exercises to develop their sense of rhythm for 15 minutes during each training session. Rhythm ability was assessed using the 'Pull the ball with the foot' test, as well as the 'Snake' test, which assesses the overall technical preparedness of footballers.

Results and conclusions. Before the start of the study, there were no significant differences ($p>0.05$). After the educational experiment, the results in the control group in the 'Pull the ball with the foot' test improved from 6.1±0.2 to 5.7±0.1 ($p>0.01$), and in the 'Snake' test from 9.8±0.6 to 9.1±0.5 ($p>0.01$). These results indicate the low effectiveness of the standard programme for developing technical skills and a sense of rhythm in 15-16-year-old footballers. The experimental group's results in the 'Pull the ball with the foot' test improved from 6.2±0.3 to 5.1±0.1 ($p<0.01$), and in the 'Snake' test, the results improved from 9.7±0.5 to 8.2±0.4 ($p<0.01$), which indicates the effectiveness of introducing special exercises to improve rhythm in the training process for footballers.

The systematic use of means and methods for developing agility, in particular rhythm ability, in football training sessions with athletes aged 15-16 has a visible positive effect on the technical preparedness of football players and significantly improves their sense of rhythm.

Keywords: *teenagers, footballers, rhythm, exercises, indicators.*

Introduction. Achieving maximum athletic results is only possible if the athlete has a high level of technical and physical training and possesses theoretical, tactical, and psychological training.

Many scientific studies have examined the technical training of athletes of different ages. It is known that the basis of technical skill is coordination of movements or agility [1, 3, 8]. Agility is the ability to rationally solve motor tasks. As a rule, all abilities, including agility, are differentiated into specific ones, such as a sense of rhythm, balance, movement in space, throwing accuracy, and others.

To train the ability to sense rhythm, it is recommended to use didactic patterns of motor action formation, individual and group models of motor action construction, modern teaching technologies, adequate forms of pedagogical control, models of success prediction, psychological indicators of response to physical exertion, and others [2, 5, 8].

Special agility in a chosen sport, including football, solves tasks that form specific aspects of a footballer's competitive activity. Such agility includes a sense of motor rhythm, kinesthetic differentiation of motor parameters, spatial orientation, combination of movements, quick reaction, and maintaining balance in different conditions. For a footballer, one of the most important components of agility is a sense of motor rhythm, which implies the correct and accurate reproduction of a given rhythm of motor actions or its adequate variation depending on changing conditions [6, 7].

A high level of rhythm ability is demonstrated by athletes who have achieved significant results in game and coordination sports. However, today, football sports schools do not devote enough time to specific coordination training, despite the presence of sections in the programme on general and special physical training.

Objective of the study is to improve the rhythmic abilities of 15-16-year-old adolescents through football techniques and exercises.

Methods and structure of the study. 46 athletes from a sports school in Moscow took part in the pedagogical experiment, divided into a control group and an experimental group. The athletes trained five times a week for 90 minutes. The pedagogical experiment lasted five months (January-May 2025).

All athletes followed the standard football training programme, but in the experimental group, to improve their rhythmic abilities, after a short 15-minute warm-up, the footballers performed exercises aimed at improving their sense of rhythm. The load was increased gradually by increasing the number of exercises and reducing rest time.

The following exercises are effective for developing a sense of rhythm:

1. Running exercises: shuttle run (running segments while changing direction, which develops sharpness and the ability to switch quickly), zigzag run (running around cones), running with a change of direction (running in a straight line and changing direction sharply at the coach's signal).

2. Sprints with stops: running short distances (10-15 metres) and either jumping up or stopping sharply.

3. Obstacle running: jumping over 1.5-metre-high bars placed 2 metres apart.

4. Exercises with a skipping rope and ball: jumping rope (jumping intensively, trying to increase speed and endurance), running in place with high knee lifts, ball exercise 'Eight' with the ball around the feet (dribbling the ball, rolling it with the feet around the feet in a half-squat, zigzag dribbling (dribbling the ball between cones, changing speed and using different parts of the foot), juggling (increase the tempo when juggling the ball, setting goals for the number of touches without dropping it), passing and dribbling exercise (perform passes of different lengths while moving, as well as feints). [4, 6, 7].

To train exercises that are difficult to perform, the standard method of repeated exercise performance was used. To change the way the exercise was performed, a variable method was used. Game and competitive methods were used to improve the exercises.

To determine the footballers' sense of rhythm, the 'Pulling the ball with the foot' test was used (Fig. 1).

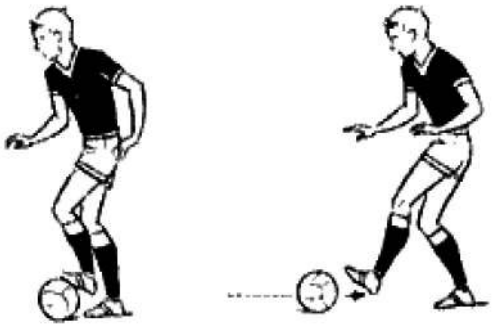

Figure 1. Pulling the ball with the foot

At the coach's signal, you must pull the ball up with the sole of your foot as quickly as possible, moving backwards. After each touch of the ball, the sole of your foot must touch the ground. You must perform a total of 10 touches of the ball and the ground. The best result from two attempts is recorded with an accuracy of 0.01 seconds.

The standard 'Snake' test was also used to determine the overall technical level of the footballer (Fig. 2).

Figure 2. Snake

The Snake test involves juggling the ball, then dribbling around cones and finally shooting at the goal.

The exercise begins with juggling (three touches of the ball with either foot). Then the ball is dribbled around four cones (the distance between the cones is 2.5 metres), after which the ball must be kicked and a goal scored. If the ball does not hit the target, the exercise is not completed. Result: the best of two attempts is recorded with an accuracy of 0.01 seconds.

To determine the reliability of the research results, the data was processed using mathematical statistics methods. A parametric criterion (Student's t-test) was used. Statistical processing was performed us-

ing standard statistical software Microsoft Excel 2007. Results with p> 0.01 were considered reliable.

Results of the study and discussion. Before the start of the study, two groups were formed in such a way that there were no significant differences between them in both tests (p>0.05).

After the end of the pedagogical experiment, the results in both groups changed differently. For example, in the control group, the result in the 'Pulling the ball with the foot' test improved from 6.1±0.2 to 5.7±0.1 (p>0.01), and in the 'Snake' test from 9.8±0.6 to 9.1±0.5 (P>0.01). These results indicate the low effectiveness of the standard programme for developing technical skills and a sense of rhythm in 15-16-year-old footballers.

The experimental group showed a significant improvement in results. The results in the 'Pulling the ball with the foot' test improved from 6.2±0.3 to 5.1±0.1 (p<0.01), and in the 'Snake' test, the results improved from 9.7±0.5 to 8.2±0.4 (p<0.01), which indicates the effectiveness of introducing special exercises to improve rhythm in the training process for footballers.

It should be noted that agility is crucial for the development of technical skills in football players of any age. Coordination abilities are quite diverse and are classified in different ways [1, 3, 4]. Most authors recommend training all known abilities equally, including motor rhythm ability [1, 2, 7].

Analysis of the studies indicates the need for selective training of motor rhythm in footballers. This also applies to the development of agility in children aged 15-16.

The scientific novelty of the study lies in the fact that it presents specific means and methods of training the motor rhythm of footballers aged 15-16 with experimentally proven effectiveness.

In the future, it is necessary to study the introduction of other coordination abilities into the training process of footballers of different ages and evaluate their effectiveness, since the standard training programme for footballers requires a constant search for modern means and methods to achieve maximum sports results not only in domestic but also in world football in the future. At the same time, it is important to take into account both the sensitive periods of motor skill development [4] and the level of intellectual development of children of different ages and physical fitness [5] in the training process.

Conclusions. Thus, the systematic use of means and methods for developing agility, in particular the ability to keep rhythm, in football training sessions with athletes aged 15-16 has a visible positive effect on the technical preparedness of footballers and significantly improves their sense of rhythm. The data obtained are of practical interest to coaches at sports schools and teachers at higher education institutions.

References

1. Alexandrova V.A., Skotnikova A.V., Solovev V.B., Ovchinnikov V.I. Sovershenstvovanie sistemy fizicheskoy podgotovki v mladshey shkole. Teoriya i praktika fizicheskoy kultury. 2021. No. 12. Pp. 109-111.
2. Polevoy G.G. The ability to rational relaxation of the muscles in children who are engaged in football taking into account their nervous system. Bangladesh Journal of Medical Science. 2021. No. 20(1). Pp. 58-61. DOI: 10.3329/bjms.v20i1.50346.
3. Polevoy G.G. Development of coordination abilities of mentally retarded children in physical education lessons. Bangladesh Journal of Medical Science. 2024. No. 23(4). Pp. 1220-1227. DOI: 10.3329/bjms.v23i4.76552.
4. Polevoy G.G. Endurance and a sensitive period for its development in children. Journal of Physical Education and Sport. 2024. No. 24(3). Pp. 544-551. DOI: 10.7752/jpes.2024.03065.
5. Polevoy G.G. Development of intellectual abilities of school children with the help of exercise Classics. Sri Lanka Journal of Child Health. 2021. No. 50(3). Pp. 442-447. DOI: 10.4038/sljch.v50i3.9693.
6. Sablin A.B., Ulyanova E.A., Latak A.I., Popova N.Yu. Razvitie koordinatsionnyh sposobnostey shkolnikov 10 11 let na osnove imitatsionnogo vspomogatelnogo sredstva. Teoriya i praktika fizicheskoy kultury. 2025. No. 8. Pp. 54-56.
7. Serikova Yu.N., Alexandrova V.A., Nechaeva A.Yu. Assessment of the level of coordination abilities of female students of an unsportsmanlike university. 2019. No. 8. Pp. 39-41
8. Skotnikova A.V., Alexandrova V.A., Serikova Yu. N., Ovchinnikov V.I. Normativnye shkaly otsenki staticheskogo ravnovesiya u mladshih shkolnikov. Teoriya i praktika fizicheskoy kultury. 2024. No. 8. Pp. 74-75.

Comparison of postural control in athletes under different loads

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Abstract

Objective of the study is to analyse and compare the muscle control of athletes under various functional loads.

Methods and structure of the study. The study was conducted at the Research Institute of Physical Culture and Sport at Volga Region State University of Physical Culture. It involved 227 male athletes with at least nine years of experience and sports qualifications ranging from second adult category to master of sports of the Russian Federation. Postural control was assessed using a stabilisation platform with biological feedback in a state of relative rest, as well as after vestibular, speed-strength and cyclic stepwise increasing physical exertion.

Results of the study and discussion. Athletes engaged in situational sports have the most effective postural control system, which is manifested in better stabilography indicators under various functional loads. This is due to the need to compensate for diverse and unpredictable external factors, unlike cyclic sports, where variations are more predictable. Targeted sports, in turn, require high precision of postural adjustments, but not in complex conditions. The study confirms that versatility and skill transfer are formed in sports that require solving non-standard motor tasks in an unstable environment.

Keywords: *sport, postural control, functional indicators, functional loads, comparative analysis.*

Introduction. The ability to control balance is a key indicator that determines the effectiveness of performing various motor tasks and minimises the risk of injury. This is especially relevant in sports activities, which determines the importance of studying the mechanisms of postural control. The question arises: how universal are these mechanisms in various types of functional activities that require maintaining balance?

For example, Kümmel J. et al. showed [4] that balance training in healthy people improves the performance of learned tasks but has little effect on the performance of new motor tasks. This suggests that postural control skills may be specific to a particular activity and not transferable to other sports. This is probably because new, especially unpredictable, motor tasks create difficulties for the postural control system, as prediction plays an important role in ensuring its effectiveness [2].

Another study demonstrated [3] that repeated external impacts of equal force, disrupting postural control, elicited effective corrective responses from the postural system. However, when the force of the impact changed unpredictably, the subjects tended to overestimate or underestimate it, which led to significant disturbances in balance function.

In addition to external factors, the effectiveness of postural control is also influenced by internal factors related to the body's physiological responses, in particular to physical exertion. For example, heart rate and breathing rate have a significant impact on postural control indicators [1].

Thus, despite existing data on the specificity of postural control, comparative responses to diverse loads in athletes whose sports activities place different demands on this system remain insufficiently studied.

Objective of the study is to analyse and compare the muscle control of athletes under various functional loads.

Methods and structure of the study. The research was conducted in the morning at the Research Institute of Physical Culture and Sport at Volga Region State University of Physical Culture. A total of 227 men who had been actively involved in sports for at least nine years were studied. The sports qualifications of the subjects ranged from second adult category to Master of Sports of the Russian Federation (Table 1). Sports included cyclic sports (middle- and long-distance running, cross-country skiing, swimming, and rowing), target sports (shooting), and situational sports (basketball, badminton, volleyball, football, tennis, hockey, and wrestling). The control group of 50 people consisted of non-athletes.

Postural control was assessed using the Stabilan-01 biological feedback stabiliser from the Rhythm Joint Credit Bureau (Taganrog). For this scientific work, the following indicators of balance function quality (BQF, %) were used: confidence area of the ellipse (ELSS, mm2) and linear speed of movement of the centre of pressure (LSS, mm/s).

The physical load used was speed-strength (30 push-ups) and a cyclical step-by-step increasing load on a bicycle ergometer (at the first stage, which lasted 3 minutes, the load was 50 W, then the power was increased by 30 W at each subsequent stage (duration 1 min) up to a heart rate of 170 bpm). The vestibular load was presented in the form of a Voyacek otolith test. These types of loads were used in the following order: assessment of postural control on a stabilisation platform in a state of relative rest, then the effect of vestibular load on postural stability, then the effect of speed-strength and cyclic stepwise increasing load on a bicycle ergometer. There was a 30-minute rest period between the vestibular, speed-strength and cyclic step-incremental loads.

The results of the study were processed using SPSS 27 software, Spearman's correlation analysis and ANOVA with Bonferroni correction.

Results of the study and discussion. Analysis of stabilographic indicators after exercise between the study groups showed that the best linear velocity responses of the centre of pressure were recorded in representatives of situational sports in all functional exercises used (Table 2). This is apparently due to the fact that competitive and training loads have a positive effect on the ability of the postural control system to maintain a vertical posture more effectively. The values for representatives of target sports were closer to those for representatives of situational sports.

The integral indicator of balance function quality was characterised by various changes: at rest, the best values were observed in representatives of situational and target sports, and after vestibular load, the best indicators were observed only in athletes of situational sports. According to the data after speed-strength and cyclic stepwise increasing load, the values for all groups were similar.

To assess the transferability of postural control skills developed during sports activities, as well as their effectiveness in different types of functional loads, a correlation analysis was performed between the studied indicators. It was found that the indicators of linear velocity of the centre of pressure obtained at rest correlate with varying degrees of strength within groups of athletes. The most pronounced values are observed in representatives of situational sports, while in the control group there are practically no correlations. For example, the indicators of linear velocity of the centre of pressure obtained at rest have noticeable correlations with the data after vestibular load: $r=0.70$ ($p<0.001$), while in the control group there are no correlations – $r=0.16$ ($p=0.25$). A similar situation was observed in the group of cyclic sports. At the same time, no correlations were noted in target sports and in the control group.

Table 1. Characteristics of the surveyed contingent

Rank level	Situational sports	Cyclical sports	Target sports	Control group	Total number
No rank	0	0	0	50	50
II rank	9	2	0	0	11
I rank	47	27	1	0	75
CMS	62	11	7	0	80
MS	9	0	2	0	11
Total	**127**	**40**	**10**	**50**	**227**

Table 2. Dynamics of postural control indicators in response to various types of load

Sports	Rest	After vestibular exercise	After speed and strength exercise	After cyclic stepwise increasing exercise
Linear speed of movement of the centre of pressure (LSS, мм/с)				
Situational sports[1]	5,6 ± 0,2[24]	8,5 ± 0,2[234]	8,7 ± 0,2[24]	10,9 ± 0,3[234]
Cyclical sports[2]	7,4 ± 0,3[1]	11,9 ± 0,4[1]	11,2 ± 0,44[14]	14,6 ± 0,44[14]
Target sports[3]	5,6 ± 0,3[4]	11,6 ± 0,4[1]	8,5 ± 0,3[4]	14,0 ± 0,64[14]
Control group [4]	7,5 ± 0,2[13]	14,8 ± 0,3[1]	15,8 ± 0,4[123]	20,1 ± 0,6[123]
Confidence area of the ellipse (ELLS, мм²)				
Situational sports[1]	72,2 ± 1,8[4]	139,5 ± 3,4[234]	129,4 ± 2,3[234]	230,6 ± 3,9[234]
Cyclical sports[2]	78,2 ± 2,8[4]	190,9 ± 7,3[14]	144,2 ± 3,6[14]	257,4 ± 5,8[14]
Target sports[3]	66,9 ± 3,0[4]	251,7 ± 14,6[1]	162,5 ± 5,9[1]	297,8 ± 10,6[1]
Control group [4]	99,5 ± 2,7[123]	258,8 ± 8,4[12]	248,6 ± 5,8[12]	430,8 ± 10,0[123]
Balance function quality (BQF, %)				
Situational sports[1]	89,9 ± 0,3[24]	81,7 ± 0,4[234]	82,2 ± 0,4[24]	80,1 ± 0,4[4]
Cyclical sports[2]	85,2 ± 0,6[13]	76,5 ± 0,7[14]	79,8 ± 0,6[14]	78,2 ± 0,6[4]
Target sports[3]	90,6 ± 0,6[24]	75,0 ± 1,0[1]	79,6 ± 0,8[4]	80,3 ± 1,0[4]
Control group [4]	84,0 ± 0,6[13]	68,2 ± 0,7[12]	70,5 ± 0,7[123]	66,4 ± 0,8[123]

Note: Indices above group names indicate group designations; indices above numbers indicate statistically significant differences between groups, according to the indices above the groups. Value α=0.05, taking into account the Bonferroni correction.

In athletes of situational sports, the data on the linear velocity of the centre of pressure at rest correlated with the indicators after speed-strength load – r=0.76 (p<0.001) and after cyclic stepwise increasing load – r=0.50 (p<0.001). In athletes of cyclic sports, after vestibular load – r=0.50 (p<0.001), after speed-strength training – r=0.80 (p<0.001) and a weak correlation after cyclic stepwise increasing training – r=0.30 (p<0.05). No correlations were observed in athletes in target sports, and in the control group, only the relationship between the values of the linear velocity of the centre of pressure at rest and the data after speed-strength load remained – r=0.38 (p<0.01).

Similar correlations were found for other indicators studied, but their number was smaller; representatives of target sports and the control group were characterised by fewer correlations. Perhaps the presence of strong correlations between indicators at rest and after various functional loads in athletes of situational sports indicates a universal and flexible pattern of balance regulation formed in the course of their activity, which effectively works to compensate for heterogeneous disturbances – the neurophysiological basis for the transfer of postural control skills in different situations. At the same time, only in the group of athletes in situational sports is there a weak but statistically significant correlation between postural control indicators and the level of athletic skill (r=0.25–0.33; p=0.001–0.007) . In athletes of target sports, the skill is well manifested mainly at rest and is poorly transferred to other conditions, while in the control group, a low level of postural control is observed both at rest and after exercise.

Conclusions. Thus, according to three stabilographic indicators and for all types of functional loads, only athletes in situational sports demonstrated the best (or close to the best) values of postural control. This probably indicates a more efficient and economical functioning of their postural control system, both at rest and when compensating for various external factors. This can be explained by the fact that it is in situational sports that the greatest combination of factors and their strength is formed, while cyclic sports pose less demanding tasks for postural control and solve them in conditions of predictable variations in external factors. At the same time, target sports, although they do not place high demands on postural control in complex conditions, require the highest accuracy in the adjustment process. The results were worse in the control group.

It has been shown that the greatest versatility and ability to transfer skills are formed in those sports

where the activity initially requires constant solving of non-standard motor tasks in unstable and unpredictable environments.

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References

1. Nazarenko A.S., Mavliev F.A. Podderzhanie ravnovesiya tela na fone fizicheskogo utomleniya myshts plechevogo poyasa u sportsmenov raznyh spetsializatsiy. Nauka i sport: sovremennye tendentsii. 2015. V. 9. No. 4(9). Pp. 21-25.
2. Kaewmanee T., Aruin A.S. The role of predictability of perturbation in control of posture: a scoping review. Motor control. 2021. V. 26. No. 1. Pp. 97-143.
3. Kaewmanee T., Liang H., Aruin A.S. Effect of predictability of the magnitude of a perturbation on anticipatory and compensatory postural adjustments. Experimental brain research. 2020. V. 238. No. 10. Pp. 2207-2219.
4. Kümmel J., Kramer A., Giboin L.S., Gruber M. Specificity of balance training in healthy individuals: a systematic review and meta-analysis. Sports Medicine. 2016. V. 46. No. 9. Pp. 1261-1271.

Ideomotor representations in the training of qualified fencers-sabre fighters

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Abstract

Objective of the study is to identify and explain the need to apply the method of complicating ideomotor representations in training highly skilled sabre fencers.

Methods and structure of the study. An analysis of 42 scientific and methodological sources for 2000-2024 from the LIBRARY.ru, Scopus and PubMed databases was conducted, including works by Russian fencing specialists and studies by foreign authors. Content analysis, comparative analysis and theoretical modelling methods were used.

Results and conclusions. It has been established that ideomotor training statistically significantly improves the technical and tactical reliability, anticipation, and mental self-regulation of sabre fencers. A model of ideomotor training has been developed that integrates the Russian concept of special methods for technical and tactical improvement (preliminary modelling of given situations, serial combat, complication of ideomotor representations when choosing actions with anticipation of distance characteristics of weapon interactions) and the principles of functional equivalence of the PETTLEP model.

The complication of ideomotor representations ensures the development of cognitive flexibility, operational thinking and creative tactical behaviour of sabre fencers through four interrelated methods: a) preliminary modelling of the probable sequence of actions in a single bout; b) modelling a probabilistic sequence of actions through an 'if-then' system; c) independent choice and verbal commitment of the athlete to take action; d) anticipating the distance and momentary characteristics of weapon interactions.

Keywords: *fencing, sabre fencers, complication method, high qualification, physical training.*

Introduction. Sabre fencing is a fast-paced combat sport where the outcome is determined not by absolute speed of movement, but by the athlete's reaction, anticipatory prediction and execution of selected actions [1-3]. The reaction time between visual perception and action is 0.18-0.24 seconds [1], which makes the improvement of cognitive and perceptual components a priority in training.

The Russian fencing school traditionally views the training of sabre fencers as a system of interaction between sensorimotor, cognitive and volitional mechanisms. According to the concept of special methods of technical and tactical improvement, the methods of training motor qualities and mastering motor actions, which are generally accepted in sports theory, are used to solve specific problems of improving the technical, tactical and functional training of fencers [1-3].

Ideomotor training (IMT), developed in the works of Russian psychologists and experimentally confirmed in the works of Guillot A. and Collet C. [7, 8], allows the same areas of the brain to be activated as in real movement. A meta-analysis by Toth A.J. et al. confirmed the average effect of IMT d = 0.43 [12], which is consistent with the data from studies in fencing [4, 9].

Despite its recognised effectiveness, the issue of integrating the Russian concept of complexification

of training with modern data from cognitive neuroscience remains insufficiently studied. In particular, there is no systematic description of methods for complicating ideomotor representations when selecting and applying actions, taking into account the specifics of sabre fencing.

Objective of the study is to identify and explain the need to apply the method of complicating ideomotor representations in training highly skilled sabre fencers.

Methods and structure of the study. The research was conducted in three stages during 2023-2024. The first stage involved analysing scientific and methodological literature. Sources were selected from the LIBRARY.ru, Scopus and PubMed databases for 2000-2024. The second stage involved a comparative analysis of Russian and foreign methodologies. The following were studied: the Russian concept of special methods of technical and tactical improvement [2, 3]; the PETTLEP model (Holmes P., Collins D.) [10]; data on the psychophysiology of anticipation in fencers (Borysiuk Z., Hagemann N.) [4, 9]. The third part consists of theoretical modelling of a four-level system of ideomotor representation complexity, integrating ideomotor training methods when choosing actions.

Results of the study and discussion. The effectiveness of ideomotor training in sports has been confirmed many times by specialists. A meta-analysis by Toth A.J. et al. [12], based on 133 studies (N=3602), confirmed the average effect of ideomotor training d=0.43 (95% CI: 0.35-0.47), which is consistent with the classic data of Driskell J.E. [6] and modern works by Guillot A. and Collet C. [7, 8]. In sabre fencers, this approach increases movement accuracy, cognitive readiness, and emotional stability [1, 4, 9]. Studies show that including 10-15-minute ideomotor sessions 3-5 times a week in the microcycle structure of highly skilled sabre fencers leads to a 12-18% improvement in tactical reliability [1, 3]. Cognitive and anticipatory characteristics are particularly important for sabre fencers. A study by Hagemann N. et al. [9] using temporal occlusion showed that experienced fencers were 72-120 ms faster than novices in recognising their opponent's attacking intentions. Similar data were confirmed by Borysiuk Z. [4]. The neurophysiological mechanisms of ideomotor training ensure its effectiveness. fMRI data (Guillot A., Collet C., Kosslyn S.M.) [7, 8, 11] prove the identity of activation of the prefrontal cortex and premotor area of the cerebral cortex during real and mental action. This confirms functional equivalence – the basic principle of the PETTLEP model [9]. Decety J., Jeannerod M. [5] found that mental performance of an action activates the same neural networks as real performance, with the exception of the primary motor cortex. This explains the mechanism of forming stable motor programmes through ideomotor training.

Complexification of ideomotor representations within the Russian concept of comprehensive training and the application of special methods of technical and tactical improvement. The Russian fencing school defines complexification as 'the gradual building of connections between the technical, tactical, cognitive, and mental components of training' [1, 2]. In practice, this is implemented through special methods of technical and tactical improvement, as well as through the complication of ideomotor representations, which allows athletes to develop deeper and more flexible cognitive skills necessary in competitive confrontation. According to the Russian concept of training fencers, the complication of ideomotor representations in the selection and application of actions is aimed at forming the ability to make conscious choices of technical and tactical actions in conditions of spatial and temporal uncertainty [2]. This process can be implemented through the consistent application of interrelated methods.

a) Preliminary modelling of the probable sequence of actions in a single bout. In each bout (15 hits), athletes perform a large number of effective fencing exchanges, each of which ends with interaction with the opponent's weapon. Therefore, it is necessary to mentally 'play through' the sequence of the most probable tactical combinations in advance [2, 3]. The practical implementation of this method is as follows. Before an individual lesson, the athlete models a probable scenario of confrontation with a specific opponent. Then the athlete builds a specific algorithm for ending the bout. For example, the coach performs a preparatory action with a batman on the athlete's blade → the athlete performs a counterattack with a retreat; if the coach moves on to an attack after the retreat → the athlete applies a defence with a response; if the coach maintains a long distance → the athlete applies an attack with a feint.

Such modelling activates the prefrontal cortex (responsible for strategic planning) and the premo-

tor cortex, which is confirmed by fMRI data (Guillot & Collet) [7, 8]. Moreover, studies show that anticipation based on pre-constructed scenarios reduces the latent reaction period by 72-110 ms [9].

b) Modelling a probabilistic sequence of actions through an 'if-then' system. While the previous method focuses on the overall probabilistic picture of the fight, this method focuses on the details within a single combat situation, taking into account changes in the situation. In fact, this is training in multi-level decision-making. For example, an athlete mentally plays out a chain of thoughts: I plan to attack with a feint if the opponent reacts with a defence → I finish the attack with a feint and a strike to the body; if the opponent does not react → I finish the attack with a strike to an open sector; if the opponent reacts with a counterattack → I retreat and launch a repeat attack.

Hagemann et al. [9] proved that experienced fencers outperform beginners precisely in their ability to make advance predictions based on visual patterns of the opponent's behaviour. The 'if-then' method trains this ability ideomotorically, forming neural connections between sensory input (visual assessment of the opponent's actions) and motor output (own action).

c) Independent choice and verbal commitment of the athlete to take action. In sabre fencing, most attacks and counterattacks (responses) are deliberate. At the same time, the choice and timing of subsequent tactical intentions to initiate their application in extreme combat situations are complicated due to: spatial and temporal uncertainty when choosing an offensive or defensive combat model; the need to assess the situation and control the athlete's attention (mental distraction) on the opponent's subsequent actions; maintaining a safe distance and other tactical factors [1-3]. To do this, in an individual lesson, the athlete announces their intention to attack with a batman and a feint strike to the inner sector. The coach builds an adequate countermeasure: for example, imitates a parade or counterattack. The athlete completes the attack while maintaining the initial decision, despite the changing situation. The coach gradually complicates the task and begins to vary the reaction (sometimes performing a defence, sometimes not reacting), forcing the athlete to adjust their actions without changing the decision to attack.

d) Anticipating the distance and momentary characteristics of weapon interactions when penetrating the zone of presumed defence – overcoming the opponent's defensive barrier to avoid collisions of blades in attacks and responses by imagining their movements is a necessary component of preparation for the application of actions in sabre combat [1-3].

The ideomotor training method is implemented as follows: with their eyes closed, the athlete imagines their position 'on the track' with the opponent 2-2.5 metres in front of them. Mental execution of the chosen attack – the beginning of the lunge → the feeling of entering the attack zone → anticipating the opponent's reaction (retreat? defence? counterattack?) → adjustment of the trajectory of the strike. Kinesthetic sensations are activated: tension of the quadriceps muscle, push with the foot, weight transfer, contact with the weapon.

Data from Hagemann et al. [9] show that elite fencers use their opponent's micro-movements (2-5 cm changes in posture) as predictors of their actions. Ideomotor training allows these patterns to be 'recorded' in long-term memory without hours of sparring.

Conclusions. Complicating ideomotor representations promotes the development of cognitive flexibility, operational thinking, and creative tactical behaviour in sabre fencers through four interrelated methods: a) preliminary modelling of the probable sequence of actions in a single bout; b) modelling a probabilistic sequence of actions through an 'if-then' system; c) independent choice and verbal commitment of the athlete to take action; d) anticipating the distance and momentary characteristics of weapon interactions. Practical implementation involves including ideomotor training (10-15 minutes) 3-5 times a week with mandatory video analysis to monitor the accuracy of representations.

The integration of these methods with modern neuroscience data [7, 8, 11] and the results of specialised research in fencing [4, 9] confirms the validity of the Russian concept of technical and tactical improvement and opens up prospects for the further development of personalised ideomotor training programmes for highly skilled sabre fencers.

References

1. Ryzhkova L.G. Funktsionalnye sostavlyayushchie boevyh deystviy. Fekhtovanie XXI vek.

Tekhnika. Taktika. Psihologiya. Upravlenie trenirovkoy. Sost. i obshch. red. D.A. Tyshler. Moscow, 2013. Pp. 28-32.
2. Tyshler D.A., Ryzhkova L.G. Fekhtovanie. Tekhniko-takticheskaya i funktsionalnaya trenirovka. Moskva: Akademicheskiy proekt, 2010. 183 p.
3. Fekhtovanie. XXI vek. Tekhnika. Taktika. Psihologiya. Upravlenie trenirovkoy. sost. i obshch. red. D.A. Tyshler. Moskva: Chelovek, 2014. 232 p.
4. Borysiuk Z., Waskiewicz Z. Information Processes, Stimulation and Perceptual Training in Fencing. Journal of Human Kinetics. 2008. No. 19. Pp. 63-82. DOI: 10.2478/v10078-008-0005-y.
5. Decety J., Jeannerod M. Mentally simulated movements in virtual reality: Does Fitts's law hold in motor imagery? Behavioural Brain Research. 1995. V. 72(1-2). Pp. 127-134. DOI: 10.1016/0166-4328(96)00141-6.
6. Driskell J.E., Copper C., Moran A. Does mental practice enhance performance? Journal of Applied Psychology. 1994. V. 79(4). Pp. 481-492. DOI: 10.1037/0021-9010.79.4.481.
7. Guillot A., Collet C. Contribution from neurophysiological and psychological methods to the study of motor imagery. Brain Research Reviews. 2005. V. 50(2). Pp. 387-397. DOI: 10.1016/j.brainresrev.2005.09.004.
8. Guillot A., Collet C. Construction of the Motor Imagery Integrative Model in Sport: a review and theoretical investigation of motor imagery use. International Review of Sport and Exercise Psychology. 2008. Vol. 1(1). Pp. 31-44. DOI: 10.1080/17509840701823139.
9. Hagemann N., Schorer J., Ca al-Bruland R., Lotz S. et al. Visual perception in fencing: Do the eye movements of fencers represent their information pickup? Attention, Perception, & Psychophysics. 2010. V. 72(8). Pp. 2204-2214. DOI: 10.3758/BF03196695.
10. Holmes P.S., Collins D.J. The PETTLEP approach to motor imagery: A functional equivalence model for sport psychologists. Journal of Applied Sport Psychology. 2001. V. 13(1). Pp. 60-83. DOI: 10.1080/10413200109339004.
11. Kosslyn S.M., Ganis G., Thompson W.L. Neural foundations of imagery. Nature Reviews Neuroscience. 2001. V. 2(9). Pp. 635-642. DOI: 10.1038/35090055.
12. Toth A.J., McNeill E., Hayes K., Moran A.P., Campbell M. Does mental practice still enhance performance? A 24 year follow-up and meta-analytic replication and extension. Psychology of Sport and Exercise. 2020. V. 48. Pp. 101672. DOI: 10.1016/j.psychsport.2020.101672.

Methodology for individualizing the technical and tactical training of qualified karatekas, taking into account the styles of fighting

UDC 796

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Abstract

Objective of the study is to theoretically substantiate the content and direction of the methodology for individualizing the technical and tactical training of qualified karatekas, taking into account the styles of fighting.

Methods and structure of the study. To achieve this goal, the following research methods were used: theoretical analysis and generalization of scientific and methodological literature; pedagogical observation; video analysis of competitive activities; pedagogical experiment; mathematical and statistical methods. The study was conducted on the basis of the «Sports School» of the Alkeevsky district of the Republic of Tatarstan. The experiment involved 11 athletes involved in Kyokushin (Master of Sport qualifications – 2 people, Candidate of the Master of Sports - 9 people) (weight category 65-75 kg).

Results and conclusions. The content and direction of the methodology for individualizing the technical and tactical training of qualified karatekas, taking into account the styles of fighting, have been developed. The content of the technical and tactical training methodology includes two sections: (1) Improvement of the individual style of conducting a competitive duel; (2) elimination of gaps in technical and tactical actions in duels.

The content and direction of the technical and tactical training methodology was carried out individually for each karateka, taking into account the arsenal of technical and tactical actions, preferred tactics of fighting, the content and structure of competitive activity, the number of signature techniques brought to perfection, the level of motivation to achieve the highest results, the ability to rebuild tactics fighting depending on the current situation.

Keywords: *content of the methodology, technical and tactical training, qualified karatekas, style of fighting.*

Introduction. The rapid development of karate in recent decades, as well as its growing popularity around the world, has consistently stimulated scientific research by specialists in the field. In recent years, there has been a significant increase in the number of publications devoted to optimizing the sports training of karatekas. New approaches to teaching and training methods are being actively explored, and classifications of various techniques in Kyokushin karate are being developed. In particular, the fighting technique (kumite) stands out, which in turn is divided into predetermined and free fights, as well as sports and traditional formats [2, 6].

The study of the effectiveness of the use of technical actions in fights is carried out with an emphasis on the relationship between these actions and the level of speed and strength qualities of athletes. Results are increasingly being published that illustrate the positive impact of computer technology and specialized simulators on the training process. Research is also being conducted based on a synergistic approach to organizing classes for qualified karatekas [1, 3, 4].

As for martial arts, an athlete's fighting style is determined by his dominant physical qualities. For example, an athlete who is highly powerful is classified as a «enforcer», whereas an athlete who excels in endurance is considered to be a «tempovikom». The ability to technically and tactically maneuver highlights «the player». These characteristics are undoubtedly generally accepted in martial arts, but each direction can add its own specific elements depending on the characteristics of competitive practice.

Recent research conducted in the field of karate has identified three key fighting styles for Kyokushin athletes: striking offense, combined offense, and provocative maneuvering. A strike attack implies a constant desire of fighters to take control of the tactical initiative, while they actively work from a distance. Each athlete strives to complete their series and combinations of punches by knocking out the opponent, which involves active interaction at medium and short distances, while long-range punches are used much less frequently [3, 6].

The combinational manner is characterized by an abundance of false attacks and threats, which serve as the basis for deceptive maneuvers. Athletes strive to create a need for the enemy to switch his reactions and actions, changing the pace and sector of his attacks. Provocative maneuvering includes giving the enemy the opportunity to act in unfavorable conditions for him, as well as actively using a variety of actions without switching to directly attacking actions [3, 6].

However, when analyzing existing literary sources, it becomes obvious that the problems of individualizing the training of karatekas, taking into account the characteristic features of different styles of fighting, are not sufficiently covered. As a result, important tools for improving the quality of sports training, such as individualization, prediction and control, are used with low efficiency. Experts emphasize the need for in-depth scientific research research aimed at developing theoretical foundations, searching for innovative forms of organization and effective methods of managing the training process of karatekas, which is the cornerstone for the further development of karate [2, 5].

The relevance of our research is due to the presence of an objective contradiction between the leading role of technical and tactical training of qualified karatekas in competitive activities, on the one hand, and the need for scientific substantiation of the methodology for technical and tactical training of qualified karatekas, taking into account the styles of fighting.

Objective of the study is to theoretically substantiate the content and direction of the methodology for individualizing the technical and tactical training of qualified karatekas, taking into account the styles of fighting.

Methods and structure of the study. To achieve this goal, the following research methods were used: theoretical analysis and generalization of scientific and methodological literature; pedagogical observation; video analysis of competitive activities; pedagogical experiment; mathematical and statistical methods. The study was conducted on the basis of the «Sports School» of the Alkeevsky district of the Republic of Tatarstan. The experiment involved 11 athletes involved in Kyokushin (Master of Sport qualifications – 2 people, Candidate of the Master of Sports - 9 people) (weight category 65-75 kg).

Results of the study and discussion. The structure and content of the technical and tactical training methodology we have developed includes two sections: (1) improvement of the individual style of conducting a competitive match; (2) elimination of gaps in technical and tactical actions in fights.

The preparatory period consists of two stages: general preparatory and special preparatory. The bulk of the training work was built within the framework of weekly microcycles, where classes were held six times a week, and Sunday was reserved for proper rest.

Retracting stage. At this time, athletes underwent 20 hours of training with equal division into general and special physical training. The general preparatory stage, in turn, was strengthened by the tasks of increasing functionality by integrating physical training with technical and tactical skills, which amounted to

Table 1. Periodization model for game style karatekas

Periodization	August	September	October	November	Dec	January
	Preparatory I I			Sorev-y I I	Podg II	
Mesocycles	By pulling in	Basic	Pre-ripening	Sorev	Vos.	Basic
Stage	2 AA	11 MS, M; ST.	4 Under M, SV; Conv.SMV	4 Under.SMV	2 AA	4 MS, M

Periodization	February	March	April	May	June	July
	Preparatory II	Competitive II			Transitional	
Mesocycles	Basic	Pre-ripening		Sorev		
Stage	7 MS, M; ST	4 Under M, SV; Conv. SMV		4 Under.SMV		

*Conventions: AA-anatomical adaptation; MS-maximum strength; M-power; Conv-conversion; SMV-medium-term muscle endurance; SV-strength endurance; Sub-maintenance; numbers – number of weeks.

Table 2. Approximate microcycle directional content (in the base mesocycle) of game style karatekas

Day of the week	Type of activity	Contents of the lesson	
Monday	Technical-tactical	*Pear work 4 rounds of 2 minutes:* • Practice power punching on a bag from different positions. («Shito Tsuki», «Oh Tsuki», «Gyaku Tsuki», «Hizo Giri», «Mae Giri», «Mawashi Giri», «Ushiro Giri») *Practice combinations on a dummy for 3 rounds of 2 minutes:* • Entering the attack zone with a false blow, breaking the distance, entering the attack zone with a far hand blow, continuing the attack transferring the blow from the jedan (head) to the chudan (body), moving from the attack line, reaching a safe distance. • Entering the attack zone with a false blow near foot/arm, break of distance, far hand counterattack, getting to a safe distance. • Simulated entry into the near distance, break of distance, entering the attack zone far hand strike, displacement from the attack line, continuation of the attack - transfer of the blow from the chudan (body) to the dzedan (head), displacement from the attack line, reaching a safe distance.	
Tuesday	Special physical training	1. Barbell lunges (VSP) 2. Pull-ups (bas) 3. Bench dumbbell press (dietary) 4. Landmine press (osn) 5. Deadlift (ax) 6. Weighted toe lifts (VSP) 7. Back barbell squats (osn) 8. Romanian thrust (spr) 9. Arm flexion (Evs)	Load: 70-80% Number of units: 3-5 main, 2 auxiliary Number of repetitions per approach: 3-5 for basic exercises, 10-12 for VSP control. Number of approaches: 2 for vsp control, 3-5 for main control. Rest: 2-3 min
Wednesday	Technical-tactical	*Practice combinations with a partner (partner with a vest) 4 rounds of 2 minutes:* • Entering the attack zone with a false blow, breaking the distance, entering the attack zone with a far hand blow, continuing the attack transferring the blow from the jedan (head) to the chudan (body), moving from the attack line, reaching a safe distance. • Simulated entry into the near distance, break of distance, entering the attack zone far hand strike, displacement from the attack line, continuation of the attack - transfer of the blow from the chudan (body) to the dzedan (head), displacement from the attack line, reaching a safe distance. *Practice combinations with a partner (partner in a vest) in moving 3 rounds of 2 minutes:* • Simulated entry into the near distance, break of distance, entering the attack zone far hand strike, displacement from the attack line, continuation of the attack - transfer of the blow from the chudan (body) to the dzedan (head), displacement from the attack line, reaching a safe distance. • Entering the attack zone with a false blow near foot/arm, break of distance, far hand counterattack, getting to a safe distance.	
Thursday	Special physical training	1. Lunges with a barbell 2. Throws medball against the wall. 3. Bench press dumbbells 4. Press landmine 5. Mahi giray 6. Weighted toe lifts 7. Back barbell squats 8. Push-ups 9. Russian twisting with weights	Load: 40-50% Number of units: 5-7 Time under load: from 30 sec-1 min: Number of approaches: 2 series (circles), 2-4 approaches Rest break: 10 seconds between sets, 1-2 minutes between series.
Friday	Technical-tactical	TTD workout with partner (6 rounds of 2 minutes): • Simulating technical and tactical situations taking into account the style of fighting in sparring/competitive format, after each round there is a change of partner.	
Saturday	Special physical training	10. Barbell lunges (VSP) 11. Pull-ups (bas) 12. Bench dumbbell press (dietary) 13. Landmine press (osn) 14. Deadlift (ax) 15. Weighted toe lifts (VSP) 16. Back barbell squats (osn) 17. Romanian thrust (spr) 18. Arm flexion (Evs)	Load: 70-80% Number of units: 3-5 main, 2 auxiliary Number of repetitions per approach: 3-5 for basic exercises, 10-12 for VSP control. Number of approaches: 2 for vsp control, 3-5 for main control. Rest: 2-3 min
Sunday	Day off		

264 hours of training with a ratio of methods of 40% of total physical and 60% of special training.

The special preparatory stage concluded the training, focusing on the individual aspects of technical and tactical skill. As a result, it was designed for 192 hours, where the ratio of general and special physical training equipment was 30% to 70%. The development of the training content was carried out individually, taking into account the fighting style of each athlete, their preferences in tactics, as well as the level of motivation and ability to adapt to changes in the situation.

The training process of the control group used a traditional approach, which emphasizes the need for technical training of karatekas and generally accepted

methods of physical training. In this group, the main emphasis was on improving physical strength and technique in performing basic karate techniques, with a focused attention to elements of tactical training adapted to the individual characteristics of athletes.

The experimental group, in turn, provided a more diverse and focused approach. Each day of the week was scheduled in certain areas: Monday – improving punching techniques taking into account the style of fighting, Tuesday – improving kicking techniques taking into account the style of fighting, Wednesday – maneuverable actions (improving technical and tactical actions in pairs), Thursday – technical and tactical preparation taking into account style fighting a fight, Friday – improving technical and tactical actions in conditions of competitive sparring, and Saturday – analysis of the results of competitive fights. Thus, Sunday remained a time for recovery.

During the preparatory period, an experimental technique was introduced to increase the level of technical and tactical preparedness of qualified athletes. The general training period lasted 20 weeks, consisting of two parts: 8 weeks of general training and 12 weeks focused on special training. At the general preparatory stage, the ratio of special and technical-tactical training equipment was set at 40% to 60%, which made it possible to allocate 20 minutes for personal tasks at each training session. As a result, at this stage 48 technical and tactical training sessions were conducted, which amounted to 72 hours of work.

At the special preparatory stage, which lasted 12 weeks, the ratio of physical and technical training changed by 20% of special and 80% of technical and tactical training. As before, each workout contained 20 minutes for individual tasks, but now the number of workouts has increased to 96, which provided 144 hours of active work to improve this aspect. This comprehensive approach to the training process allows athletes to significantly improve their skills and achieve higher results in competitions.

Table 1 presents an example of the periodization model we developed for karatekas of the game style of fighting.

Table 2 presents the approximate content, taking into account the microcycles' directionality (in the basic mesocycle) of the game style karatekas.

For each athlete, taking into account the style of fighting individual technical and tactical training tasks were developed, taking into account the characteristics of technical and tactical actions.

Conclusions. Thus, the content and direction of the technical and tactical training methodology was carried out individually for each karateka, taking into account the arsenal of technical and tactical actions, preferred tactics of fighting, the content and structure of competitive activity, the number of signature techniques brought to perfection, the level of motivation to achieve the highest results, the ability to rebuild fight tactics depending on the current situation.

References

1. Alkhasov D.S. Individualization of technical and tactical training of high-class athletes in traditional and oriental types of martial arts. Innovative technologies in sports and physical education: Materials of the V interregional scientific and practical conference with international participation, Moscow, April 18–19, 2016. Moscow: LLC «Center for Social Forecasting and Marketing», 2016. Pp. 25-31. URL: https://elibrary.ru/item.asp?id=26133340
2. Bakirova I.C., Zhukov S.N., Podlivaev B.A. Assessment of technical and tactical indicators of competitive activity for men and women in sports karate. Bulletin of sports science. 2017. No. 2. Pp. 9-13. URL: https://elibrary.ru/item.asp?id=29656732
3. Baraev Kh.A., Dzhamalov D.D., Kondratenko S.A., Bekmukhambetov B.S. Technology of individualization of the training process of highly qualified boxers. Current scientific research in the modern world. 2019. No. 4-3(48). Pp. 105. URL: https://www.elibrary.ru/item.asp?id=37421683
4. Baranov M.V. Characteristics of effectiveness individualized technical and tactical training of karate-do athletes, taking into account fighting styles. Slobozhansky Scientific and Sports Bulletin. 2011. No. 2(26). Pp. 98-101. URL: https://elibrary.ru/item.asp?id=21086371
5. Bely K.V., Epov O.G. Analysis of the quantitative characteristics of fights of highly qualified athletes in Kyokushin. Science and sports: current trends. – 2018. V. 18. No. 1(18). Pp. 14-20. URL: https://elibrary.ru/item.asp?id=35666645
6. Bely K.V., Epov O.G. The influence of maneuvering on the effectiveness of technical and tactical actions in Kyokushin. Extreme human activity. 2018. No. 2(48). Pp. 83-86. URL: https://elibrary.ru/item.asp?id=35666645

The use of digitalization elements in teaching snowboarding to older preschool children

UDC 796 011

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Abstract

The article discusses the results of experimental work on the development and testing of a methodology for teaching older preschool children to snowboard using elements of digitalisation.

Objective of the study is to develop and test a methodology for teaching snowboarding to older preschool children using digitalization elements.

Methods and structure of the study. During the first lesson, the instructor showed children videos of adult and children's competitions, a film demonstrating all technical elements, runs, and various riding styles, and presented information about snowboarding and its history using visual aids.

Keywords: *snowboarding, older preschool children, snowboarding teaching methodology, age-related characteristics of 5–7-year-old children, digitalization in sports.*

Introduction. The Concept for the Development of Physical Culture and Sports in the Russian Federation until 2030 aims to create conditions for involving all age groups in regular sports activities. A special focus is placed on increasing the proportion of children aged 3 and older who regularly engage in physical culture and sports.

The climatic conditions and infrastructure of the Perm Krai provide unique opportunities for snowboarding, allowing the use of a range of natural health-promoting factors. Snowboarding is a winter activity that is rapidly gaining popularity. Many parents who snowboard themselves wish to teach their children this skill from an early age. Such joint activities strengthen parent-child relationships and have a positive impact on the preschooler's health.

In the 2020-2021 academic year, we developed and tested a methodology for teaching snowboarding to children aged 5–7. Data collected over a three-year experiment confirm the feasibility, effectiveness, and appropriateness of teaching older preschool children to snowboard using the developed methodology. The methodology was tested with both neurotypical children and children with special health needs, including those diagnosed with mental development delays.

Over subsequent years, the methodology was refined and improved. To enhance clarity, accessibility, and to maintain children's interest and motivation, digitalization elements were incorporated into the methodology.

Objective of the study is to develop and test a methodology for teaching snowboarding to older preschool children using digitalization elements.

Methods and structure of the study. During the first lesson, the instructor showed children videos of adult and children's competitions, a film demonstrating all technical elements, runs, and various riding styles, and presented information about snowboarding and its history using visual aids.

Slope activities require a certain level of responsibility for both oneself and others. Understanding the importance of safety rules on the slope and concern for one's own health and that of fellow riders is an essential aspect of starting lessons. For older preschool children, mastering this material can be challenging. Therefore, three short animated films were cre-

ated in which forest characters (wolf, fox, bear, rabbit) explained and demonstrated proper behavior on the slope, potential hazards, rules for using lifts, and how to handle a snowboard and sports equipment. These animations were shown during the first three introductory lessons. Later, the material was discussed with the children, creating strong associative imagery and reinforcing necessary knowledge. Instruction was delivered in a playful and relaxed manner, fostering a positive attitude towards further lessons. If needed, children could rewatch the animations to consolidate their knowledge.

After learning the basic technical elements, children created two animated films themselves using a cartoon studio and snowboarder figurines to visualize and reinforce each technique. Before practice runs, interested children could watch the animations to strengthen their understanding. Animation creation took place within the parent-child community after training sessions. The resulting materials remained accessible to children and parents throughout the entire learning process.

According to the developed methodology, the instructor continuously observes the child on the slope, occasionally using video recording (the instructor films the student performing an exercise or running down the slope). Video recordings were used to evaluate the performance of riding elements together with the student. Video recording helps students visually see how they perform exercises and where they make mistakes. Using video materials improves analysis quality, accelerates error correction, allows children to observe their actions from an outside perspective, and enables parents to assess their child's progress or identify challenges. During training, 10–12 two- to three-minute videos were recorded for each group member (7 for test assignments, the rest for particularly challenging elements and runs). Each child also received a final run video showcasing their achievements in mastering the snowboard.

For the preliminary and main stages of teaching children snowboarding, video lessons were developed and recorded to prepare and help older preschool children master the snowboard according to the methodology. Twelve video lessons were created, one for each scheduled session. Each video lesson begins with a greeting and an explanation of the lesson's focus. It then includes exercises to warm up major muscle groups, followed by stretching exercises. Next, the element is demonstrated in its entirety from multiple angles, then broken down into constituent parts from various perspectives. All demonstrations are accompanied by explanations of the exercise, performance specifics, potential difficulties, and key points to pay attention to. At the end of the lesson, the exercise or run is shown again in full, at the actual speed used during riding.

Results of the study and discussion. Video lessons allowed children with weaker physical fitness to practice at home under parental supervision, either independently or via online connection with the instructor. Children who missed lessons for valid reasons or wished to practice beyond slope lessons with the instructor could also use these resources to train independently under adult supervision. Such home practice not only helps children learn and consolidate exercises but also positively affects their physical fitness, improves parent-child relationships, and boosts the child's confidence in the significance of their learning. Repeated viewing and practice of exercises from video lessons during the preparatory stage adds the effect of ideomotor training. Children actively imagine performing the skills, mentally rehearsing them, which facilitates actual mastery.

If parents cannot arrange snowboarding lessons with an instructor for their child, video lessons can be used for independent learning.

The developed video lessons for teaching older preschool children snowboarding can be used by instructors at ski resorts to effectively teach children considering their age-related, physiological, and psychological characteristics.

Three years of working with older preschool children within the framework of the developed methodology for teaching 5–7-year-olds snowboarding with additional use of media technologies has yielded stable positive results: 100 % of children are satisfied with the learning process, their expectations have been met, and the results are satisfactory. The learning experience was comfortable for them, did not cause negative emotions or significant difficulties. All children wish to continue learning, mastering more complex elements or riding techniques. A system of interaction with parents has been established, where the parent is an active participant in the child's learning process, invested in the child's success and further progress in this sport.

Learning according to the developed methodology helps preschool children quickly and effectively master initial snowboarding elements while maintaining a

lively interest in sports and a desire for further development and improvement.

Conclusions. Snowboarding is a rapidly developing sport and recreational activity that positively impacts a child's psychological and physical well-being. Proper organization of snowboarding lessons will contribute to its further popularization and reduce negative consequences and injuries.

Children who become acquainted with snowboarding at a preschool age have a greater chance of forming sustainable habits related to a healthy lifestyle. They learn not only riding techniques but also healthy eating habits and body care, which are important for successful sports participation. Physical activities in fresh air foster children's love for nature and motivate them to spend time outdoors, increasing overall physical activity.

Using media technologies in the methodology for teaching older preschool children snowboarding helps maintain children's interest and motivation throughout the learning process, enhances effectiveness through visualization and opportunities for independent study, and improves training process analysis and individualized assessment.

The obtained results can be applied in the practical activities of sports schools, Olympic reserve schools, and institutions of additional children's education; in preschool institutions within core and additional education programs; and in developing educational and methodological materials for coaches in various sports.

References

1. Klochkova M. A. Snowboard: First Steps. L.: Nauka, 2009. Pp. 5-7.
2. Matveev L. P. Theory and Methodology of Physical Culture. Moskva, 1991. 121 p.
3. Salmanov G. D. Lessons in Alpine Skiing and Snowboarding. Moskva: Akademiya, 2004. Pp. 49-53.
4. Semenova T. A. Features of Motor Skill Formation in Preschoolers. Moskva, 2014. Pp. 105-111.
5. Semenova T. A. «Technology of Step-by-Step Physical Exercise Training for Preschool Children». Modern Problems of Science and Education, M., 2014. No. 6. Pp. 31-32.
6. Forman W. Comprehensive Review of Skiing and Snowboarding, 2017. 53 p.
7. Longo A. «SNOWBOARDER VOLUME 31». Snowboarding Days, 2016. No. 9. Pp. 43.

Organizational and marketing prerequisites for the effective conduct of student competitions: the case of boxing

UDC 796

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Abstract

Objective of the study is to identify ways to improve the organization of student sports events from the perspective of sports marketing.

Methods and structure of the study. We analyzed the experience of organizing and conducting a Boxing show according to the rules of the World Series of Boxing (WSB), dedicated to World AIDS Day, titled "Live Boxing," at the Volga State University of Physical Culture, Sports, and Tourism. We also conducted surveys to identify factors influencing attendance at student sports events and to assess the success of the "Live Boxing" sports event. The first survey involved 120 respondents, and the second involved 186 people.

Results and conclusions. The organization and conduct of the WSB Boxing show, dedicated to World AIDS Day and titled "Live Boxing," involved four stages:

- Stage 1: Development of the project proposal (initial situation, project goal, project objectives, risks, budget).
- Stage 2: Marketing of the WSB Boxing show (personal marketing, place marketing, organization marketing, idea marketing).
- Stage 3: Development of the Boxing show script.
- Stage 4: Conducting the Boxing show.

The ways to improve marketing activities for attracting fans and spectators to student sports events include: show organization; comfort and safety; unconventional advertising; and opportune timing.

Keywords: *Organizational prerequisites, marketing prerequisites, student competitions, sports event "Live Boxing".*

Introduction. The transition of Russian sport to a market economy, the intensification of its commercialization and professionalization processes, a significant expansion of the international and a reduction of the domestic sports calendar in the 80s and 90s led to a transformation of the existing systems for conducting sports competitions in Russia and their target orientation [4, 5, 7].

Usually, when analyzing a competition system, researchers and specialists consider its following elements: principles of conducting competitions, admission to them, team composition, scoring, determining winners, and officiating. For many years, the entire system of elite sport in Russia was aimed exclusively at preparing national team members for their successful performance. Hardly anyone would argue that the entire system of organizing competitions, especially in team sports, was not focused on the spectator, but on fulfilling this task. To accommodate the national team, the calendar was interrupted, games were postponed, and, for the most part, took place in front of empty or half-empty stands. It should also be emphasized that enormous funds were spent in fulfilling this task. In the early 90s, leaders of Russian sport began to implement sports management and marketing, especially in the field of organizing sports competitions, as their number began to sharply decrease, and the costs of their conduct – to grow. During this period, the first

scientific works and publications on sports event management appeared in Russia (S.I. Guskov, V.V. Kuzin, M.E. Kutepov, I.I. Pereverzin, etc.). But, unfortunately, these works practically touched little upon the issues of management and marketing of sports competitions, which create the spectacle (product) for sale to consumers – spectators. In this regard, it should be noted that already in the late 80s, many Soviet scientists concluded that sport, even under the conditions of the former USSR, was a commodity. And such a commodity is, first and foremost, sports competitions [1].

Sports marketing has been around for about 30 years, but in Russia, according to experts, it has existed for 13–15 years, since professional sports clubs became fully independent. In reality, the domestic school of marketers in this management sphere is only just beginning to form. Sports marketing is a specific application of marketing principles and processes to sports products, as well as the promotion of any other goods through cooperation with sports [2, 6]. It is important to distinguish "sports marketing" from "marketing in sports," which refers to the adaptation of already known and proven marketing tools from other fields. Professionals agree that traditional marketing methods applied to the sports sector have extremely low effectiveness, which is why today this area can be considered an independent practical discipline. The development of individual professional sports in Russia as a sphere of sports and entertainment business necessitates a marketing approach to organizing and conducting competitions, primarily focused on spectacle and revenue generation.

Attracting fans and spectators to student sports events is an important factor in increasing young people's interest in physical culture and sports [3].

As a theoretical basis for the study, the works and textbooks of researchers such as O.N. Stepanova "Marketing in Physical Culture and Sports Activities," V.V. Galkin "Economics and Management of Physical Culture and Sports," V.I. Zholdak "History of Management, Sports, and Tourism," V.N. Zuev "Management of the Sports Competition System," and I.I. Pereverzin "Management of a Sports Organization" were used.

The relevance of the study is due to the existence of a contradiction, on the one hand, between the significance of student sports events for organizing student leisure and increasing youth interest in sports, and on the other hand, the passivity of student youth in attending student sports events as fans and spectators.

Objective of the study is to identify ways to improve the organization of student sports events from the perspective of sports marketing.

Methods and structure of the study. We analyzed the experience of organizing and conducting a Boxing show according to the rules of the World Series of Boxing (WSB), dedicated to World AIDS Day, titled "Live Boxing," at the Volga State University of Physical Culture, Sports, and Tourism. We also conducted surveys to identify factors influencing attendance at student sports events and to assess the success of the "Live Boxing" sports event. The first survey involved 120 respondents, and the second involved 186 people.

Results of the study and discussion. The experience of organizing and conducting a Boxing Show according to the rules of the World Series WSB, dedicated to World AIDS Day, "Live Boxing," at the Volga State University of Physical Culture, Sport and Tourism (VSUPCST) has been analyzed.

The organization of the sports event included a series of stages:

Stage 1: Development of the Project Proposal.

Project Proposal: "Boxing Show according to the rules of the World Series WSB, dedicated to World AIDS Day, 'Live Boxing'."

Initial Situation: Such a student sports event had never been held at VSUPCST before.

Project Goals: To popularize boxing among student youth; to draw attention to the problem of combating AIDS; for student managers to gain experience in organizing and conducting large-scale sports events.

Risk Analysis: Rental, transportation, and installation of the boxing ring; ensuring the comfort of fans and spectators; coordination of the work of university services involved in event organization; attracting sponsors.

Stage 2. Marketing of the Boxing Show according to the rules of the World Series WSB, dedicated to World AIDS Day, "Live Boxing," included:

- Personal Marketing: The Rector of VSUPCST and the event sponsor.
- Place Marketing: VIP seating for honored guests.
- Organization Marketing: Positioning of VSUPCST and promotion of the university's sports image.
- Idea Marketing: The social significance of the project: dedicated to World AIDS Day; production of athlete equipment and a unique winner's belt.

Stage 3. Development of the Scenario for the Boxing Show according to the rules of the World Series

WSB, dedicated to World AIDS Day, "Live Boxing."

Stage 4. Conducting the Boxing Show according to the rules of the World Series WSB, dedicated to World AIDS Day, "Live Boxing":

- Decoration of the venue (ULK sports hall).
- Weigh-in of athletes.
- Accommodation of guests in the DU residential cluster.
- Support from medical personnel during the show.
- Reception and seating of VIP guests.
- Results of the "Live Boxing" show with coverage on social media pages and in the media.

To identify factors influencing attendance at student sports events, we conducted a survey both before and after the event. The first survey involved 120 respondents. The majority of respondents were aged between 21 and 30 years old. Among the respondents, 66.6% were students, 16.7% were faculty members, and 16.7% were university staff.

When asked, "Are you aware that the University will be hosting a boxing night called 'Live Boxing'?", 83.3% of respondents answered affirmatively, while 16.7% had not heard about the event. More than half of those surveyed (54.2%) planned to attend the 'Live Boxing' sports event. Half of the respondents planned to attend if they had time (41.7%), and only 5 people (4.1%) stated that they were not interested.

Most of the respondents are waiting for an exciting show (56.7%), 50/50 of the respondents are waiting for exciting fights and want to have fun with friends, a minority wants to learn from the experience of organizing events of this level.

To the question: "What reasons can force you to refuse to attend this event?" the majority of respondents (69.2%) answered that the inconvenient time of the event also worries the audience about the comfortable seating. The presence of VIP guests at the event is absolutely insignificant for the respondents.

Thus, the analysis of the answers of the respondents when organizing the Boxing Live sporting event is necessary:

1. take into account the contingent of spectators - young people under 30 years old, mainly students.
2. strengthen the advertising campaign.
3. disseminate information about the event through students.
4. Organize an interesting show with exciting fights.
5. Choose a convenient time for the event, after the end of classes and at the end of the working day.
6. Organize a comfortable seating of the audience.

In order to assess the success of the Boxing Live sporting event after the event, we conducted a survey with the participation of 186 respondents. By the number of seats occupied in the hall, we assume that at least 450 spectators were present at the event.

Most of the spectators who came to the competition are under the age of 20, i.e. sporting events are interesting specifically for the student audience.

When answering the question: "Do you feel a sense of pride that an event of this scale is being held at the University?" on a five-point scale, all respondents answered that they feel a sense of pride. Thus, the holding of such events is an image for the university and forms students' affiliation with the University - a corporate spirit.

Most of the respondents came to the event to watch the competition, as they are active boxing fans and watch the show.

After attending Boxing Evening, 88, 2% (164 people) had a desire to attend the boxing section at the University, both boys and girls. Most of the respondents (89.8%) would come to such an event for the second time. To the question: "Does the holding of such events contribute to the popularization of the sport?" 100% of respondents answered in the affirmative and were satisfied with the conditions created for the event.

Thus, the analysis of the survey results after the "Boxing Live" event allows us to draw the following conclusions:

- Students, both boys and girls, are mostly interested in this event;
- Most come to watch the events, both as a spectator and as a fan with an interest in boxing;
- Holding such events contributes to the popularization of the sport, and also causes a sense of pride in the university;
- The organizers created comfortable conditions for the audience, which contributed to the desire to re-attend such an event.

The analysis of respondents' responses to the questionnaire conducted after the Boxing Live event allowed us to identify ways to improve marketing activities to attract fans and spectators to the student sports event.

Marketing of the preparation and holding of a physical culture or sports event includes a set of the following 4 areas of marketing activity allocated by us (Fig. 1).

The show includes: search and work with sponsors, organization of a cultural program, questions of partici-

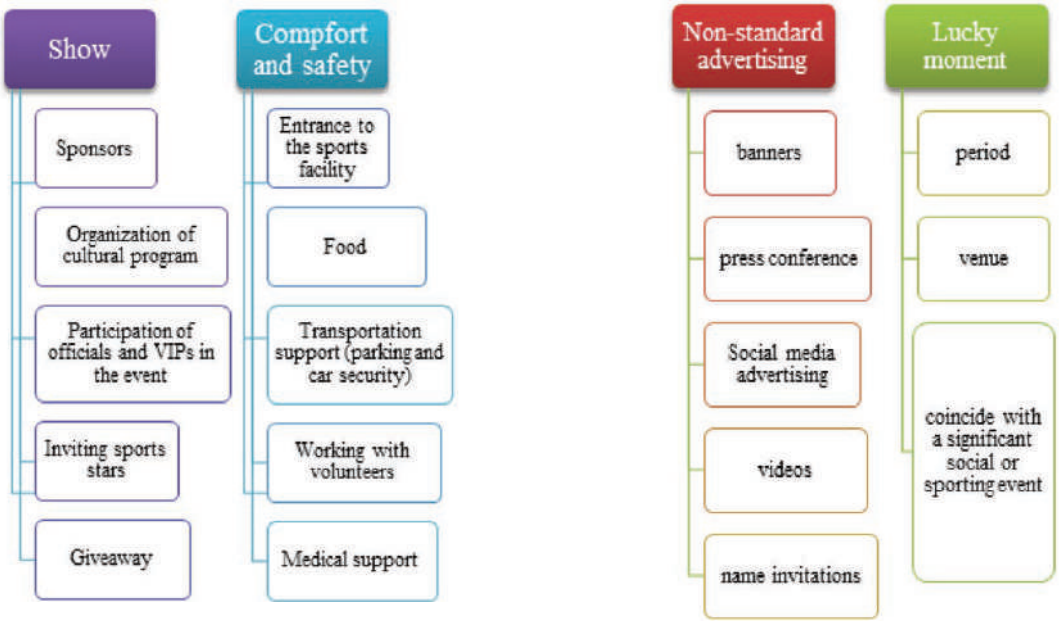

Fig. 1 - Ways to improve marketing activities to attract fans and spectators to a student sports event

pation in the event of officials and the invitation of VIPs play a big role. A large role in the marketing of physical culture and sports events is given to the invitation of famous athletes to them. Sports stars cheer up fans, spectators and give the events an attraction. In addition, participation in the event of idols athletes attracts additional media attention, as well as businessmen - potential sponsors of the event. We also offer a draw of small gifts with the symbols of the event (key rings, calendars, pens, a subscription to visit the boxing section).

Comfort and safety includes: organization of entrance to the facility, organization of meals and other related services, organization of transport support (travel, parking and car security), selection and work with volunteers, medical support.

Non-standard advertising includes an advertising campaign and public relations (PR) allows you to form public opinion. We offer the following forms of advertising: press conference (and advertising and PR), colorful banners, advertising from social networks, promotional videos, personalized invitations.

A good moment includes: determining the place and timing of the event (it is advisable not to change the dates so that the audience can plan in advance to attend this event); the time of the event should take into account the mode of study of students and the work of the administration, teachers and university staff. Following the example of our "boxing evening" next year plans to hold this event in the concert hall of the University. To coincide with an event of some socially significant event, for example, "Boxing Live" was dedicated to World AIDS Day.

Conclusions. Thus, the dominant principle of marketing sporting events is to focus on effectively meeting the needs and solving the problems of specific target groups of consumers (student youth). The main character is fans and spectators, and the organizers should maximally help them get the appropriate service - a high-class sports spectacle, to maintain and stimulate spectator interest, popularize the sport.

References

1. Aaker D. Building strong brands. Moscow: Grebennikov Publishing House, 2008. 440 p.
2. Alexandrov Yu.L., Tereshchenko N.N. The economics of commodity circulation: a textbook in 2 hours. Krasnoyar. State. Trade-Economy. in-t. – Krasnoyarsk, 2007. 277 p.
3. Belousov L.S., Kudryavtsev V.V. Research in sports management. Moscow: PLANETA, 2016. 240 p.
4. Beach D., Chadwick S. Sports Marketing. Moscow: Alpina Publishers, 2013. 708 p.
5. Zolotov M.I., Kuzin V.V., Kutepov M.E. Board book of a sports manager. Moscow: Reference manual «Physical education, education and science», 2012. 540 p.
6. Meleshina K. Food promotion. Use of sports events to promote the brand. 2010. No. 2. URL: http://www.oborud.info.
7. Dushkin M.R. PR and marketing promotion. Communications and impact, technology and psychology: textbook. Peter, 2010. 560 p.

Features of the formation of motivation for physical education classes among schoolchildren

UDC 796.011.1

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Abstract

Objective of the study is to identify the main features of the formation of motivation among secondary school students to engage in regular physical education classes.

Methods and structure of the study. A questionnaire survey was conducted among secondary school children in the Belgorod Oblast. An excerpt from the study is presented using the example of grades 5-8 (n=320). The results after initial processing are given as percentages.

Results and conclusions. Data has been obtained on negative and positive trends, factors influencing the motivation of secondary school students to participate regularly in physical education, and factors determining its specificity. The physical education motivation of schoolchildren is characterised in terms of its internal and external components. The dominant positive motivation of students to participate in physical education is confirmed by their high regularity of attendance at physical education classes and sports clubs outside of school, their positive attitude towards teachers, coaches and their pedagogical efforts, and the support of parents for the physical and sports activities of schoolchildren. The negative side of children's motivation is expressed in an insufficient understanding of the personal and social significance of physical education, a lack of independent activity among schoolchildren in learning about the values of physical education, and the absence of physical education in students' plans for their future lives.

Keywords: *: schoolchildren, secondary school, physical education, motivation building, physical education activities.*

Introduction. Motivating children and young students to participate in physical education has become a topical research issue both in Russia and abroad [3, 4]. This is because without motivation, conscious, purposeful and effective human activity is impossible [1, 2]. Particular importance is attached to the formation of sustainable motivation for physical education among school-age children [3, 4]. Interest in the formation of motivation for physical education and sports activities in middle school-aged children is due to the period of puberty and the numerous changes that occur in adolescents at this time [3].

Objective of the study is to identify the main features of the formation of motivation among secondary school students to engage in regular physical education classes.

Methods and structure of the study. The research was conducted in 2025 in the Belgorod Oblast. It involved students and teachers from Belgorod State National Research University, the North-West Institute of Management (a branch of the Russian Presidential Academy of National Economy and Public Administration), school teachers, and secondary school students (grades 5-8) from the Belgorod Oblast. The work presents data from a fragment of the study based on a survey of 320 secondary school students. The survey involved students from the main and preparatory medical groups. It used an electronic version of the questionnaire for students to identify their motivation for physical education classes, based on data from Yu.S. Molchanova [3]. In accordance with the objective of the study fragment, the analysis of the results was aimed at identifying the positive and negative aspects of schoolchildren's motivation to engage in physical education, which determine its specificity. The results after initial processing are presented as percentages.

Results of the study and discussion. As is well known, 'motivation' is the driving force behind human activity. It is based on human needs [1, 2]. This should be considered in terms of development and movement in order to understand the mechanism of their action. Needs can remain in a 'starting' state for a long time. In order for them to begin to be realised, a motive for action (its driving force) is necessary. There can be a large number of options for the emergence of motives. The beginning of the active phase of motivation should be expected when the most pressing needs coincide with motives and corresponding conditions.

It was assumed that before launching this process, it was necessary to study the most important features of physical education motivation, trends, and leading factors that have a significant impact on it. A questionnaire was used to assess the factors influencing students' physical education motivation, their current attitude towards physical education and their teacher, their personal attitude towards physical education classes, their desire to continue physical education activities in the future, their emotional perception of physical education classes, its inclusion in the daily routine, as well as actual actions confirming these factors, expressed, for example, in the regularity of class attendance, the assessment of teachers' activities, the time allocated to physical education classes as indicated by respondents, and information characterising the internal and external motivation of students to participate in physical education classes.

Analysis of the data obtained showed that, in general, the state of physical education and sports motivation among secondary school-age students, based on the sample of children in the Belgorod Oblast, can be assessed positively. Of those surveyed, 75% try to attend physical education classes regularly and attend classes almost without fail. However, physical education teachers note that children are sometimes forced to miss physical education classes due to the unstable situation in the region caused by the ongoing SVO and the corresponding concern of parents for their children. In this regard, it can be assumed that some time ago, the percentage of students attending physical education classes in schools was higher.

It is interesting to note that students enjoy attending physical education classes at their school and sports clubs outside of school in almost equal measure (81% of respondents). The difference here is small and can hardly be considered significant.

An important factor for students is their parents' opinion and attitude towards their physical education classes: 87.5% of respondents indicate the active approval and support of their parents, who positively evaluate the physical and sports activities of their children who are involved in various types of physical education.

The active positive attitude of children towards physical education is also confirmed by the fact that 75% of respondents include time specifically allocated for physical education in their daily routine, especially those who already participate in sports clubs outside of school.

Respondents (more than 62%) say that convincing them of the need to actively engage in physical education can significantly influence their attitude towards it. At the same time, the effectiveness of methods of external stimulation of interest in physical education is somewhat inferior to that of persuasion (56.2% of respondents).

These facts indicate the existence of undoubtedly positive trends, demonstrating students' motivation to engage in physical education even in the difficult modern conditions of life in the Belgorod Oblast.

At the same time, some negative factors were identified, the elimination of which could increase the level of physical education and sports motivation among secondary school students. For example, 31.7% of them noted that no one had ever convinced children of the need to regularly engage in physical education.

More than 56% of the children surveyed believe that recently the number of schoolchildren willing to participate in sports clubs has decreased significantly.

Despite good attendance at physical education classes, 43.7% of respondents believe that physical education is completely irrelevant to their future plans. In other words, they do not see its importance for themselves personally, for their health, for their future professional training and in the years to come.

This survey result is confirmed by another indicator: 37.5% of respondents say that they have not yet achieved any goals through physical education and sports.

The data obtained requires further analysis and in-depth study. At the same time, based on the data obtained, it can already be stated that, using the example of the surveyed children of secondary school age (for example, in terms of the regularity of attendance at physical education classes), positive motivation among children remains despite the difficult conditions. However, it should be noted that not all children

took part in the survey for various reasons, including objective ones.

The most positive increase in the recorded survey indicators was contributed by children who not only regularly attend classes but also continue to play sports outside of school. It should also be noted that their answers on almost all items significantly improved the overall picture of the survey and the data collected. For example, it was noted that all school athletes clearly stated that their physical education teacher tries or tries very hard to encourage schoolchildren to actively engage in physical education, which is why the number of those willing to start playing sports is growing significantly rather than decreasing. They are never annoyed by the need to regularly attend physical education classes, which are important to them, and they see real benefits for themselves in these classes.

Children with a more passive attitude either skipped classes, did not attend sports training and competitions, or were ill and took the opportunity to skip classes. Therefore, there could have been many more problems identified.

The survey data reveals a tendency among schoolchildren to be independent and rely on their internal state, and therefore on internal motivation, while external motivation, judging by the questionnaire, becomes less attractive to respondents (stimulating interest), although it is not completely negated.

The negative features of schoolchildren's motivation are, first of all, that many still do not truly understand the social and personal significance of physical culture, do not realise its necessity and value not only in the present for themselves and for society as a whole, but also throughout their future lives. Therefore, it is necessary to seek and apply means and methods of theoretical and practical persuasion of adolescents, aimed at forming their internal basis of motivation. It is also necessary to skilfully combine in the work of teachers, coaches, and educators the means and methods of forming internal and external mechanisms of motivation for schoolchildren to regularly engage in physical education.

Conclusions. The study identified positive trends and factors indicating that secondary school students in the Belgorod Oblast remain motivated to participate regularly in physical education and sports despite the challenging circumstances in the region. This is confirmed by the regular attendance of physical education classes at school and sports activities outside school, as well as the inclusion of such activities in the daily routine. Negative factors have been identified that reduce the physical education and sports activity of schoolchildren, such as an insufficient understanding of the benefits of physical education for their own health, physical improvement, future professional training and subsequent adult life. The importance of the positive role of parents, physical education teachers and coaches in shaping physical education and sports motivation among schoolchildren is noted. There is a tendency among secondary school students to develop internal motivation for physical education and sports activities, highlighting the need to convince children of the necessity and importance of regular physical education and sports activities in combination with external stimulation of interest in the values of physical education.

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References

1. Ilin E.P. Motivatsiya i motivy. St. Peterburg: Piter, 2002. 512 p.
2. Leontev A.N. Potrebnosti, motivy, emotsii: konspekt lektsiy. Moskva: Izd-vo MGU, 1971. 38 p.
3. Molchanova Yu.S. Formirovanie potrebnostey k zanyatiyam fizicheskoy kulturoy u shkolnikov 14-15 let: avtoref. dis. ... kand. ped. nauk. Tambov, 2007. 23 p.
4. Chanal J., Cheval B., Courvoisier D.S., Poumier D. Developmental relations between motivation types and physical activity in elementary Scool children. Psyhology of Sport and Exercise. 2019. No. 43. Pp. 233-242.

Federal programmes and projects as a means of engaging the population in physical education and sport

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Abstract

Objective of the study is to analyse the effectiveness of regional mechanisms for involving the population of the Russian Federation in regular physical education and sports activities.

Methods and structure of the study. The research was conducted using a comprehensive approach based on an analysis of statistical data from the Russian Ministry of Sport and Rosstat, a comparative analysis of physical culture and sports development indicators, and an analysis of data from sociological surveys of the population conducted by the All-Russian Centre for Public Opinion Research and Counter-Training Centre 'Platform' between 2020 and 2024.

Results and conclusions. Scientific research has shown that in recent years there have been significant differences between regions in terms of the level of physical activity among the population. The gap between the leading regions and the outsiders is almost twofold, which indicates the need to develop more flexible, targeted measures for the development of physical culture and sport, taking into account the characteristics and potential of each region.

Among the most effective tools for encouraging the population to engage in regular sports activities, several areas can be identified, first and foremost the comprehensive development of accessible sports infrastructure, the systematic organisation of mass physical education and sports events, the use of public-private partnership mechanisms, the active introduction of digital services, and the adaptation of sports programmes to different age and social groups of the population.

Keywords: *physical education and sport, federal programmes, state policy, public involvement.*

Introduction. The development of physical culture and sport is one of the priority areas of the Russian Federation's state policy. The relevance of the study is linked to the need to assess the effectiveness of regional methods of involving the population in physical culture and sport. Various aspects of this issue are actively studied in scientific literature. T.N. Shutova, G.B. Glazkova, and O.N. Andryushchenko analyse modern methods of attracting the population to regular physical culture and sports activities, emphasising the need for a comprehensive approach that includes infrastructure development, information and educational work, and the creation of a motivational environment [6]. A.V. Ermakov and his co-authors investigate mechanisms for encouraging different age groups to engage in health-promoting activities, justifying the importance of a differentiated approach to the formation of physical activity, taking into account the age characteristics and needs of citizens [2]. K.I. Bratkov and Ya.V. Gurin consider the possibilities for improving the work of physical culture and sports clubs at places of study, residence and work as an effective tool for involving the adult population in systematic sports activities [1]. E.V. Likhacheva analyses the influence of objective and subjective regional factors on the development of physical culture and sport, demonstrating the importance of regional specifics in the development of programmes to promote a healthy lifestyle [5].

In 2020-2024, Russia is seeing positive dynamics in physical activity, but regional differences remain, which, of course, requires a comprehensive analysis of the factors influencing involvement and the identification of the most successful practices for forming a healthy lifestyle.

Objective of the study is to analyse the effectiveness of regional mechanisms for involving the popula-

tion of the Russian Federation in regular physical education and sports activities.

Methods and structure of the study. The study was conducted using a comprehensive approach and the following methods:

1. Analysis of statistical data from the Ministry of Sport of the Russian Federation, the Federal State Statistics Service (Rosstat), and summary reports 1-FK for the Russian Federation for 2020-2024.

2. Analysis of data from sociological surveys of the population conducted by the All-Russian Centre for Public Opinion Research and Counter-Training Centre 'Platform' in conjunction with the Ministry of Sport of the Russian Federation in the period 2020-2024.

Results of the study and discussion.

1. Trends in public participation in physical education and sports. An analysis of statistical data from the Ministry of Sport of the Russian Federation shows a steady positive trend in the population's involvement in physical culture and sports. In 2020, 43% of the population regularly participated in sports; in 2022, the figure was 52.95% (69.8 million people), in 2023 – 56.8% (75.7 million people), and in 2024, the 60% mark was exceeded for the first time, reaching 60.3% (80.452 million people).

Thus, over the four-year period from 2020 to 2024, the increase was 17.3%, which indicates the high effectiveness of the state programmes being implemented. The average annual growth rate in the number of people engaged in physical culture and sports was 4.3%, which is a great achievement in terms of international experience in the development of mass sports.

2. Regional differentiation in the level of physical activity among the population. At the end of 2023, the Sakhalin Region is the leader with an indicator of 67.1% (in 2022 – 63%), which is 10.3% higher than the Russian average. When analysing the indicators by federal district, the Far Eastern Federal District took the lead in 2023 (67.5%), demonstrating an increase of 6.5 per cent compared to 2022 (61.0%). Despite its concentration of sports infrastructure and financial resources, the Central Federal District ranks only sixth with an indicator of 59.7%, This indicates that high urbanisation and developed infrastructure do not always correlate with high levels of physical activity among the population, which requires further study of the socio-economic and cultural factors that influence citizens' sporting behaviour.

3. Effectiveness of federal projects and programmes. The main tool for attracting the population to physical culture and sports is the federal project 'Sport – the norm of life', implemented as part of the national project 'Demography' since 2019, the main goal of which is to increase the proportion of citizens who systematically engage in physical culture and sports to 70% by 2030.

The main areas of the project are: holding mass physical culture and sports events, developing a system of physical culture and sports clubs in residential areas, introducing the GTO complex, and conducting information and educational work to promote a healthy lifestyle.

The All-Russian Physical Culture and Sports Complex 'Ready for Labour and Defence' (hereinafter referred to as GTO), revived in 2014, plays a major role in involving the population – in 2024, there were more than 23.5 million registered participants.

Mass sporting events are an important factor in attracting citizens to physical education. For example, up to 13,500 official physical education and sporting events are held annually, including the All-Russian Spartakiad between the constituent entities of the Russian Federation, All-Russian school competitions (Presidential Competitions, 'Presidential Sports Games'), mass events: 'Cross of Nations', 'Skiing Russia', Spartakiads of labour collectives, summer and winter rural sports games.

The federal project 'Business Sprint' (from 2022) is aimed at attracting private investment in the creation of sports infrastructure. It provides for the provision of federal subsidies to regions for co-financing public-private partnership projects in the sports sector.

Conclusions. The study showed that in recent years there have been significant differences between regions in terms of the level of physical activity among the population. The gap between the leading and lagging regions is almost twofold, which indicates the need to develop more flexible, targeted measures for the development of physical culture and sport, taking into account the characteristics and potential of each region.

Among the most effective tools for encouraging the population to engage in regular sports activities, several areas can be identified, first and foremost: the comprehensive development of accessible sports infrastructure, the systematic organisation of mass physical education and sports events, the use of public-private partnership mechanisms, the active

introduction of digital services, and the adaptation of sports programmes to different age and social groups of the population.

References

1. Bratkov K.I., Gurin Ya.V. Sovershenstvovanie sposobov privlecheniya vzroslogo naseleniya k regulyarnym zanyatiyam fizicheskoy kulturoy i sportom v fizkulturno sportivnyh klubah po mestu ucheby, prozhivaniya i raboty. Vestnik sportivnoy nauki. 2020. No. 3. Pp. 50-54.
2. Ermakov A.V., Oblog K.A., Shchegoleva A.P., Ziborova S.A. Razrabotka modulya «C» – privlechenie raznyh vozrastnyh grupp naseleniya k zdorovesberezheniyu – dlya kompetentsii «Fizicheskaya kultura, sport i fitness» po standartam «Worldskills Russia». Vestnik sportivnoy nauki. 2020. No. 3. Pp. 69-73.
3. Issledovanie vovlechennosti naseleniya Rossii v sport i fizkulturu. TSSP «Platforma» sovmestno s Ministerstvom sporta RF, 2018-2022 gg. Vedomosti. 2023 (date of access: 25.10.2025).
4. Kolichestvo zanimayushchihsya sportom rossiyan vpervye v istorii strany prevysilo 60%. Ministerstvo sporta RF. Kommersant. 2025. (date of access: 25.10.2025)
5. Lihacheva E.V. Fizicheskaya kultura i sport v sisteme obektivnyh i subektivnyh faktorov regiona. Vlast i upravlenie na Vostoke Rossii. 2018. No. 2(83). Pp. 64-71.
6. Shutova T.N., Glazkova G.B., Andryushchenko O.N. Sposoby privlecheniya naseleniya k regulyarnym zanyatiyam fizicheskoy kulturoy i sportom. Uchenye zapiski universiteta P.F. Lesgafta. 2023. No. 4(218). Pp. 486-491.

Special physical training for senior school pupils within the framework of the 'Sports Games' section

UDC 796

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Abstract

Objective of the study is to determine attitudes towards basketball and volleyball as compulsory subjects and the actual level of mastery of basic technical elements in accordance with the Federal State Educational Standards.

Methods and structure of the study. A questionnaire survey and pedagogical testing in basketball and volleyball were conducted among 25 first-year students. The article presents a study of the level of technical preparedness and attitude towards sports games among 9th grade graduates of schools in the Republic of Karelia. The work was carried out at the Petrozavodsk Basic Medical College.

Results and conclusions. The results showed an extremely low level of training in basketball and insufficient training in volleyball (48% failed to master the underhand pass and serving accuracy). Forty per cent experienced negative feelings from basketball classes, 36% did not like the sport; the attitude towards volleyball was predominantly positive. Eight per cent noted that basketball was not taught at school at all, 12% did not remember such lessons. The author concludes that there has been a systematic deterioration in the quality of teaching since the abolition of the compulsory school sports competition (2012), a lack of supervision of physical education teachers and their low motivation, despite the high accessibility of the Lokobasket and KES-Basket projects. It is recommended to strengthen administrative control and restore the popularity of school sports games, as well as to increase the proportion of game sports in physical education classes.

Keywords: *senior classes, physical education, physical training, team sports, school curriculum.*

Introduction. In today's world, physical education for schoolchildren requires effective methods that foster lasting motivation for sports and improve physical fitness. The most promising and scientifically sound approach is considered to be the widespread use of team sports in physical education classes. Research (by L.A. Nepovinnykh, V.K. Balsevich, E.A. Gromova, N. Hermens, and others) proves that a sports-oriented approach accelerates the development of coordination, speed and strength qualities, tactical thinking, and teamwork skills.

However, despite the inclusion of basketball and volleyball in the school curriculum with a sufficient number of hours, the technical preparedness of 9th grade graduates (including in Karelia) is declining every year. This has led to a sharp decline in the number of school teams participating in city championships, even with the existence of federal projects such as Lokobasket and KES-Basket.

Objective of the study is to determine attitudes towards basketball and volleyball as compulsory subjects and the actual level of mastery of basic technical elements in accordance with the Federal State Educational Standards.

Methods and structure of the study. Analysis of literature, questionnaires and surveys of 25 students of Petrozavodsk Basic Medical College (19 girls, 6 boys) who recently completed 9th grade, as well as pedagogical testing of technical standards in basketball and volleyball under the guidance of experienced specialists.

The Lokobasket and KES-Basket projects ensure high accessibility: any schoolchild can represent their school in official competitions, but only students from

that institution are allowed to participate. Schools receive balls for participating in the municipal stage, and finalists receive uniforms. Despite ideal conditions and material support, in the 2022–2023 season, only three teams from 50 schools in Petrozavodsk participated in the Lokobasket city championship for girls. The author sees the main reasons for non-participation in the inertia or professional incompetence of physical education teachers, as well as in the cancellation of the compulsory Spartakiad school sports competition after 2012.

Results of the study and discussion. When reviewing basketball and volleyball assignments for schoolchildren, specialists wondered whether classes in these sports were held at school (Fig. 1). This was the aim of the first study.

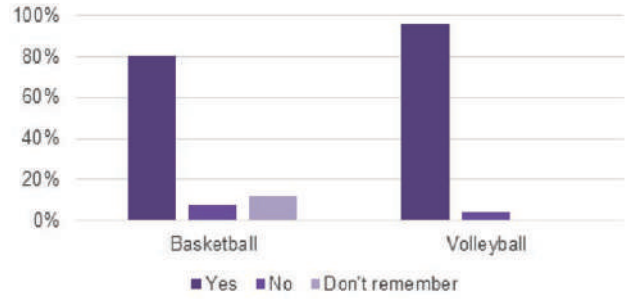

Figure 1. Did you have basketball and volleyball classes in physical education?

Based on the results of the first study, 8% of the students surveyed indicated that basketball was not played at all in physical education classes at school, one person also answered about volleyball, and 12% of the respondents did not remember whether teachers played basketball in class or not.

Next, we sought to determine what impressions former schoolchildren had of basketball and volleyball lessons and what their attitude towards these sports was (Fig. 2).

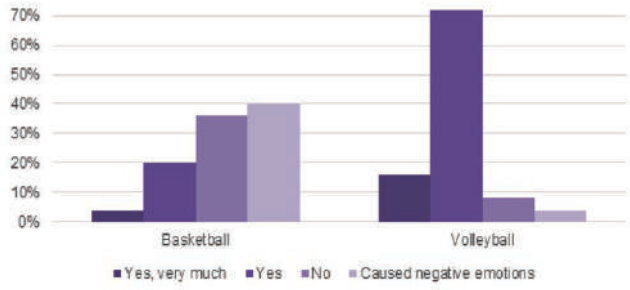

Figure 2. Did you enjoy the volleyball and basketball classes held at your school?

Analysis of Fig. 2 reveals an alarming signal: 40% of respondents had negative experiences playing basketball, another 36% did not like the sport; only one person likes basketball, and 20% have a positive attitude towards it. Attitudes towards volleyball are significantly better: 16% love it, 72% like it, 8% did not like it, and only one person had an extremely negative impression.

The third study assessed the technical skills of former schoolchildren in basketball using three simple tests:

1. Dribbling test. Five cones are placed parallel to the sideline at 2 m intervals. The player starts from the front line, dribbles the ball with their right hand to the last cone, returns with their left hand and finishes at the free throw line. The best time from two attempts is recorded. For mistakes (carrying the ball, double dribbling, missing a cone, losing the ball) – a 5-second penalty for each.

2. Shooting accuracy test. The player takes five shots from each of five fixed points (25 shots in total) – to the left of the backboard parallel to the front line through the centre of the hoop, to the left at a 45° angle, from the free throw line and symmetrically to the right. Two partners pick up the balls and return them with an accurate pass; Only successful passes are counted; a two-handed pass from below is considered a violation.

3. Test: The player stands behind the line (3 m from the wall) and makes as many two-handed chest passes as possible in 30 seconds. Only quality passes are counted; if control is lost, the ball is not counted.

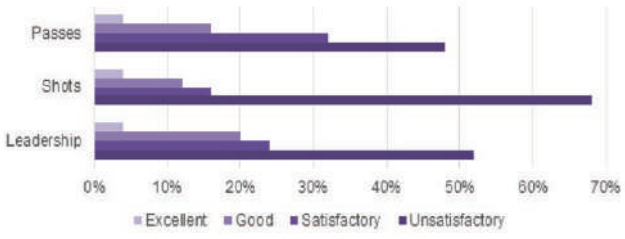

Figure 3. Assessment of students' technical preparedness in basketball?

As shown by the results of the third study (Fig. 3), most students are not trained in the simplest and most basic elements of basketball.

The fourth study determined the level of technical preparedness of students in volleyball (Fig. 4), for which experienced teachers conducted three tests:

Table. Methodology for assigning test scores

Study	Third study						Fourth study			
Test number	Test 1		Test 2		Test 3		Test 1	Test 2	Test 3	
Unit of measurement	Number of sec.		Number of times						Number of points	
Assessment Gender	M	F	M	F	M	F	M and F	M and F	M	F
Satisfactory	under 18	20	6	5	12	10	10	8	9	9
Good	12	14	8	7	15	14	14	12	16	14
Excellent	8	10	10	9	20	18	20	20	21	18

1. Overhead pass test. Passing over the head. Task: the student performs overhead passes over their head at a height of 60-80 centimetres. The number of clean passes without losing control of the ball is recorded. The best result from two attempts is evaluated;

2. Lower pass test. Task: similar to the upper pass test, but the student performs a pass from below;

3. Serve accuracy test. Task: the student performs 9 serves in any way from behind the front line, trying to hit zones 1, 6 and 5 in turn, consecutively. The number of accurate serves that hit the court or the specified zones is counted. Hitting the court is worth 1 point, hitting the specified zone is worth 3 points.

Figure 4. Assessment of students' technical preparedness in volleyball?

Former schoolchildren's technical skills in volleyball are better than in basketball, but still leave much to be desired: 48% of opponents failed the tests on underhand passes and serving accuracy. Only one person was able to serve accurately into the areas specified by the teacher and receive an 'Excellent' grade.

Grades for the third and fourth studies were given according to the table.

Conclusions. The study revealed an extremely low level of technical preparedness among ninth-grade graduates in basketball and volleyball, as well as a negative attitude towards basketball among 76% of respondents.

Based on the sociological survey, it is recommended to introduce a third physical education lesson per week, entirely devoted to one type of game. In standard lessons, focus on sports games in the main part (28–32 minutes), leaving 10 minutes for warm-up and 3–5 minutes for recovery. Switch to a modular principle (6-8 lessons in a row for one sport). Include at least 12-15 minutes of two-sided play. Restore mandatory participation in Lokobasket and similar projects.

The implementation of these measures will significantly increase schoolchildren's preparedness and interest in team sports.

References

1. Kremneva V.N. Analiz urovnya fizicheskoy aktivnosti i zdorovogo obraza zhizni sredi uchashchihsya starshih klassov. Mir pedagogiki i psihologii. 2025. No. 7(108). Pp. 140-147.
2. Kremneva V.N., Zabrovskaya M.E. Monitoring razvitiya silovyh kachestv u uchenits 9-h klassov sredstvami atleticheskoy gimnastiki na urokah fizicheskoy kultury. Standarty i monitoring v obrazovanii. 2024. V. 12. No. 6. Pp. 19-23. DOI: 10.12737/1998-1740-2024-12-6-19-23. EDN: AGETOG.
3. Nepovinnyh L.A. Nedostatok dvigatelnoy aktivnosti v zhizni detey. Tendentsii razvitiya nauki i obrazovaniya. 2024. No. 109-112. Pp. 74-77. DOI: 10.18411/trnio-05-2024-619. EDN: SQQHBD.

The effect of neurofitness on correcting the psychoemotional state of students

UDC 796

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Abstract

Objective of the study is to reveal the effectiveness of including neurofitness in the daily physical activity of students to correct their psycho-emotional state.

Methods and structure of the study. During the study, surveys and questionnaires were conducted, in which 1324 first-year students participated. The control group (CG, n=15) and the experimental group (EG, n=15) included students from St. Petersburg State University.

Results and conclusions. Analysis of the results revealed that more than 43% of first-year students experience psycho-emotional stress, and factors influencing the development of stress states were also identified. The authors proposed a method for incorporating neurofitness into students' daily physical activity to correct their psycho-emotional state, based on block grouping of specially selected exercises for the purposes of each section. The study found that improvements in the EG averaged 24.7%, while in the CG they averaged only 7.3%.

Keywords: *neurofitness, students, psycho-emotional state, physical culture, sport.*

Introduction. Recent studies emphasise the importance of students' psycho-emotional state both at the beginning and at the end of their studies. Stress has become an integral part of modern life [1–6]. Tokareva A.V. (2016), Cheremiskina I.I. (2021), Pavlenko D.Yu. (2024) argue that students, particularly first-year students, experience enormous psycho-emotional overload, which is associated with their integration into the student community, changes in their living conditions, and increased demands on their cognitive abilities [4–6]. Thus, the search for ways to correct the psycho-emotional state through physical culture remains quite relevant.

One of the most promising areas that meets this need is neurofitness. Within the framework of physical education, neurofitness is evolving from the development of physical qualities to the targeted improvement of cognitive functions and the psycho-emotional state of a person.

Objective of the study is to reveal the effectiveness of including neurofitness in the daily physical activity of students to correct their psycho-emotional state.

Methods and structure of the study. The study involved 1324 first-year students at universities in St. Petersburg. The control group (CG, n=15) and experimental group (EG, n=15) consisted of students from St. Petersburg State University.

To determine the effectiveness of incorporating neurofitness into students' daily physical activity for the purpose of correcting their psycho-emotional state, the following research methods were used: analysis of scientific, methodological, and specialised literature, surveys, and questionnaires.

Results of the study and discussion. According to surveys and questionnaires, it was found that out of 1324 first-year students surveyed, more than 43% experience psycho-emotional stress manifested as anxiety, of which 15% reported depression, 10% had experienced at least one panic attack in the past year, and another 2.3% openly reported that they had taken or were currently taking antidepressants. Factors in-

fluencing the development of stress were also identified:

1. Lifestyle changes (36% of respondents identified this factor as the most important, of which more than 60% were non-local students);

2. Academic pressure (32% of students believe that their anxiety is caused by excessive demands from teachers, writing academic papers, participating in various projects, and taking exams);

3. Social adaptation (27% of first-year students surveyed experienced stress due to the need to make new acquaintances and build friendships with classmates and fellow students, with more than 80% of them noting that they feel much more comfortable communicating with the student community via messenger than in person);

4. Financial difficulties were noted as a stress factor by 3% of respondents.

5. Lack of support from loved ones (2% feel lonely, of which 93% are non-resident students).

Numerous studies show that regular, accessible and interesting physical activity is inversely related to stress and its consequences. A new field called 'neurofitness' is presented as an effective means of improving psycho-emotional health through a combination of physical exercise and brain training. Based on an analysis of specialised and scientific research literature, we developed a method for incorporating neurofitness into students' daily physical activity to correct their psycho-emotional state, based on block grouping of specially selected exercises for the purposes of each section (Fig. 1). For students in the ex-

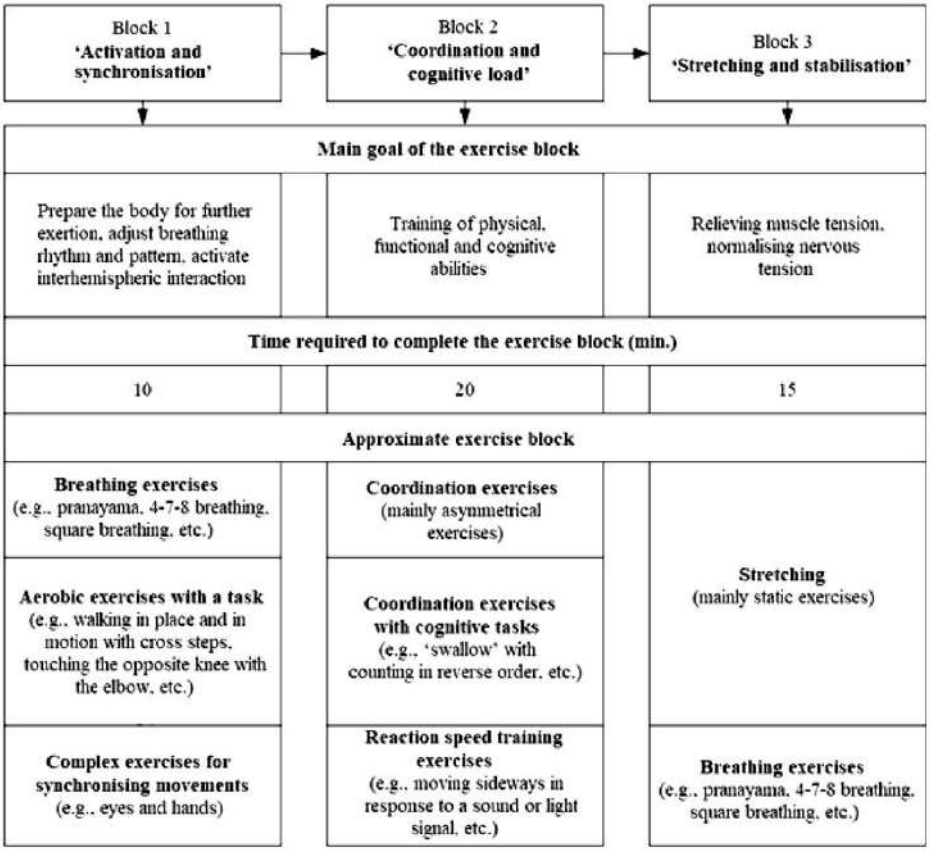

Figure 1. Diagram showing how to put together a set of neurofitness exercises

Table 1. Results of the survey of students at the beginning and end of the study

Indicator under study	At the beginning of the study		At the end of the study	
	EG	CG	EG	CG
Beck Anxiety Inventory (BAI)	26,7±2,4	26,3±2,9	22,8±1,5	25,8±3,1
Beck Depression Inventory (BDI-II)	8,1±1,7	8,4±2,1	5,3±1,2	7,9±2,6
Panic Disorder Severity Scale (PDSS)	7,6±3,4	7,8±2,8	5,7±4,1	6,7±2,9

perimental group (EG, n=15) in the autumn semester, a basic set of neurofitness exercises and exercise options were offered as a supplement to daily physical activity, allowing for individualisation depending on the physical and psycho-emotional state before the actual class; for the control group (CG, n=15), no such changes were envisaged.

Analysis of the results shows a significant improvement in the psycho-emotional state of the first-year students who participated in the experiment (Table 1). According to the results of the Panic Disorder Severity Scale (PDSS) at the beginning of the study, both the EG and CG showed a mild degree of panic attacks, with the maximum changes in this indicator (almost 25%) occurring in the EG after daily neurofitness classes, while in the CG this indicator improved by 14.1% over the 4 months of the autumn semester. The greatest changes occurred in the results of the Beck Depression Inventory (BDI-II) questionnaire, with 34.6% in the EG and 5.9% in the CG. Thus, improvements in the EG averaged 24.7%, while in the CG they averaged only 7.3%.

Conclusions. According to the results of the study, it can be argued that neurofitness has a positive effect on the psycho-emotional state of first-year students. Regular performance of the proposed complex and its individualised variants, as noted by the students, helped them cope with stress, increase emotional stability and adapt to new living conditions, which in turn contributed to the creation of a more effective and favourable educational environment.

References

1. Koshmanova D.S., Kirbay K.K. Vliyanie fizicheskoy aktivnosti na kognitivnye sposobnosti studentov meditsinskikh vuzov. V sbornike: Aktualnye aspekty razvitiya nauki i obshchestva v epokhu tsifrovoy transformatsii (shifr – MKAA). Sbornik materialov XXII Mezhdunarodnoy nauchno-prakticheskoy konferentsii. Moskva, 2025. Pp. 460-465.
2. Lesheva N.S., Sharonova A.V., Mironova O.V., Moskalenko I.S. Formirovanie tvorcheskoy kompetentnosti studentok v usloviyakh elektivnykh kursov po fizicheskoy kulture i sportu. Teoriya i praktika fizicheskoy kultury. 2019. No. 11. Pp. 58-59.
3. Lesheva N.S., Kurova N.V., Nikolenko O.A., Goncharov V.A. Ispolzovanie kompleksa silovoy aerobiki dlya adaptatsii studentov-psikhologov k professionalnoy deyatelnosti. Kultura fizicheskaya i zdorove. 2025. No. 1(93). Pp. 130-135.
4. Pavlenko D.Yu., Sharonova A.V. Vliyanie fizicheskoy kultury na emotsionalno sostoyanie studenta. V sbornike: Aktualnye voprosy sovremennoy nauki: teoriya, tekhnologiya, metodologiya i praktika. Sbornik nauchnykh statey po materialam XV Mezhdunarodnoy nauchno-prakticheskoy konferentsii. Ufa, 2024. Pp. 349-353.
5. Tokareva A.V., Mironova O.V., Moskalenko I.S., Bolotin A.E., Yarchikovskaya L.V. Formirovanie navykov organizatsii samostoyatelnykh aerobnykh trenirovok u studentov vuzov dlya uspeshnoy sdachi ekzamenatsionnoy sessii. Teoriya i praktika fizicheskoy kultury. 2016. No. 9. Pp. 12- 15.
6. Cheremiskina I.I., Elzesser A.S. Otnoshenie k stressu u studentov pervogo kursa meditsinskogo vuza. ANI: pedagogika i psikhologiya. 2021. No. 1(34). URL: https://cyberleninka.ru/article/n/otnoshenie-k-stressu-u-studentov-pervogo-kursa-meditsinskogo-vuza (date of access: 16.01.2026).

The effectiveness of sports and health tourism in organising student recreation in the subtropical climate zone

UDC 379.85

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Abstract

Objective of the study is to optimise students' summer holidays in the subtropical climate zone through the targeted use of sports and health tourism.

Methods and structure of the study. The research was conducted between 24 June and 14 July 2025 at Adlerkurort in Sochi on the platform of the Centre for Innovative Tourism Development of St. Petersburg State Economic University. A total of 135 students, 52 males and 83 females, aged 18-19, were examined. Functional status was assessed using the Ruffier test, the Stange test, PWC170, HR, and BP.

Results and conclusions. The authors developed a multi-purpose programme lasting 21 days, including 12 training sessions conducted on mountain routes of 3, 5 and 7 km in subtropical climatic conditions. The data obtained in the course of the study prove that in subtropical conditions, tourism accelerates the processes of restoring activity, working capacity and adaptive reserves.

Keywords: *adaptation, regulatory systems, climatogeographical factors, chronobiological adaptation, functional state.*

Introduction. Tourism (from the French tour, meaning “travel”), as an area of natural resource use in improving human activity and health, has evolved into various technologies and methodological constructs [1]. In particular, the first information about natural factors (terrain, water, nutrition) used to improve health was described by Hippocrates in his work ‘On Airs, Waters, and Places’ (‘Hippocratic Collection’, 370 BC).

The phenomenon of ‘sports and health tourism’ reveals the superposition of two code systems: sports and tourism. They set the permissible limits of activity in the natural determination of human physicality. The code system of sports is aimed at achieving record results in mountain tourism. In particular, this includes the ascent of Mont Blanc, 4,810 m high, in 1786, the stratovolcano Chimborazo (6,268 m) in 1880, and Everest (8,848 m) in 1920, where the limits of human capabilities in conditions of low air temperatures and hypoxia are manifested [3].

The first information describing human adaptation to prolonged stress in conditions of a changing natural and climatic environment was obtained during the expeditions of I. Krusenstern, N. Rezanov (1803), F. Bellingshausen, Y. Lisyansky (1819), and Semenov-Tian-Shansky (1857).

Applied science focuses on determining the limits of human adaptation to extreme factors. The operational focus of research by specialists at the Central Institute of Labour (1920) is based on an ‘energy’ methodology in the development of principles, categories, and concepts of tourism development. The research on the processes of the body's adaptation to prolonged stress, obtained during the expeditions of N. Roerich (1923-1928), the Arkhangelsk-Moscow ski crossings, the Khabarovsk-Moscow bicycle races (1934), and V. Chkalov's flight from Moscow to Vancouver (USA) in 1937.

In 1970-1980, a verified database was created on the stress of regulatory systems, which changes under the influence of psychophysical stress, circa-

dian rhythms, and climatic conditions during travel. According to empirical data obtained by Yu. Senkevich during an expedition in the Atlantic Ocean (1969), monitoring climatogeographical adaptation provides another dimension to the diversity of vital processes. This information is expanded by data on physiological reserves recorded during D. Shparo's ski expedition to the North Pole (1979). The implementation of tasks related to the assessment of the psychophysical stability of the organism has been proven by F. Konyukhov's observations on expeditions to the North Pole (1990), Everest (1992), the Silk Road (2002), by hot air balloon (2016), and during a boat crossing of the Pacific Ocean (2019) [4].

The established system of views and methodological constructs has been verified by studies of the behavioural, socio-psychological, and physiological aspects of human adaptation to changes in the environment, which prove the growth of systemic resources for sports and health tourism (V. Boiko, M. Vorontsova, L. Zakharova, G. Karpova, V. Kvartalnikov, E. Kuzmina) [6].

Despite the prospects for solving the problem of maximising the potential of sports and health tourism during the summer holidays, insufficient attention is paid to the analysis of factors and processes that strengthen students' health.

Objective of the study is to optimise students' summer holidays in the subtropical climate zone through the targeted use of sports and health tourism.

Methods and structure of the study. The research was conducted between 24 June and 14 July 2025 at Adlerkurort in Sochi on the platform of the Centre for Innovative Tourism Development of St. Petersburg State Economic University.

The first stage included an assessment of the psychophysical condition of students in the conditions of exam session entropy. In a group of 135 students, males (n = 52) and females (n = 83) aged 18±0.4 years, the functional stability of the body was determined using the Ruffier, Stange, PWC_{170}, and HR tests. Energy and plastic processes and total metabolism (TM) were selected as indicator parameters. Body length and weight, fat and muscle components were determined using the ABC-01 Medass method. Mental state was assessed based on parameters of well-being, activity, mood (SAN), degree of involvement, fatigue, interest, and entertainment, evaluated using the Life Style Index (LSI) scale [5].

The results of the analysis formed the basis of a multi-purpose programme (lasting 21 days) designed to improve the students' physical condition. Its main resource consisted of 12 training sessions conducted on mountain routes of 3, 5 and 7 km in subtropical climatic conditions. Feedback was provided by Huawei Band 7 microprocessors, which improve the operational efficiency of control over parameters such as speed, number of steps, heart rate response to load (HR), and oxygen concentration.

The second stage involved assessing the stress on regulatory systems during adaptation to loads performed in subtropical conditions. The research results were processed using an integrated multidimensional analysis system based on Microsoft Access, Excel, and BIOSTAT software.

Results of the study and discussion. The anthropometric parameters of men included changes in body length (170.2 ± 4.6 cm), body weight (72.4 ± 2.6 kg), muscle mass (MM) (32.0 ± 1.8%), and fat mass (FM) (13.1 ± 1.1%). To assess the mental state of students, the following were recorded: scores for engagement, fatigue, and interest, which did not exceed 5.1±0.8 points. The symptoms of CNS overload, disturbances in the 'physiological clock' of sleep and wakefulness (3.9±0.1 points), and discomfort ($t=2.14$ $p\leq0.05$) identified in 47 students in this group had regulatory consequences. Along with this, the parameters of the Ruffier index 10.8±0.1 conditional units, the Stange test 41.8±0.2 s, and the PWC_{170} work capacity 14.1±0.3 kgm/min/kg were established, indicating low regulatory reserves (-0.503), which is largely explained by a deficit in motor activity (MA) of 3.2±0.1 thousand steps and energy expenditure of 2610.60±18.5 kcal ($t=2.14$ $p\leq0.05$).

The following anthropometric metrics were identified in the female group: height 165.2±6.4 cm, weight 53.5±3.2 kg, body MM 27.4.0±1.2%, FM 18.6±4.1%. Fifty-two students were found to have a lower threshold of resistance to the stress factor of exams, associated with an insufficient volume of MA 2.7±0.3 thousand steps, energy expenditure 2160.26±11.5 kcal (–0.530). The identified indicators of the Ruffier index 10.2±0.4 conditional units, the Stange test 40.2±0.2 s, PWC_{170} up to 13.5±0.3 kgm/min/kg (–0.573) reflect a low level of function-

al resources and the power of regulatory reserves.

During observations conducted in St. Petersburg and Sochi, a tendency towards a decrease in the tension of regulatory systems was found in the subjects of both groups. The general condition, daily sleep and activity biorhythms, compared to the initial level, return to normal values on day 2.

The amount of physical activity did not exceed the threshold values of stress on regulatory systems under conditions of chronobiological and climatogeographical adaptation to the subtropics. The core of the programme consists of 12 physical training sessions, taking into account the specialisation of work on a mountain route. 75% of the total load is performed in aerobic energy supply mode (AP-1 – AP-2). The volume of medium-intensity loads (3-4 power range) is 12% of the total. The training sessions are aimed at developing general endurance, increasing the speed of recovery processes and improving motor skills [7-10]. The parameters of the impact were adjusted according to the amplitude-frequency parameters. The content of technical training is related to the development of location skills in the field, mountain movement techniques, and overcoming water obstacles [2]. The training was supplemented by swimming in the sea in the evening.

A gradual increase in the intensity of training contributed to the acceleration of metabolic processes and neuromuscular potentiation [8-10]. This is indicated by the improvement in motor skills, physical condition and energy resources (0.522) observed on day 6. There was an increase in training satisfaction (6.1±0.8 points), motivation (6.4±0.3 points) and exercise tolerance (7.2±0.4 points). Our results are fully comparable with the data in the literature.

Testing conducted at the final stage shows that the male and female groups achieved stable adaptation to subtropical conditions. The cumulative effect of increasing MA to 16.0±0.4 thousand steps, 6202.14±11.2 kcal (t=2.27 p≤0.05) in the male group is expressed by a strong adaptive response. Sustainable adaptive changes are indicated by an improvement in psychophysical condition, assessed by the parameters of involvement 8.1±0.3 points, interest 7.2±0.1 points (t=2.24 p≤0.05), SAN up to 8.4±0.6 points (t=2.21 p≤0.05). Positive shifts are observed in the development of metabolising body mass and improvement of the respiratory and cardiac systems: the Ruffier index reaches 9.0±0.1 conventional units, the Stange test 45.8±0.3 s, PWC_{170} increases to 18.5±0.3 kgm/min/kg (0.612).

Accordingly, the psychophysical state of the female group changes in response to stress and natural stimuli. It has been established that the depth of the training effect in subtropical conditions increases due to cumulative effects. The programme's target emphases cause positive shifts in morphological, physiological, and biomechanical adaptation. It should be noted that the parameters of the motor-energy function of female students correlate positively with an increase in MA of 15.2±1.1 thousand units, 5501.16±12.4 kcal, and an increase in SAN of 8.9±0.6 points (t=2.26 p≤0.05). The final testing revealed an improvement in respiratory and cardiac functions: the Ruffier index reached 9.4±0.1 conventional units, the Stange test 42.1±0.3 s, and an increase in PWC_{170} to 17.6±0.3 kgm/min/kg (0.612), indicate the adequacy of the training loads applied during the period of chronobiological and climatogeographical adaptation.

The developed approach grows into the conceptual imperative of 'biological determinism' in sports and health tourism, which is universal in nature. Various combinations of natural factors and load parameters create a basis for substantiating the principles of the theory of sports and health tourism.

Conclusions. The experience of incorporating sports and wellness tourism into the structure of students' summer holidays is representative. The results of the study prove the effectiveness of controlled adjustment of biotic load parameters, reinforced by natural stimuli. The innovative programme contributes to the acceleration of recovery, increased adaptive reserves and improved health among students.

References

1. Venediktov I.V., Yarchikovskaya L.V., Mironova O.V., Sharonova A.V., Lukina S.M. Povyshenie rabotosposobnosti obuchayushchikhsya metodom reglamentirovannogo upravleniya dykhaniem. Teoriya i praktika fizicheskoy kultury. 2023. No. 4. Pp. 58-60.
2. Grigorev V.I. Atributivnaya spetsializatsiya rossiyskogo turizma na raznykh ontologicheskikh etapakh razvitiya. Fizicheskaya kultura i sport v XXI veke: aktualnye problemy i puti resheniya: materialy V-y Mezhdunarodnoy

nauchno-prakticheskoy konferentsii (Volgograd, 1-2 oktyabrya 2025 goda). Ch. 2. Volgograd: FGBOU VO «VGAFK», 2025. Pp. 350-355.
3. Grigorev V.I. Fizicheskaya kultura v srednikh spetsialnykh i vysshikh uchebnykh zavedeniyakh. Spetsialnye vidy turisticheskoy deyatelnosti. Professionalno-prikladnoy turizm v fizicheskoy kulture studentov: Uchebnik. SPb.: OOO «Kopi-R», 2010. Pp. 68-91.
4. Zorin I.V., Kvartalnikov V.A. Entsiklopediya turizma: Spravochnik. Moskva: Finansy i statistika, 2014. 368 p.
5. Indeks zhiznennogo stilya. Life Style Index, LSI. URL: https://psycabi.net/testy/310-oprosnik-plutchika-kellermana-konte-metodika-indeks-zhiznennogo-stilya-life-style-index-lsi-test-dlya-diagnostiki-mekhanizmov-psikhologicheskoj-zashchity. (date of access: 10.06.2025).
6. Konstantinov Yu.S. Sportivno-ozdorovitelnyy turizm. Teoriya i praktika: ucheb. posobie. Moskva: OOO «Torgovyy dom «Sovetskiy sport», 2023. 350 p.
7. Mironova O.V., Dementev K.N., Pristav O.V. Opredelenie proektnykh vozmozhnostey razvitiya fizicheskoy kultury studentov v novykh usloviyakh. Fizicheskaya kultura i zdorove studentov. 2016. Pp. 55-57.
8. Tokareva A.V., Mironova O.V., Moskalenko I.S., Bolotin A.E., Yarchikovskaya L.V. Formirovanie navykov organizatsii samostoyatelnykh aerobnykh trenirovok u studentov vuzov dlya uspeshnykh rezultatov ekzamenatsionnoy sessii. Teoriya i praktika fizicheskoy kultury. 2016. No. 9. Pp. 12-15.
9. Sharonova A.V., Portnova L.N., Sokolovskaya O.L. Vliyanie gipoksicheskoy trenirovki v tekhnike kumbkhaka na proyavlenie rabotosposobnosti studentov v nagruzkakh s povyshayushcheysya moshchnostyu. V sbornike: Zdorovesberezhenie kak innovatsionnyy aspekt sovremennogo obrazovaniya: sb. mater. V Mezhdunar. nauch. prakt. internet-konferentsii. Sankt Peterburg, 2024. Pp. 131-136.
10. Yarchikovskaya L., Grigorev V., Mironova O., & Sharonova A. History and present day of the formation of the subjectivity of Russian tourism. Theory and Practice of Physical Culture. 2025. No. 10. Pp. 61-64.

Physical fitness and development of female students in the Siberian Region

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Abstract

Objective of the study is to conduct a theoretical and statistical analysis of the physical fitness and physical development of female students in their first to third years of study in the Siberian region (using Krasnoyarsk State Agrarian University as an example), on the basis of which to develop corrective organisational and methodological recommendations and implement them in physical education practice.

Methods and structure of the study. The study was conducted at the educational base of Krasnoyarsk State Agrarian University between 2024 and 2025. The sample size was 180 female students in their first to third years of study. Control groups of female students were formed using random sampling. The following methods were selected and used to organise and conduct the analytical study: analysis of scientific and methodological literature, pedagogical observation, surveys, questionnaires, physical fitness testing, measurement of physical development indicators, systematisation, abstraction, mathematical statistics methods, etc. During the academic year, first- to third-year female students were tested for physical fitness according to the following indicators: push-ups, standing long jump, sit-ups per minute, 2000-metre run, 100-metre run, forward bend from a standing position, as well as measurements of physical development: height and weight, hand dynamometry (right and left hands) and measurement of heart rate at rest while sitting per minute. All of the above indicators were compiled and systematised in a table, on the basis of which the analysis was carried out.

Results and conclusions. During the experimental work, six indicators of physical fitness and five indicators of physical development were analysed. The total number of various measurements exceeded 2,000 units. The significant factual material collected made it possible to identify the dynamics and state of physical fitness and physical development of female students in their first to third years at Siberian universities (using the example of students at Krasnoyarsk State Agrarian University). The physical development indicators for first- to third-year female students increased on average: in height by 1.3%, in body weight by 1.5%, in hand dynamometry: right hand by 25% and left hand by 26.6%. In terms of physical fitness, female students showed a significant increase on average in sit-ups per minute – 21.2% and forward bend from a standing position – 36.1%, strength indicators increased by 2.3% and speed-strength indicators by 3.1%, and speed indicators in the 100-metre run improved by 1.3%. These indicators allow us to conclude that female students show significant positive dynamics in the improvement of their physical development and physical fitness. Making additional methodological adjustments to the physical education programme for female students in the Siberian region (using Krasnoyarsk State Agrarian University as an example) will increase the effectiveness of improving the physical development and fitness indicators of female students by their third year of university.

Keywords: *physical fitness, physical development, female students, Siberian region, dynamics.*

Introduction. Student years are an important part of the formation and development of young people's mental and physical potential. During this period, students actively develop professional competencies for their future careers and continue to build their physical health. Physical health generally determines professional activity and working capacity in future life. Therefore, during the process of higher education, it is necessary to pay significant attention to the harmonious physical education of young students as a necessary condition for effective professional activity in the future. However, as practice shows, university graduates have low levels of physical fitness, physical development, etc. This trend is especially common among female students, where up to 60% of the total student body has low levels of physical

fitness and development, which is directly related to reproductive health. All of this together determined the topic of the study, which aims to improve the effectiveness of physical education for young people, especially female students, at universities.

Objective of the study is to conduct a theoretical and statistical analysis of the physical fitness and physical development of female students in their first to third years of study in the Siberian region (using Krasnoyarsk State Agrarian University as an example), on the basis of which to develop corrective organisational and methodological recommendations and implement them in physical education practice.

Methods and structure of the study. The study was conducted at the educational base of Krasnoyarsk State Agrarian University between 2024 and 2025. The sample size was 180 female students in their first to third years of study. Control groups of female students were formed using random sampling. The following experimental methods were selected and used to organise and conduct the analytical study: analysis of scientific and methodological literature, pedagogical observation, surveys, questionnaires, physical fitness testing, measurement of physical development indicators, systematisation, abstraction, mathematical statistics methods, etc. During the academic year, first- to third-year female students were tested for physical fitness according to the following indicators: push-ups, standing long jump, sit-ups per minute, 2000-metre run, 100-metre run, forward bend from a standing position, as well as measurements of physical development: height and weight, hand dynamometry (right and left hands) and measurement of heart rate at rest while sitting per minute. All of the above indicators were compiled and systematised in tables, on the basis of which the analysis was carried out.

Results of the study and discussion. First- to third-year female students at Krasnoyarsk State Agrarian University participated in the research, with a sample size of 180 people. The average age of first-year students was 17.5±0.5 (years), second-year students were 18.6±0.8 (years), and third-year students were 19.8±0.5 (years). During 2024–2025, an analysis of the dynamics of physical fitness and physical development of female students was conducted. The collected statistical data are presented in Table 1.

The collected and processed statistical data show that, in general, female students experience positive changes in physical fitness and physical development during their university studies. This allows us to conclude that systematic practical physical education classes at universities have an impact on the

Table 1. Dynamics of physical fitness and development indicators for female students in years 1–3 in the Siberian region (based on the example of Krasnoyarsk State Agrarian University)

Physical development and fitness indicators	Year, X ±			Increase in %	P
	1	2	3		
Body height, cm	166,6±4,2	167,3±4,4	168,7±4,2	1,3%	p<0,05
Body weight, kg	60,8±7,1	60,7±6,4	61,7±9,8	1,5%	p<0,05
Heart rate, at rest while sitting, bpm	83,8±9,8	83,5±8,8	83,3±9,8	-0,6%	p>0,05
Hand dynamometry, kg:	14,8±2,9	15,3±4,2	18,5±4,2	25%	p<0,05
Right hand: Left hand:	12,01±2,0	13,8±2,9	15,2±3,2	26,6%	p<0,05
Arm curls in a push-up position, number of repetitions	8,9±2,4	9,9±2,2	9,1±3,2	2,3%	p<0,05
Standing long jump, cm	152,8±12,1	159,1±12,5	157,6±8,6	3,1%	p<0,05
Sit-ups per minute from a lying position, number of repetitions	23,6±3,9	29,1±3,9	28,6±5,1	21,2%	p<0,05
2000 m run, min/sec	14.20±1.37	15.00±1.10	14.55±1.50	-2,5%	p>0,05
100 m run, sec	18,3±0,8	18,1±1,1	17,8±1,2	1,3%	p<0,05
Forward bend from a standing position, cm	6,1±2,77	5,7±2,9	8,3±3,2	36,1%	p<0,05

physical health of female students. At the same time, however, many indicators in female students develop on the basis of natural age-related physiological development, but this is insignificant and ranges from 1.5% to 2.5%. Thus, in order to enhance the process of physical development and fitness, it is necessary to improve the content of physical education programmes for female students in higher education institutions by introducing more modern forms and teaching technologies.

Conclusions. An analysis of the physical development and physical fitness of female students in their first to third years of study in the Siberian region (using Krasnoyarsk State Agrarian University as an example) showed positive growth: physical development increased by 13.6% ($p<0.05$) and physical fitness by 10.3% ($p>0.05$). At the same time, we see that these figures (3%–5%) reflect the natural biological growth and development of young organisms. In this regard, it is necessary to improve the content of physical education programmes based on modern methods and sports technologies, which will significantly enhance the pedagogical impact on the physical health of female university students.

References

1. Delovoy R.V., Ponomarev V.V., Ukolov A.V. Fizicheskaya podgotovlennost studentov agrarnogo universiteta. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2020. No. 4. Pp.30-31.
2. Ponomarev V.V., Rakovetskiy A.I. Sravnitelnaya harakteristika effektivnosti vozdeystviya razlichnyh programm fizicheskogo vospitaniya studentok vuza na ih fizicheskuyu podgotovlennost. Teoriya i praktika fizicheskoy kultury. 2018. No. 9. Pp. 12.
3. Ponomarev V.V., Kadomtseva E.M., Vorontsov P.G. Sovershenstvovanie praktiki fizicheskogo vospitaniya studentok na osnove sovremennyh fitnes-sredstv v vysshih uchebnyh zavedeniyah meditsinskogo profilya. Mezhkulturnaya kommunikatsiya v obrazovanii i meditsine. 2024. No. 2. Pp. 5-10.

Development of software and methodological support for an online platform for independent fitness training for master's students at physical education universities

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Abstract

Objective of the study is to develop an innovative teaching model that combines traditional and distance learning formats to optimise students' independent work and to justify the effectiveness of the software and methodological complex for the online platform.

Methods and structure of the study. The online platform and its software and methodological support were developed for the purpose of independent work by master's students studying in the field of 44.04.01 'Pedagogical Education', specialising in 'Fitness Technologies in Physical Culture' and 'Fitness Management in Physical Education'.

Results and conclusions. Requirements and methodological recommendations for the development of the online platform have been formulated, and its potential applications in the educational process for master's students have been revealed. Its role and effectiveness in the formation of professional competencies and practical skills when completing independent work assignments in the academic disciplines of this specialisation have been determined.

Keywords: *online platform, master's students, independent work, software, professional competencies.*

Introduction. Modern fitness in Russia is transforming from a highly specialised field into an important element of state health policy [2, 5, 6]. According to data from the Ministry of Sport of the Russian Federation for 2023 [4], the proportion of Russians who regularly engage in physical activity has reached 48%, while the fitness industry is showing annual growth of 12-15%, creating a demand for qualified specialists. In educational institutions of various types and kinds for preschoolers and schoolchildren, there is also a need to address health issues in both curricular and extracurricular physical education activities. In the context of digitalisation and post-pandemic trends, it is particularly important to train personnel capable of developing and implementing personalised fitness technologies that combine health, educational and motivational components.

However, despite high socio-economic demand, the system for training fitness specialists in Russia faces a number of problems:

- A shortage of practice-oriented training models. State standards for master's degrees (Federal State Educational Standards 44.04.01, 49.04.01) do not provide for a sufficient number of practical hours, which limits the development of professional competencies among master's students [3].

- Lack of integration of digital platforms. Traditional teaching methods do not provide the flexibility necessary to master innovative fitness technologies, such as biomechanical motion analysis or VR training [7].

- Increasing demands on specialists. Employers expect graduates to have not only knowledge in the field of training methods, physiology, pedagogy, and psychology, but also skills in working with digital tools (e.g., MyFitnessPal, WearOS trackers) and managing fitness projects [1].

Resolving these issues determined the objectives of our study..

Objective of the study is to develop an innovative teaching model that combines traditional and distance learning formats to optimise students' independent work and to justify the effectiveness of the software and methodological complex for the online platform.

Methods and structure of the study. An online platform was developed to automate the monitoring of master's students' independent work (adaptive tests, training programme simulators). virtualisation of practical training through the simulation of exercise techniques and the creation of case studies for practical application; personalisation of training based on AI data (progress analysis, recommendations for development trajectories). The study used: analysis of scientific and methodological literature, video programmes, questionnaires, expert assessment, and self-assessment. The study was conducted at the Institute of Physical Culture and Sports (IFCS). First- and second-year full-time and part-time master's students from different fields of study took part in the study.

Results of the study and discussion. One of the prerequisites for developing the online platform was the federal project 'Digital Educational Environment,' whose main task is to create and implement it in educational organisations. Social networks can be a powerful motivational tool: students can share their achievements, find like-minded people, and participate in challenges.

The following tasks were set for the development of the platform: to develop an online platform based on existing resources and encourage students to engage in independent fitness activities; to develop video programmes, creative and methodological tasks and implement them in the educational process; to determine the effectiveness of the online platform for the development of professional competencies.

A survey of 405 students determined the relevance of developing an online platform for independent work (for 93.5% of respondents).

The platform development process consisted of several stages, presented in Table 1.

To ensure the effectiveness and safety of video classes, the following key factors must be taken into account:

Technical recording parameters: video resolution – no less than 1080p (Full HD) with a frame rate of 60 frames per second; use of automatic white balance and autofocus mode; use of an external microphone to improve sound quality.

Methodological requirements for exercises: selection of exercises adapted to limited space and lack of specialised equipment; exclusion of movements with high amplitude and increased risk of injury to minimise potential damage.

Structure of the video lesson: introductory part (preparation of the space); preparatory, main and concluding parts.

Role of the instructor: demonstration of the correct technique; correction of typical mistakes; inclusion of breaks for rest between exercises.

Table 1. Platform development stages

Stage	Topic	Actions
1	Target audience research	Survey of students, analysis of existing platforms and video lessons
2	Concept and functionality definition	Formulation of platform goals, development of video lessons, useful information about teaching methods, healthy lifestyles, recommendations on nutrition and self-monitoring of physical activity
3	Platform selection for development	Evaluation of various website builders and platforms (Tilda) to select the most suitable one
4	Design development	Selection of colour palette, fonts and visual elements, creation of page layouts
5	Content creation	Collection and preparation of materials, including the development of video lessons, articles on fitness, advice on exercise techniques, etc.
6	Development and programming	Creation of a website on the selected platform, integration of all necessary functions and content; testing functionality (video players); optimising the website for different devices (mobile and computer versions)
7	Platform launch	Conducting an advertising campaign for students and faculty
8	Feedback collection and performance improvement	Obtaining feedback from users; adding regular updates, new content and features

To determine the demand for fitness programmes, a survey was conducted among IFCS bachelor's (3rd–4th year) and master's (1st–2nd year) students. Participants chose their most preferred areas from 20 options (Figure 1).

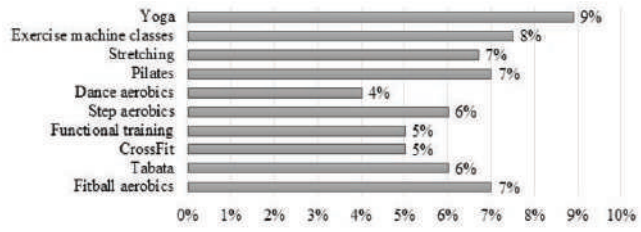

Figure 1. Selection of fitness programmes by IFCS master's students for independent training

As part of the study, a specialised online platform was developed, supplemented by a set of software and methodological tools aimed at optimising the educational process. The proposed solution includes the necessary set of components for the effective functioning of the system, in accordance with the requirements of Federal State Educational Standards for Higher Education 3++. The developed teaching and methodological materials are intended for master's programmes at higher education institutions.

Scientific novelty. The necessity of introducing hybrid educational technologies that contribute to the development of digital intelligence and strategic thinking in future specialists in the field of physical culture and fitness is substantiated.

The software and methodological complex includes a theoretical and methodological justification of fitness, including historical analysis and experimental confirmation of its effectiveness, algorithms for the introduction of fitness technologies into the physical education system, aimed at improving physical fitness, forming an interest in healthy lifestyles and strengthening the health of various age groups.

The launch of the platform was accompanied by the creation of 19 video lessons, which attracted more than 100 users in 6 months. An analysis of engagement showed that yoga and posture correction classes were the most popular. The results of the survey (n=30) indicate a high level of user satisfaction:

- 75% of respondents expressed their willingness to continue learning in video format;
- 57% preferred the online platform for independent study;
- 73% rated the navigation as convenient;
- 70% noted satisfactory sound and video quality;
- 81% supported the idea of notifications about new training sessions.

During a three-month study to test the developed platform (n=30, master's students at the IFCS of Herzen State Pedagogical University), the results of the control group (CGn=14, traditional methods) and the experimental group (EGn=16, training using the platform) were compared. Self-assessment of professional competencies (10-point scale) prior to the experiment did not reveal any significant differences ($p>0.05$). After completing the training, the EG showed an increase in indicators of 51.02%, while the CG showed an increase of 31.9% ($p\leq0.05$), confirming the effectiveness of the proposed approach. After the experiment, the formation of skills was determined both on the basis of the self-assessment of master's students and expert assessment (teachers with at least 10 years of work experience).

The results confirm the effectiveness of the developed platform both for the formation of professional competencies in the EG and for increasing the objectivity of self-assessment. Thus, in the EG, self-assessment practically coincides with the opinion of experts,

Table 2. Comparison of the results of the formation of professional competencies of IFCS students after the experiment (based on self-analysis and expert assessment)

Average professional competence indicators	CG (average score) (M±m)	EG (average score) (M±m)	t em	p
Knowledge in the field of fitness and health training (self-assessment)	7,23± 0,36	8,6± 0,4	5,4	< 0.05
Skills in conducting classes in various areas of fitness (self-assessment)	8±0,31	8,69±0,42	3,6	< 0.05
Skills in conducting classes in various areas of fitness (expert assessment)	6,85±0,54	8,6±0,4	4,3	< 0.05
t cr=2,048				

while in the CG, expert assessment is significantly lower than the self-assessment of master's students (Table 2).

The results of the study demonstrate the potential of the developed platform for integrating hybrid learning into the training system for physical education and fitness specialists.

However, despite all the positive results obtained, it is possible to highlight some shortcomings and areas of risk that still need to be addressed. These include: the lack of automated control over exercise technique; the need to integrate medical data for personalised training; dependence on additional equipment (fitness trackers) and their quality; the risk of reduced socialisation due to the digital format, as the app cannot replace human communication, the exchange of experiences and emotions; many apps are cluttered with advertisements, spam, notifications, etc. This requires further research in the field of optimising the combination of traditional teaching and new formats of software and methodological support, as well as the use of online platforms.

Conclusions. The developed platform and accompanying methodology are designed to improve the quality of the educational process and independent work of master's students (in the areas of 'Fitness Management in Physical Education' and 'Fitness Technologies in Physical Culture'), strengthen motivation and stimulate a creative approach to practical tasks, and promote the implementation of government initiatives to involve the population in physical exercise (the target is 90% of children and 70% of the adult population by 2030). In addition, the platform helps to overcome the shortage of personnel in the fitness industry and creates the conditions for the export of Russian fitness methods to CIS countries.

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References

1. Analiticheskiy otchet: Trebovaniya rabotodateley k fitness-spetsialistam v 2023 godu. HeadHunter. Moskva, 2023. 28 p.
2. Grudnitskaya N.N. Kompetentnostnyy podkhod v prepodavanii fitnesa. Fizicheskaya kultura i sport: integratsiya nauki i praktiki: mater. XIII mezhdunar. nauch.-prakt. konf., Stavropol, 05 oktyabrya 2016 goda. Stavropol: Izd-vo SKFU, 2016. Pp. 62-63.
3. Ivanov A.A., Petrova V.M. Sovremennye problemy podgotovki magistrov v oblasti fitness-tekhnologiy. Teoriya i praktika fizicheskoy kultury. 2022. No. 5. Pp. 12-18.
4. Ministerstvo sporta Rossiyskoy Federatsii. Doklad o razvitii fizicheskoy kultury i massovogo sporta v RF v 2022-2023 gg. Moskva, 2023. 45 p.
5. Saykina E.G. Fitnes v sisteme doshkolnogo i shkolnogo fizkulturnogo obrazovaniya: dis. ... dokt. ped. nauk. Sankt Peterburg, 2009. 560 p.
6. Saykina E.G., Smirnova Yu.V. Kontseptualnye osnovy fitnesa v teorii i praktike fizicheskoy kultury. Sovremennye problemy nauki i obrazovaniya. 2019. No. 2. Pp. 38.
7. Petrov S.K. Digital Transformation in Fitness Education: VR and AI Integration. International Journal of Sports Science. 2021. V. 15. No. 3. Pp. 45-52.

Digital technologies in physical education of students: experience using a mobile application

UDC 796:004

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Abstract

Objective of the study is to examine the impact of using mobile applications and wearable devices on students' motivation for physical education classes.

Methods and structure of the study. An anonymous survey was conducted among students to determine their attitude towards such technologies in the educational environment, the frequency of their use, as well as their influence on motivation for physical activity.

Results and conclusions. The results showed a positive dynamic in students' engagement with an active lifestyle when using digital technologies (activity trackers).

Keywords: *students, physical education, mobile applications, fitness tracker, health.*

Introduction. The active integration of digital technologies into all spheres of life, including education, has become an integral part of modern society. The use of mobile applications and wearable devices in the physical education of students is becoming increasingly relevant due to their widespread adoption and potential to increase motivation for physical activity. Many students already use such applications to track their activity throughout the day, which opens up new opportunities for integrating these tools into the educational process. One of the most acute challenges of our time is physical inactivity, as it is directly linked to increased time spent in a sedentary position (work, study, time at the computer), as well as the widespread prevalence of low-mobility activities, especially among the younger generation [1,2].

In this context, mobile applications and wearable devices (smartwatches, fitness trackers) provide users with the ability to track step count, heart rate, and other biomarkers, as well as set individual daily activity goals and receive motivational notifications. These tools are becoming a key tool in the fight against physical inactivity, as they not only allow for the recording of physical activity data but also have the ability to encourage regular activity, contributing to daily physical well-being [3,4].

Of particular interest are visualized goal-setting and achievement systems, such as "activity rings" and "daily norms," which are widely featured in popular digital platforms such as Apple Health, Google Fit, Huawei Health, Samsung Health, and others. These services engage users through gamification, thereby fostering a sense of competition and promoting self-control. As a result, regular exercise becomes not an obligation but a part of the daily routine.

Nevertheless, in the Russian practice of physical education, the use of such digital solutions remains an exception, as their application is limited and not sys-

tematized. However, the potential of such technologies for forming and maintaining an active lifestyle, especially among students, is evident. This is particularly relevant considering that the level of physical activity among young people is often unstable and requires additional support [4, 5].

In light of the growing interest in a healthy lifestyle and digital technologies, it is important to analyze how students respond to such digital solutions and to what extent they can truly influence their daily physical activity. To obtain a more complete picture, it is necessary to refer to the results of previous studies, both domestic and foreign [6].

Thus, foreign research confirms the effectiveness of using mobile applications and wearable devices for increasing the level of physical activity.

Objective of the study is to examine the impact of using mobile applications and wearable devices on students' motivation for physical education classes.

Research objectives:

1. To study publications dedicated to the topic of the influence of digital technologies on the level of physical activity and physical education of the individual.

2. To conduct a survey among students to identify their attitude towards digital technologies and wearable devices in the context of their physical education, as well as their perspective on integrating such devices into the educational environment.

Methods and structure of the study. The experiment involved 100 students of 1st-3rd years. All respondents used mobile applications and/or wearable devices to track physical activity at various levels: from beginners to active users.

Research Methodology: The study was conducted through anonymous questionnaires, consisting of 20 closed-ended questions, divided into two blocks: level of awareness and frequency of use of digital technologies; general well-being and attitude towards the integration of digital technologies into physical education. The answers were analyzed to identify dependencies between the frequency of technology use, student motivation, and their perception of data visualization, as well as to assess readiness for integrating digital tools into the educational process.

Results of the study and discussion. In the first block of the study, questions concerning awareness and frequency of use of applications and wearable devices for tracking physical activity were considered. Analysis of the answers showed that almost all participants (88%) own smartphones with installed applications for tracking physical activity. Regularly use (Fig.1) such applications 63% of respondents, 25% - have an application but hardly use it, 7% - have not installed one but want to try, 5% - are not interested.

Such results indicate a high degree of prevalence of these technologies for activity monitoring.

The use of smartwatches/fitness trackers turned out to be slightly less widespread; for example, only 43% of respondents use a device constantly, 22% - from time to time, while 26% - do not use but want to purchase one, and 9% do not plan to use them at all. These responses show that wearable devices remain a desirable but not mandatory tool for activity tracking.

Regarding tracking daily steps, the results were as follows: the majority of students (63%) track their steps daily, while 17% do so several times a week, 7% use it even less frequently, and 13% do not use it at all. The answer to the question about how many steps per day the respondents take is presented in Fig. 1.

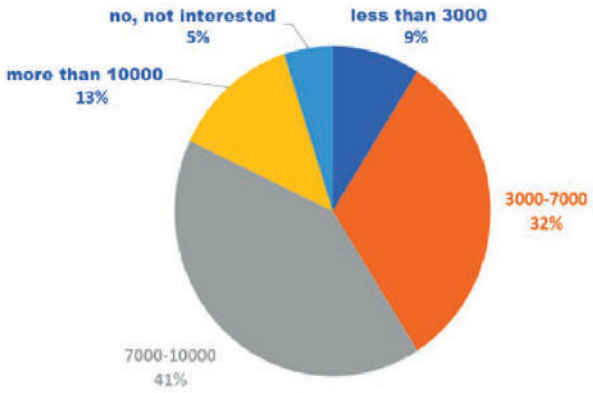

Fig. 1 - Results of the question "How many steps per day do you take?"

Interestingly, almost a third of participants (32%) take from 3000 to 7000 steps daily, and 41% - from 7000 to 10000, thus approaching the recommended activity standards of the World Health Organization. It is also noteworthy that only 13% of respondents confidently exceed the 10000-step mark daily, thereby demonstrating a high level of physical activity. However, at the same time, 9% of respondents' report taking less than 3000 steps per day, indicating their sedentary lifestyle. The remaining 5% found it difficult to assess their daily activity as they do not keep regular count. Thus, it turns out that despite the widespread use of applications for activity monitoring, achieving optimal daily step counts remains a task not accomplished by all participants.

Regarding the use of additional functions in applications (reminders, goals, workouts), the answers were as follows: 42% - actively use them, 30% - apply them from time to time, 20% - are aware of the functions but ignore them, and 8% - heard about them for the first time. From this, it can be concluded that engagement with the applications' functionality still has room for growth, as not all users utilize the available tools to the maximum.

In the second block, the focus of the questions was directed at how regular physical activity and the use of digital tools affect the general well-being and emotional state of students.

When asked whether students feel an improvement in physical condition with regular exercise, 59% answered that the effect is clearly noticeable, another 28% noted minor improvements, and 13% saw no changes. Regarding mood, 52% of students reported that after physical activity, their mood always improves, 36% feel a mood boost only sometimes, 8% - rarely, and 4% do not notice any changes.

Regarding the influence of "closing rings" or achieving goals on emotional state, the results were as follows: 41% of respondents admitted experiencing satisfaction upon achieving goals, 34% noted a slight improvement in mood, 20% felt no changes, and 5% stated that such control irritates them. Feelings of guilt for not completing a daily activity goal often arise in 22% of students, sometimes - in 37%, while 28% are calm about it, and 13% do not set such tasks for themselves at all. On the final question about including digital activity tracking in the university physical education curriculum, opinions were divided: 36% of respondents supported the idea, considering it interesting and modern, 40% spoke in favor of its use as an additional element, 15% would rather not have such elements, and only 9% prefer a completely classical approach without digital technologies.

Conclusions.

1. The level of digital awareness among students regarding activity monitoring applications is quite high, as the majority of respondents use these applications, and more than half have made step counting a habitual part of their day. At the same time, wearable devices are currently less prevalent than smartphones.

2. Physical activity positively affects not only the physical condition but also the emotional well-being of students. Digital elements, such as tracking goals and progress, are capable of enhancing motivation and improving mood; however, their influence is individual.

The use of trackers by students is widespread, but achieving recommended activity norms remains unstable, and not everyone utilizes advanced application functions (goals, reminders, etc.) The integration of digital technologies into educational programs should be considered a promising direction, but it is important to consider that not all students are ready for digital monitoring.

References

1. Belmach V., Grigan S., Vishina A. Planing of the educational and training process taking into account the accelerated psychophysiological recovery of athletes using digital technologies. E3S Web of Conferences. 14th International Scientific and Practical Conference on State and Prospects for the Development of Agribusiness, INTERAGROMASH 2021. Rostov-on-Don, 2021. Pp. 09032.
2. Grigan S.A., Butenko T.V., Na Gornykh V.N., Tokarev G.N. The use of digital materials in physical education lessons for students assigned to a special medical group. Theory and Practice of Physical Culture. 2025. No. 4. Pp. 66-68.
3. Grigan S.A., Belmach V.A. The Impact of Information Technology Application on the Physical Activity of Students of a Technical University. Scientific Notes of P.F. Lesgaft University. 2024. No. 2(228). Pp. 46-49.
4. Grigan S.A., Butenko T.V., Nagornykh V.N., Tokarev G.N. Ispolzovanie tsifrovogo kontenta pri organizatsii zanyatiy po fizicheskoy kulture dlya studentov spetsialnoy meditsinskoy gruppy. Teoriya i praktika fizicheskoy kultury. 2025. No. 4. Pp. 60-62.
5. Grigan S.A., Zavodny N.A., Gailomazova E.S. Vozmozhnosti onlayn-obucheniya studentov sportivnogo vuza v aspekte sotsiologicheskogo analiza. Teoriya i praktika fizicheskoy kultury. 2022. No. 3. Pp. 63.
6. Kiryanova L.A., Markov D.A. Physical culture as the most important factor in the formation of a comprehensively developed personality. Theory and Practice of Physical Culture. 2025. № 4. С. 93-95.

A systematic approach to the activities of a regional football federation (using the example of Krasnoyarsk Krai)

UDC 796

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Abstract

Objective of the study is to develop an algorithm for designing a systematic approach to the activities of a regional football federation (using the Krasnoyarsk Krai as an example) and to recommend its implementation in practice.

Methods and structure of the study. The study was conducted at the Krasnoyarsk Regional Football Federation between 2022 and 2024. The following research methods were selected to ensure the correct organization and implementation of scientific and theoretical work: analysis of scientific and methodological literature on the topic; questionnaires; interviews, observation, modelling; systematization; abstraction; testing, expert assessment, mathematical statistics, etc. In the process of collecting factual material, 150 coaches and specialists involved in the development of football in the region, as well as more than 800 children and young people who are systematically involved in football, were involved. All this contributed to identifying the overall level of activity of the regional federation and designing a systematic approach to improving the functioning of regional football.

Results and conclusions. The theoretical research conducted contributed to the development of an algorithm for designing a systematic approach to the activities of a regional football federation, as well as a systematic analysis of the federation's functioning; an experimental structure and content of a model for improving the activities of the existing regional football federation, based on taking into account the current requirements for the development of the football industry in the region, Russia and in global practice.

Keywords: *regional football federation, systematic approach, activity, design, improvement.*

Introduction. A systematic approach was used as the theoretical basis for improving the activities of the regional football federation (using the Krasnoyarsk Territory as an example). A systematic approach involves considering the object of study as a holistic system that includes a set of elements that together perform a specific function (activity). The following principles of the systematic approach were applied when developing the structure and content of the program for improving the activities of the regional football federation: integrity, hierarchy and structuring. The improvement of the activities of the regional football federation, based on a systematic approach, included the following algorithm: definition of basic management blocks and their tasks; a consistent structure of interaction between management blocks and a functioning process, including quantitative and qualitative performance indicators, was developed; corrective and effective blocks of the federation's activities were formed. The systematic approach to improving the activities of the regional football federation (using the example of the Krasnoyarsk Krai) was developed and designed in this methodological sequence.

Objective of the study is to develop an algorithm for designing a systematic approach to the activities of a regional football federation (using the Krasnoyarsk Krai as an example) and to recommend its implementation in practice.

Methods and structure of the study. The study was conducted at the Krasnoyarsk Regional Football Federation between 2022 and 2024. The following research methods were selected to ensure the correct organization and implementation of scientific and theoretical work: analysis of scientific and meth-

odological literature on the topic; questionnaires; interviews, observation, modelling; systematization; abstraction; testing, expert assessment, mathematical statistics, etc. In the process of collecting factual material, 150 coaches and specialists involved in the development of football in the region, as well as more than 800 children and young people who are systematically involved in football, were involved. All this contributed to identifying the overall level of activity of the regional federation and designing a systematic approach to improving the functioning of regional football.

Results of the study and discussion. Based on the results of the study, a model for designing a systematic approach to the activities of the regional football federation was developed (Fig. 1).

Figure 1 shows the stages of a systematic approach to developing organizational and methodological support for improving the activities of a regional football federation (using the Krasnoyarsk Krai as an example).

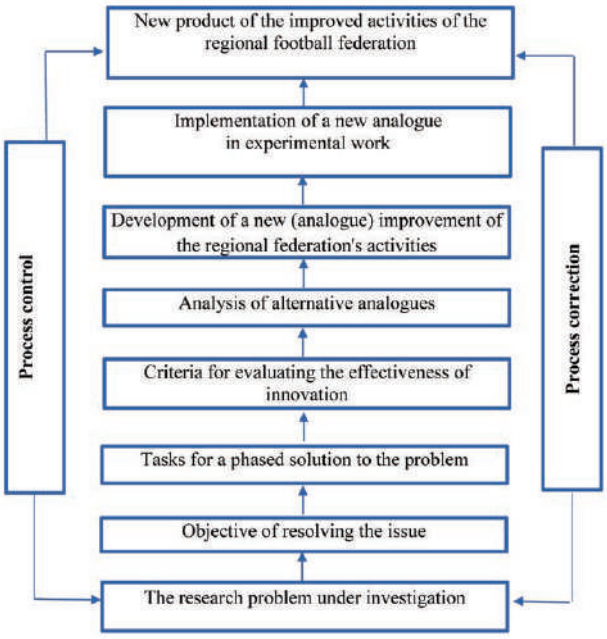

Fig. 1. Model for designing a systematic approach to improving the activities of a regional football federation.

Table 1 – Performance indicators for football federations: Europe (generalized, average), RFU (Russia) and the Krasnoyarsk region.

Performance indicators of football federations	Football Federation		
	Europe (generalized, average)	Russia (RFU)	Krasnoyarsk Regional Federation
The mentality formed towards football among the population, in %	From 90% and above	Less than 20%	Less than 15%
The place (position) of football in the country, number	1st-3rd place	10th place	9th place
Football infrastructure provision (logistics), in %	90% and above	30 %	20 %
Availability of competent coaches and football specialists, in %	100 %	10 %	6 %
Provision of national teams with competent footballers, in %	100 %	25 %	10 %
Provision of competent referees for football competitions of various levels in the country	100 %	10 %	7 %
Funding for football activities at the state level, in %	40 %	30%	10 %
sponsorship	20 %	2 %	0,5 %
own financial and economic activity	40 %	0 %	0 %
Quality of training systems in football from children's sport to professional activity (career), in %	100 %	25 %	15 %
Functioning of state programs for the development of football in the country, number	Over 50	10-15	8-12
Total number of people playing football as a percentage of the total population	From 50% and above	1,5 %	1 %
The legislative framework for football development (football constitution) is in force.	Yes	No	No
Football business and management is functioning	Yes	No	No
Climatic and geographical conditions for year-round football activities, in %	90% and above	40 %	20 %

The presented model for designing a systematic approach to improving the activities of the regional football federation includes seven functional blocks that progressively form the goal, objectives, and scientific and methodological tools for achieving them.

Table 1 presents comparative indicators of the activities of football federations: Europe, the Russian Football Union, and the Krasnoyarsk Regional Federation.

A general analysis of the activities of football organizations in Europe, Russia (RFU) and the Krasnoyarsk region revealed the main problems hindering the development of football in Russia and what needs to be done to bring the football industry up to European standards.

Conclusions. The developed algorithm of a systematic approach to improving the activities of the regional football federation allows specialists and managers to quickly and effectively adjust and manage the football industry, both at the regional level and in Russia as a whole.

References

1. Sazontov M.D., Ponomarev V.V. Osobennosti deyatelnosti futbolnyh federatsiy Evropy v aspekte teoreticheskogo analiza. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2020. No. 4. Pp. 81-82.
2. Sazontov M.D., Ponomarev V.V. Otnoshenie k sportivnoy deyatelnosti molodyh futbolistov Sibirskogo Federalnogo okruga. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2021. No. 4. Pp. 33-34.
3. Sazontov M.D., Ponomarev V.V., Evtushenko V.P., Smirnov S.V. Pedagogicheskiy analiz deyatelnosti trenerov po futbolu molodezhnyh komand Sibirskogo Federalnogo okruga. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2021. No. 5. Pp. 45-46.
4. Sazontov M.D., Abramchenko D.A., Ponomarev V.V. Organizatsionno-metodicheskoe sopro-vozhdenie deyatelnosti regionalnoy federatsii po futbolu. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2022. No. 5. Pp. 74-77.

Organizational model based on an integrated approach to encouraging students in physical education and sports activities at the university: a theoretical aspect

UDC 376.1:378

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Abstract

Objective of the study is to substantiate and develop an innovative model based on a comprehensive approach to encouraging students to participate in physical education and sports activities at university and to recommend its implementation in practice.

Methods and structure of the study. The study was conducted at Siberian Federal University between 2023 and 2025. It analysed mass sports and physical education and health activities among students at the university, as well as at other higher education institutions in the Krasnoyarsk Krai.

Results and conclusions. Analytical and statistical work has shown low activity and participation of the region's student youth in physical education and sports events.

Keywords: *organisational model, comprehensive approach, activation, student youth, university, physical education and sports activities.*

Introduction. The student youth is the foundation of the physical culture and sports movement in the country. The President of the Russian Federation, V.V. Putin, and the Government of the country have set tasks for the Ministry of Sport and other public organisations and departments to attract up to 80% of students enrolled in educational institutions to systematic physical culture and sports activities. In order to increase the popularity of physical culture and sports among students in the country's universities, a comprehensive approach to organising students for active physical education classes is necessary. The need to develop a comprehensive organisational model for activating students to participate in systematic physical culture and sports activities was the subject of this work.

Objective of the study is to substantiate and develop an innovative model based on a comprehensive approach to encouraging students to participate in physical education and sports activities at university and to recommend its implementation in practice.

Methods and structure of the study. The study was conducted at Siberian Federal University between 2023 and 2025. It analysed mass sports and physical education and health activities among students at the university, as well as at other higher education institutions in the Krasnoyarsk Krai. In addition, the following scientific and theoretical work was carried out: questionnaires, interviews, pedagogical observations; the total number of physical education and sports events, the number of students who took part, the types of sports and physical education and health events, etc. in the region's universities were analysed. The collected factual material helped to reveal the overall picture of the physical culture and sports movement among students in higher education institutions in the Krasnoyarsk Krai.

Results of the study and discussion. The analytical and statistical work carried out showed low

activity and participation of students in the region in physical culture and sports events. Of the total number of full-time students in the Siberian region (43,700), only 2,300 students (5.3%) actively participate in various mass physical culture and sports events; Of the 16 universities in the region, eight (50%) participate in the Universiade. The Universiade programme has been reduced from 30 to 20 sports competitions (by 33%). The academic discipline of 'Physical Education' is taught in universities only up to the second year, while at the same time there is low student attendance at practical classes, etc. These basic statistical indicators point to the need to reform the current system of encouraging students to participate in mass physical education and sports events in the region and to develop innovative organisational models for motivating young people to engage in physical education and sports in the university environment. This should be based on a comprehensive approach, which involves a thorough examination of the problem for its further resolution through the integration of quantitative and qualitative methods, means, forms and technologies for encouraging students to participate in physical education and sports activities in the region.

Figure 1 shows an organisational model based on a comprehensive approach to encouraging students to participate in physical education and sports activities in the university environment.

Conclusions. The theoretical content of the organisational model, developed on the basis of a comprehensive approach to encouraging students to participate in physical education and sports activities at universities, includes six basic components: intra-university activities; regional Universiade competitions; mass All-Russian events; GTO Starts; Russian student championships in various sports; and reports from university rectors on students' physical education and sports activities.

Only such a comprehensive approach will contribute to the solution of an important task for the state, namely, the mass involvement of students in diverse physical education and sports activities in the country.

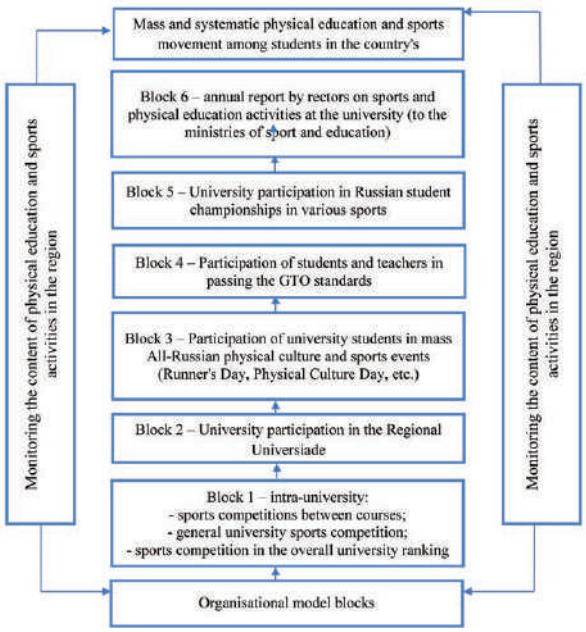

Figure 1 – Blocks of a comprehensive organisational model for encouraging students to participate in physical education and sports activities at university.

References

Doroshenko S.A., Ponomarev V.V. Sportivno-vidovoy podkhod v fizicheskom vospitanii studentov v vuze: monografiya. Krasnoyarsk: SibGTU, 2010. 178 p.

Kharitonov D.A., Ponomarev V.V. Nastolnyy tennis v fizicheskom vospitanii studentov Sibirskogo regiona. Fizicheskaya kultura: vospitanie, obrazovanie, trenirovka. 2025. No. 5. Pp. 74.

Kharitonov D.A. Analiz fizkulturno-sportivnoy deyatelnosti studencheskoy molodezhi v vuzakh Sibirskogo regiona (Krasnoyarskiy kray). Sbornik: Razrabotka kontseptsii i chastnykh aspektov professionalno-prikladnogo razdela fizicheskoy kultury. Materialy 77-oy Vserossiyskoy studencheskoy nauchno-prakticheskoy konferentsii, posvyashchennoy 150-letiyu so dnya rozhdeniya A.G. Doyarenko. Moskva. 2024. Pp. 67-69.

Kharitonov D.A., Ponomarev V.V. Physical and sports activities of students of universities in eastern Siberia (Krasnoyarsk region): analytical aspect. Theory and Practice of Physical Culture. 2024. No. 5. Pp. 68-70.

The transformation of positivist knowledge in the master's degree programme in the sociology of physical culture and sport

UDC 796

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Abstract

Objective of the study is to theoretically substantiate the contemporary transformation of positivist knowledge in the master's professional educational programme in the sociology of physical culture and sport.

Methods and structure of the study. The organisation and methods of the study are based on a sequential comparative analysis of, on the one hand, the positivist and, on the other hand, the neopositivist and postpositivist versions of the theoretical and methodological basis of the master's professional educational programme in the sociology of physical culture and sport.

Results and conclusions. This research paper provides a comparative analysis of the positivist and neopositivist/postpositivist theoretical and methodological foundations of the master's professional educational programme in the sociology of physical culture and sport.

It is shown that the transition of applied sociology to a neo-positivist and post-positivist theoretical and methodological version or platform is due to the following objective reasons:

– numerous terminological and contextual contradictions due to the extensive conceptual apparatus and abstract philosophical theorising of science;

– the development of digital technologies based on high-level data analysis methods;

– bringing specialised applied sociological science and the professional educational model into line with the modern demands of society.

Keywords: *master's programme, philosophy of physical culture, positivism, neopositivism, postpositivism.*

Introduction. A decade after the state accreditation of the master's programme in sociology of physical culture and sport at the Russian University of Sport «GTSOLIFK», the problem of finding new theoretical, methodological, and methodological-technological foundations for teaching this discipline in physical culture and sports universities has become more pressing.

Objective of the study is to theoretically substantiate the contemporary transformation of positivist knowledge in the master's professional educational programme in the sociology of physical culture and sport.

Methods and structure of the study. The organisation and methods of the study are based on a sequential comparative analysis of, on the one hand, the positivist and, on the other hand, the neopositivist and postpositivist versions of the theoretical and methodological basis of the master's professional educational programme in the sociology of physical culture and sport.

Results of the study and discussion. The paradigm of the fundamental theoretical and methodological principles and tenets of Auguste Comte's positivism and other philosophising representatives of 19th-century Western European sociology includes:

– the assertion of the objective necessity to abandon metaphysical abstract and idealised construction and typology – with an endless stream of newly created abstract-ideal metaphysical constructions;

– the assertion of the expediency of using mechanical, physical, biological, psychological, historical-ethnographic, and anthropological research tools to develop sociological analysis itself – given the real situation of the general underdevelopment of the latter;

– the assertion of the fundamental importance of the observation method for sociological research – given the naturally insufficient attention paid to other methods of empirical research, partly due to the underdevelopment of the latter;

– the rigid division of sociology into theoretical and empirical, and its methods into theoretical and empirical, characteristic of the paradigm of classical science (classical mechanics);

– the recognition of inductive and generalising methods of transferring the truth of the particular to the truth of the general as inadmissible for rational-logical criterion analysis (e.g., using the rules of the "logical square");

– formal and factual defence of the principle of orientation towards the process of evolutionary development of modern society, reflected in the principle of recognition of evolutionary change and development of sociological knowledge;

– Contrary to the principle of unambiguous interpretation of scientific terms, caused by numerous different approaches to defining the subject of sociology, there is a widespread practice of ambiguous interpretation of identical sociological concepts, such as social structure, social system, social institution, socialisation, and others.

– the use, on the one hand, of the principle of accumulation and, on the other, of the principle of verification of theoretical sociological knowledge, which fosters a tendency towards the dogmatisation of sociological knowledge despite all its internal contradictions [1, 3, 8-10].

The modern paradigm of sociological science, based on neopositivist and postpositivist theoretical and methodological foundations, is critical of the cumulative and verification model of mandatory sequential study and analysis of all abstract, generalised and idealised metaphysical constructs in sociology, starting from the moment of its emergence. It draws the attention of scholars to the need for a fundamental revision of the entire traditional sociological conceptual apparatus, as well as the development and use of software-based and practically oriented models of applied concrete sociological research, considering them to be the only scientific ones capable of revealing social facts, i.e., deep private social patterns [1-12].

The modern principles and provisions of the contemporary paradigm of sociological science include:

– justification of the regularity of alternating evolutionary and revolutionary periods in the development of science, as well as the mechanism of changing 'scientific paradigms' or 'disciplinary matrices' (Thomas Samuel Kuhn's concept); the regular mechanism of competition and 'progressive shift' in the field of research programmes (Imre Lakatos' concept); justification of the principle of falsification of scientific theories as a rejection of the positivist principle of their verification (Karl Popper's concept);

– recognition of different goals, conditions and criteria for organising pilot, descriptive and analytical types of concrete sociological research;

– recognition of the expediency of using four basic types of concrete sociological research (using the methods of document analysis, survey, observation and experiment). Moreover, in the unity of quantitative and qualitative possibilities of applying these methods;

– recognition of the coexistence of three leading sociological schools and their inherent theories: structural-functional analysis (Tollcott Parsons and Robert Merton), social conflict (Ralf Dahrendorf), symbolic interactionism (George Herbert Mead);

– the requirement to base the development of all types of concrete sociological research programmes on a synthesis of mathematical, logical and linguistic modelling (the concepts of Rudolf Carnap, Ludwig Wittgenstein and Bertrand Russell).

Taken together, all of the above principles and provisions give sociology the image of an exact science, granting it the status of 'social mathematics.' The image of sociology as social mathematics in digital sociology is reinforced and deepened by the use of mathematical graph theory and graph modelling, becoming increasingly clear and prominent as the processes of datafication, algorithmisation, platformisation and networkisation of digital culture and digital society develop.

Conclusions. The transition of applied sociology and the master's professional educational programme in the sociology of physical culture and sport from a positivist to a neo-positivist and post-positivist theoretical and methodological version or platform is due to the following objective reasons:

– numerous terminological and contextual contradictions due to the extensive conceptual apparatus and abstract philosophical theorising of science;

– the development of digital technologies based on high-level data analysis methods;

– bringing specialised applied sociology and the professional educational model into line with the modern demands of society.

References

1. Vagner P. Sotsiologiya. Istoriya chelovechestva XX vek. T.VII. UNESCO, Izdatelskiy Dom MAGISTR-PRESS, 2005. Pp. 271-275.
2. Galanina K.E. Transformatsiya kontsepta subekta v filosofii Lyudviga Vitgenshteyna. Voprosy filosofii. 2011. No. 7. Pp. 138-147.
3. Giddens E. Sotsiologiya. Per. s angl. Izd. 2-e, polnostyu pererab. i dop. Moscow: Editorial URSS, 2005. 632 p.
4. Danilov A.N., Elsukov A.N. Metodologicheskoe uchenie V. Pareto i ego idei o nauchnom statuse sotsiologii. Voprosy filosofii. 2010. No. 8. Pp. 143-154.
5. Letov O.V. Problema nauchnoy obektivnosti v postpozitivistskoy filosofii. Voprosy filosofii. 2011. No. 12. Pp. 57-62.
6. Mihaylov V.V. Filosofskie problemy sotsialno-gumanitarnyh nauk: fragmenty po istorii i filosofii nauki: uchebnoe posobie. Moskva, 2009. 50 p.
7. Pahomov B.Ya. Problema induktsii: Karl Popper i Imre Lakatos. Voprosy filosofii. 2009. No. 11. Pp. 123-132.
8. Peredelskiy A.A., Markin E.V., Konikov S.L. Istoriya i filosofiya nauki, sotsiologiya i psihologiya kak teoretiko-metodologicheskie osnovaniya postroeniya gipotetiko-deduktivnyh teoriy i provedeniya konkretno-sotsiologicheskih issledovaniy v oblasti fizicheskoy kultury i sporta: nauchnaya monografiya. Orel: izd-vo Kartush, 2022. 232 p.
9. Peredelskiy A.A. Filosofiya sporta. Metanauchnye osnovaniya sportivnogo protsessa. Moskva: Izdatelskiy Dom MAGISTR-PRESS, 2011. 480 p.
10. Peredelskiy A.A. Fizicheskaya kultura i sport v otrazhenii filosofskih i sotsiologicheskih nauk. Sotsiologiya sporta: Uchebnik. Moskva: Sport, 2016. 416 p.
11. Pirozhkova S.V. Problema nauchnogo predvideniya v filosofii K. Poppera. Voprosy filosofii. 2009. No. 6. Pp. 160-176.
12. Surovtsev V.A., Wittgenstein L. Logiko-filosofskiy traktat Vasiliyu Vasilevichu Sokolovu. Voprosy filosofii. 2009. No. 9. Pp. 183-189.

Features of the development of running tourism in Russia based on the example of the ‘Pharmeco – Running along the Golden Ring’ project

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Abstract

Objective of the study is to identify the characteristics of the development of running tourism in Russia, using the example of the series of mass runs ‘Pharmeco – Running along the Golden Ring’.

Methods and structure of the study. An analysis and summary of data from specialised and scientific-methodological literature has been conducted.

Results and conclusions. The first running tourism project in Russia was a series of races called ‘Pharmeco – Running along the Golden Ring’. The races take place in cities along the popular Golden Ring tourist route and in other cities in central Russia that have preserved significant historical and cultural monuments, as well as unique natural sites. This sports and tourism project was launched in 2015 and since then has attracted and united not only professional runners, but also running enthusiasts, supporters of a healthy lifestyle and running tourism from different parts of the country.

Keywords: *running tourism, mass races, Russian tourism, ‘Pharmeco – Running along the Golden Ring’.*

Introduction. The trends of the 21st century are tourism, travel and various running competitions. These activities often go hand in hand: you travel to new places, explore various attractions and continue to enjoy your favourite hobby by participating in running competitions. Currently, the level of organisation and conduct of mass sporting running events in Russia has grown significantly. The organisers of mass runs strive to attract not only renowned professional runners to their competitions, but mainly as many amateur runners as possible, who often make up to 99% of the total number of participants in running events [1, 3, 4, 6]. It is these running enthusiasts who, in recent years, have been shaping and defining the development of a new direction in the tourism sector – running tourism, which is actively gaining momentum and supporters in Russia. The goal of running tourism is not only to participate in mass races and promote a healthy lifestyle, but also to organise useful leisure activities: independent or organised exploration of the historical, natural, cultural, gastronomic and other features of the city or region of the country where the sporting event is held.

Objective of the study is to identify the characteristics of the development of running tourism in Russia, using the example of the series of mass runs ‘Pharmeco – Running along the Golden Ring’.

Methods and structure of the study. An analysis and summary of data from specialised and scientific-methodological literature has been conducted.

Results of the study and discussion. Russia hosts many mass athletics races that attract large numbers of participants. Among the most famous and popular are the Moscow Marathon and Moscow Half Marathon, the Road of Life and White Nights marathons in St. Petersburg, the Kazan Marathon, and others. [1, 3, 4]. All these races have their own history, are highly organised and contribute to the development of running tourism in the country, but they are tied to one city.

In 2015, on the initiative of the Yaroslavl Oblast administration and the Pharmeco group of compa-

nies, the first series of annual mass athletics races 'Pharmeco – Running along the Golden Ring' (RGR) was held. This sports and tourism project was aimed at implementing an unusual idea: not just to visit the cities of the famous tourist route 'Golden Ring of Russia' and get acquainted with the historical and cultural heritage of our ancestors, but also to combine these trips with participation in running events in these cities together with family, friends and like-minded people.

The first RGR series in 2015 was held in seven cities in the Yaroslavl Oblast: Yaroslavl, Tutaev, Myshkin, Pereslavl-Zalessky, Rybinsk, Uglich, and Rostov Veliky. It was attended by 13,000 people from 15 countries and 47 regions of Russia. The All-Russian Athletics Federation named it the best running project of the year in Russia. The next year, the series went beyond the Yaroslavl Oblast, with Kostroma joining the project. In 2017, Moscow, Kolomna and Sergiev Posad joined the project; in 2018, Vladimir and Tula joined, and in 2019, Ivanovo joined.

Currently, RGR is the largest series of mass races in Russia, which take place from May to October, attracting both amateur and professional runners. For the last four years, the RGR calendar has included races in 10 cities from four regions of the country: seven cities in the Yaroslavl Oblast (Tutaev, Myshkin, Rybinsk, Uglich, Pereslavl-Zalessky, Yaroslavl and Rostov Veliky), as well as Kostroma, Ivanovo and Moscow. Since 2024, the series has been included in the federal programme 'Sport is the norm of life'.

Table 1 presents data from the organisers on the number of stages and participants for the entire duration of the RGR – from 2015 to 2025.

RGR reached its peak values in 2018 and 2019. The subsequent sharp decline in stages and number of participants in 2020 is due to restrictions imposed because of the COVID-19 pandemic. Starting in 2022, RGR indicators stabilised: 10 stages and 25-29 thousand participants. In our opinion, this stabilisation is due to the following reasons: firstly, in small ancient Russian towns in the Yaroslavl Oblast, it is difficult to increase the number of participants due to a lack of accommodation in hotels, etc.; Secondly, after getting acquainted with the RGR series, many participants plan to take part in races in other cities of our country next year. Moreover, the running movement in Russia is currently on the rise, and there is a wide choice of competitions.

Anyone who has paid the entry fee and has a doctor's certificate allowing them to compete can take part in the RGR. Each running event has competitive distances for adults (5, 10 and 21 km) and for children (300, 600 m and 3 km). That is why you can see both preschoolers and elderly pensioners at the races in each city. At the finish line, participants receive a beautiful medal, and the organisers give children gifts with sweets. At the same time, there are 'Equal Opportunity Runs' for people with special health needs. It is also possible to participate in the RGR online, where the organisers take into account the runners' tracker readings.

The race routes in the cities of the Yaroslavl Oblast and Kostroma run along the central streets, where the main cultural and historical sights are located, and runners have the opportunity to see all this while running, as if on a running tour. These cities are located on the banks of the largest river in the European part of the Russian Federation, the Volga, while Pereslavl-Zalessky and Rostov Veliky are located on large lakes (Pleshcheyevo and Nero), so part of the running routes run along the embankments, where the views of nature and the beauty of historical sites help participants overcome the competitive distance.

The most popular route for many RGR participants is the tourist route in Yaroslavl, which is over 10 km long and is the only one in the world that runs entirely through a UNESCO protected area.

It is therefore no coincidence that the most popular RGR events have almost always been the races at the Yaroslavl Golden Ring Half Marathon. In 2025, it was rivalled by the Moscow Half Marathon 'My Capital', which has been the final race in the series for many years. For the first time in the history of the RGR, the stages in Yaroslavl and Moscow in 2025 were held over

Table 1. Number of participants (thousands) and stages in RGR

Indicators	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Number of stages	7	8	10	13	12	5	8	10	10	10	10
Number of participants	13	18	24	34	32	13	17	25	25	27	29

two days: on Saturday, children's races and 5 km, and on Sunday, 10 and 21 km.

However, the events of the RGR series are not only about sports (holding races of various distances, awarding winners in absolute and age categories), but also a real festival of culture and folk art. For each city, participation in the RGR project is a significant event with a powerful tourist and economic effect [2, 5]. This is especially true for the Upper Volga cities of the Yaroslavl Oblast. After all, thousands of participants from dozens of regions of Russia and even from abroad come to each stage. Many of them book hotels and guesthouses, try local cuisine in restaurants and cafes, buy souvenirs, book excursion programmes or independently explore the history of the city and country by visiting museums, exhibitions and other historical and cultural attractions. One way or another, every participant in the running event comes into contact with the culture and history of our great country, and ancient Russian cities become recognisable thanks to such a vibrant sporting event as the RGR series.

All RGR events are also characterised by a surprisingly friendly festive atmosphere – lots of positivity, fun, music and sport. All cities in the series host a rich concert programme: participants and spectators are welcomed and entertained by performances from local orchestras, dance groups and choirs. There is a feeling of genuine national unity and celebration in this ancient Russian land, which has a bright future. It is a pleasant place to come and spend Sundays and holidays with family and friends, take a break from the hustle and bustle of big cities, run your distance and, of course, get in touch with the history of our great country.

Conclusions. Initially, the 'Pharmeco – Running along the Golden Ring' project was based on three values: a) promoting and developing children's, youth, amateur and mass sports; b) organising healthy leisure activities for participants (including families); c) attracting interest in travelling to historical sites in Russia. Every year, the unprecedented RGR series attracts more and more participants who, together with fans, become immersed in running culture, engage in running tourism and healthy lifestyles, and thus contribute to the nation's health.

For many participants, the project has become not only an opportunity to realise their sporting ambitions, but also a chance to learn about the rich history and traditions of the Upper Volga cities. Each RGR running event turns into a vibrant city festival, which has become a favourite leisure activity for many families, running enthusiasts, corporate teams and supporters of running tourism, combining running and weekend travel.

For each city, participation in the RGR series is a significant event with a powerful tourist and economic effect, thanks to the influx of runners on the days of the competitions, and the cities themselves become recognisable for such a vibrant sporting event as the RGR series. Currently, RGR is the largest series of mass races in Russia, taking place from May to October and attracting both amateurs and professionals. Since 2022, RGR has been held in four regions and ten cities across our country.

References

1. Adelfinskiy A.S. Prichiny begovogo buma 2010-h: keys-stadi krupneyshego marafona Rossii. Monitoring obshchestvennogo mneniya ekonomicheskie i sotsialnye peremeny. 2021. No. 4. Pp. 275-299.
2. Baranova E.A. Kreativnaya ideya kak instrument razvitiya natsionalnyh turisticheskih marshrutov. Vestnik RMAT. 2022. No. 4. Pp. 136-139.
3. Kannykin S.V. K voprosu o sotsiokulturnoy spetsifike razvitiya begovyh praktik v Rossii. Sotsiodinamika. 2022. No. 3. Pp. 45-66.
4. Rykov S.S. Lyubitelskie begovye marafony kak sobytie: organizatsiya, klassifikatsiya i sotsiokulturnye effekty. Vestnik kultury i iskusstv. 2022. No. 1(69). Pp. 94-103.
5. Chumikov A.N., Chumikova S.Yu., Protsenko Yu.V. Brending malyh gorodov kak razvitie turisticheskih vozmozhnostey territorii. Vestnik RMAT. 2021. No. 4. Pp. 106-110.
6. Shvetsov A.V., Fomin Yu.A. Professionalizm i lyubitelstvo v sovremennom olimpiyskom sporte. Gumanitarnye nauki Vestnik Finansovogo universiteta. 2022. V.12. No. 1. Pp. 139-144.