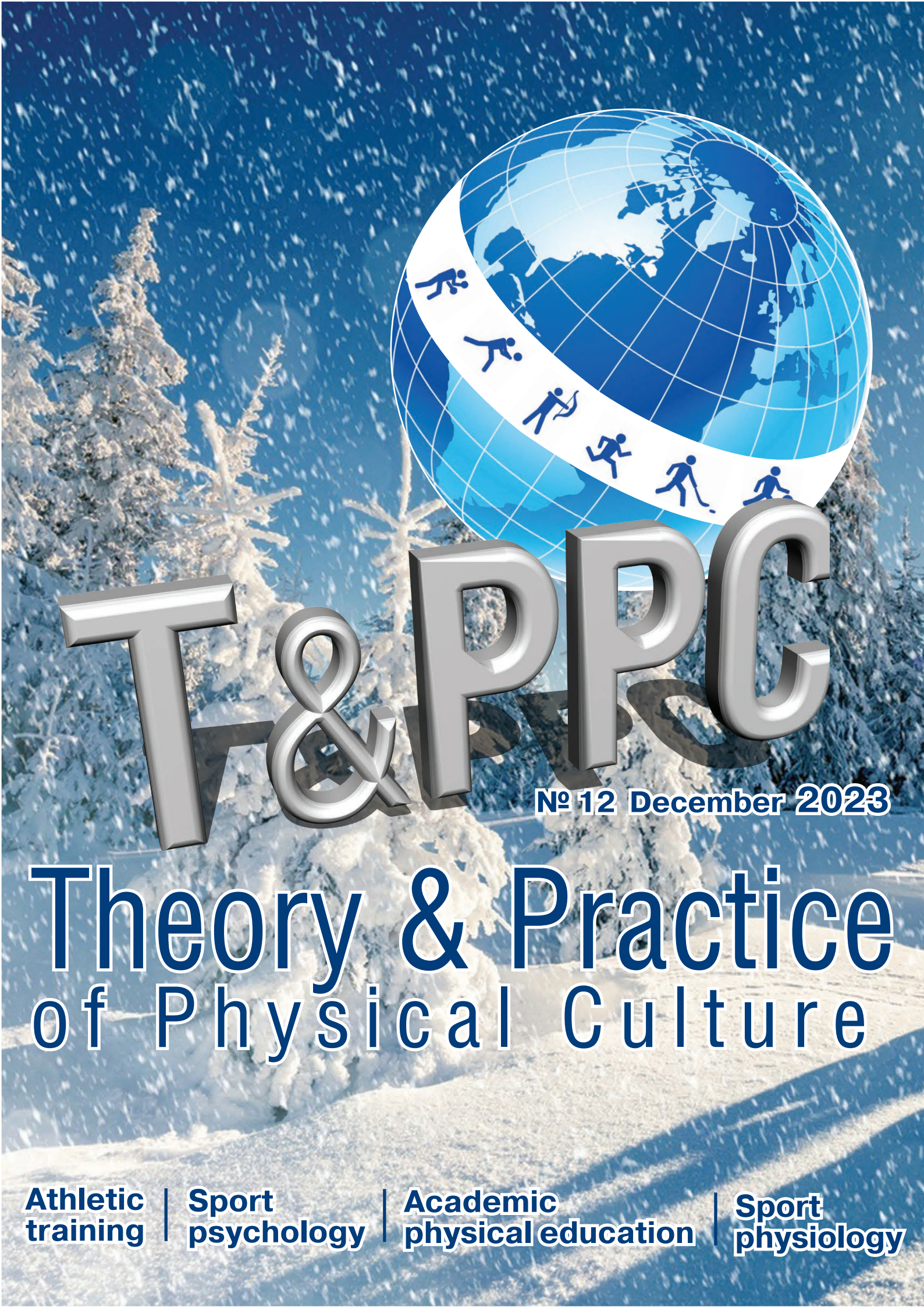

№ 12 December 2023

# Theory & Practice of Physical Culture

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

# The phenomenon of professionally applied sports culture: structure and content

One of the current innovations of modern physical education is the technology of sportization, which is capable of building the educational process on the principle of conversion of high sports technologies, providing students with a free choice of types of sports practice, which allows expanding the number of students.

Considering the external political tension in which our country has found itself in recent years, the target orientation of physical education of educational institutions should be associated with the use of applied sports, such as running, swimming, skiing, shooting, martial arts, allowing the formation of professional applied sports personality culture.

The professional and applied orientation of classes in sports physical education is manifested in the fact that priority is given to methods of teaching professionally significant and applied skills, the formation of psychological stability, motivation and psychophysical readiness to perform future labor functions and military service through active participation in the process of sports training. Thus, a social and educational demand is created for the formation of a professionally applied sports culture, which can be defined as a student's personal quality associated with his psychophysical readiness to carry out work.

What distinguishes professional applied sports culture from basic physical culture is that the use of applied sports allows one to successfully simulate the actions of production activities in various situations, including extreme ones.

The substantive basis of the professional-applied sports culture of a student's personality is such basic components as cognitive, motivational-value, activity-effective, emotional-volitional, reflective, which are formed in the process of educational and competitive activities.

The cognitive component is based on the integration of knowledge in the field of physical education, professional and applied sports and is determined by the level of mental fortitude, which allows the future specialist to cope with difficult situations.

The content of the motivational-value component includes the values of the individual's sports culture, which are formed in the process of the individual's internalization of the cultural and educational potential, values and technologies of sports, as well as as a result of the accumulation of experience in physical culture and sports activities and filling it with personal meaning.

The activity-effective component is expressed in the student's systematic participation in training and competitive activities.

The ability to receive and control emotions from sports activities, to prepare oneself for participation in sports competitions, and to manage the pre-start state determine the emotional-volitional component.

A special feature of the reflexive component is the student's ability to analyze his own participation in sports activities, identify difficulties and correct emerging errors in sports training, and determine prognostic guidelines for improving sports professionalism.

Professional-applied sports activities within the framework of sports-based physical education at a university make it possible to effectively form a professional-applied sports culture, which is determined by the integration of knowledge, accumulated experience and values of applied sports.

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

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

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Theory and Practice of Physical Culture

# Contents

# Variation of the volume and intensity of physical activity in the current planning of the training process in women's mini-football

UDC 796.012

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**Abstract**

**Objective of the study** was to determine and prove the feasibility of varying the volume and intensity of physical activity in the current training plan for female athletes in futsal.

**Methods and structure of the study.** The pedagogical experiment, in which 24 athletes took part, was carried out during 2022/2023. on the basis of the MosPolitech mini-football club (Moscow), which takes part in the Russian championship among women's teams. The principle scheme for the distribution of sports loads in the annual training cycle of athletes provided for a gradual increase in volume in the preparatory period (November - January), which stabilized in the competitive period (January - March), after which it constantly decreases.

**Results and conclusions.** The volume and intensity of physical activity in the current training plan for qualified female athletes in the preparatory period of the annual training cycle tends to gradually increase, reaching its maximum towards its end. At the same time, it is characteristic that it is considered very advisable to dose physical activity in the preparatory period of the annual training cycle, taking into account the individual characteristics of qualified athletes in mini-football and their playing role, ensuring an increase in the level of physical and technical-tactical readiness.

***Keywords:*** *mini-football, qualified athletes, current training plan, physical activity, volume and intensity, training aids.*

**Introduction.** The effectiveness of training qualified female athletes in mini-football is determined by the use of advanced approaches in organizing the training process in the annual training cycle. The basis of the training process of qualified female athletes in mini-football is a variety of physical exercises performed at various stages of the annual cycle in a certain volume and with a given intensity, which are determined by the individual capabilities of the athletes' bodies [2, 3, 5, 6].

Variation in physical activity in mini-football is largely determined by age, gender, level of preparedness, as well as individual characteristics of the body's development. High-quality planning of the volume and intensity of physical activity with direct observance and control of the parameters of motor actions allows significant progress in solving the issues of optimizing the physical condition of female athletes throughout the entire playing season [1, 4].

Thus, the weak scientific and methodological substantiation of effective methods for optimizing physical activity in the preparation of qualified athletes in mini-football determined the relevance of this study.

**Objective of the study** was to determine and prove the feasibility of varying the volume and intensity of physical activity in the current training plan for female athletes in futsal.

**Methods and structure of the study.** The pedagogical experiment, in which 24 athletes took part, was carried out during 2022/2023 at the MosPolitech mini-football club (Moscow), which takes part in the Russian championship among women's teams. The principle scheme for the distribution of sports loads in the annual training cycle of athletes provided for a gradual increase in volume in the preparatory period (November - January), which stabilized in the competitive period (January - March), after which it constantly decreases. The intensity of the loads invariably

increases from the beginning of classes and almost throughout the preparatory period of the annual training cycle, and in the competitive period it had its maximum values. The effectiveness of varying the volume and intensity of physical activity in the current training plan for female athletes in mini-football was assessed as part of a pedagogical experiment on the dynamics of indicators of physical and technical-tactical readiness of female athletes.

**Results of the study and discussion.** During the sequential pedagogical experiment, with the help of control pedagogical tests, positive changes in indicators of the development of physical qualities and abilities were identified (Fig. 1).

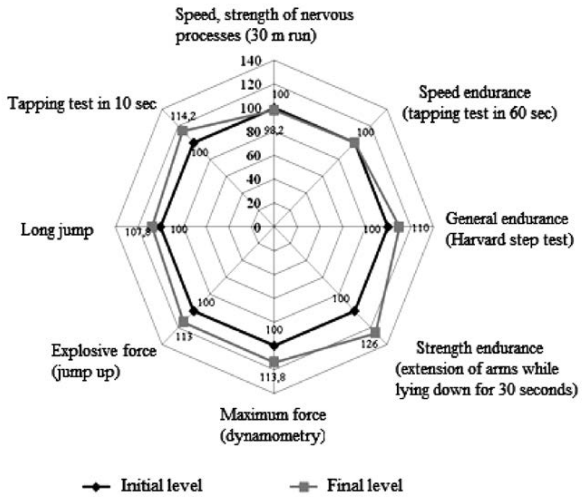


*Figure 1. Dynamics of physical fitness indicators of qualified athletes in mini-football (%)*

Speed indicators decreased by 1.8%, this is explained by the fact that the examination was carried out after the competition. There is no change in the speed endurance indicator. Further indicators have a positive increase. The amount of increase in overall endurance increased by 10%. The explosive force indicator increased slightly more, amounting to 13%. Maximum strength increased by 13.8%. The greatest increase is in the development of strength endurance; it increased by 26%.

Technical and tactical indicators of competitive activity of qualified female athletes in mini-football are presented in Figure 2.

The smallest increase in the indicators we observed was found in the number of assists. This figure increased by 11.7%. A slightly more significant improvement was found in changes in defensive performance. Here the improvement was 20.7%. Also, positive changes were found in the indicators of effective

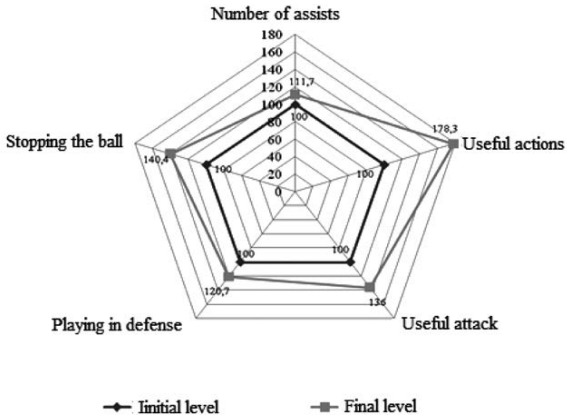


*Figure 2. Dynamics of technical and tactical readiness of qualified athletes in mini-football (%)*

ball stopping and attack, which are 40.4% and 36% respectively. The most positive result was obtained in the action utility indicator, the improvement of which was more than 50%.

The high increase in technical and tactical indicators, in our opinion, indicates the positive influence of the options for the volume and intensity of physical activity proposed during the pedagogical experiment in the current training plan for female athletes in mini-football. As a result of the analysis, we came to the conclusion that the proposed volumes and intensity of physical activity allowed qualified athletes in mini-football to reach the required level of preparedness, which meets the regulatory requirements of the modern game.

**Conclusions**. The volume and intensity of physical activity in the current training plan for qualified female athletes in the preparatory period of the annual training cycle tends to gradually increase, reaching its maximum towards its end. At the same time, it is characteristic that it is considered very advisable to dose physical activity in the preparatory period of the annual training cycle, taking into account the individual characteristics of qualified athletes in mini-football and their playing role, ensuring an increase in the level of physical and technical-tactical readiness.

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## SCIENTIFIC NOTE

# A complex of typical situations of the use of service weapons by police employees to reflect an armed attack

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***Key words:*** *police, fire training, service weapons, situations, attack.*

**Introduction.** In the process of professional training, police officers develop shooting skills from service weapons during fire training classes [1]. Currently, there is a need to further improve the professional training of police officers and introduce situational training into the fire training process. In this regard, the most relevant for study are situations of repelling an attack on a police officer [2]. However, at present there is no theoretically substantiated and tested educational and methodological support for this educational process.

Purpose of the research – development of a set of typical situations of the use of service weapons by police officers to repel an armed attack.

**Research methodology and organization.** The study was conducted in 2022-2023. on the basis of the Tyumen Institute for Advanced Training of Employees of the Ministry of Internal Affairs of the Russian Federation. The study used scientific methods: analysis and generalization of situations where police officers used service weapons to repel an armed attack.

**Results and its discussion.** In 2023, based on the results of research work, a set of typical situations of police officers using service weapons to repel an armed attack was developed. This complex includes various options for the integrated use of service weapons, physical force and special means by police officers personally, or during interaction in an open area or in a confined space in situations of suppression by the PPSP squad of drinking alcohol in a public place or when checking documents, or in the process of door-to-door bypass, or when attacking employees in order to take possession of weapons. The variability in the use of service weapons also included the possibility of using cover for an employee; the need to fire while moving (moving), including shooting while moving from moving vehicles. The developed set of standard situations was successfully tested in 2023 as part of the development of variable disciplines by police patrol officers studying under professional training programs for the position of “Policeman”.

**Conclusion.** The developed set of typical situations of using service weapons to repel an armed attack helps improve the level of professional preparedness of police officers.

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# Comparative analysis of snap techniques in young weightathleters at the initial and training stages of sports training

UDC 796.012

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**Abstract**

**Objective of the study** was to compare general and specific criteria for snatch technique among young weightlifters at the initial (26 people aged 9-12 years) and training (129 people aged 13-17 years) stages of sports training.

**Methods and structure of the study.** The technical skill of the athletes was assessed during official competitions using bilateral video recording. The kinematic and dynamic characteristics of the movement of the CM of the barbell were calculated, on the basis of which the criteria for the technical skill of the athletes were determined.

**Results and conclusions.** It was shown that only five athletes at the initial stage of preparation and eight athletes at the training stage corresponded to the criteria of technique corresponding to the values of the rational way of performing this exercise. The remaining athletes had two or more technical errors. From this we can conclude that coaches do not pay enough attention to developing the correct snatch technique.

***Keywords:*** *criteria of rationality and effectiveness of sports equipment, biomechanics of weightlifting exercises, biomechanical control.*

**Introduction.** The problem of technical skill of athletes in the early stages of training is one of the most important, since as the skill of competitive exercises is formed and automated, the difficulties in eliminating errors in the technique of performing them increase. Formation and improvement of the technical skills of weightlifters presupposes knowledge of the requirements and criteria for the rational technique of classical exercises, based on which it is possible to formulate recommendations for their correct implementation, taking into account the individual characteristics and level of preparedness of the athletes [1, 2]. This is especially important for weightlifters at the initial and training stages of sports training.

Our research in this direction, conducted on highly qualified weightlifters [3], when comparing athletes of light and heavy weight categories [5], men and women [10], allowed us to identify the following criteria [3, 6]:

– CE1 – coefficient of implementation efficiency of the snatch technique (generalized criterion). This criterion is determined by the difference between the result shown in the competition and the theoretical result, calculated by regression equations between the maximum vertical power in the snatch and the actual result. Positive coefficient values indicate a more effective technique, and negative coefficients indicate a less effective technique. The higher the coefficients, the higher the level of technical skill of the athlete.

– H1 – height of the CM of the bar at the beginning of the final acceleration phase relative to the athlete's height. At this time, the athlete performs "knocking" the barbell. The greater the height at the beginning of the "kick," the more technical the athlete.

– H3 – maximum height of the CM of the barbell after the lift relative to the athlete's height. The lower the height, the more technical the athlete.

– Y3 – horizontal coordinate of the highest point of the trajectory of the CM of the barbell in the unsupported phase of the squat. Positive values of this indicator indicate that the bar is moving in the "up and back" direction, and negative values "up and forward". The more the position of the point deviates from the vertical towards the athlete's body, the closer the trajectory of the CM of the barbell is to the rational one.

– Vv – maximum vertical speed in the final acceleration phase. The value of this speed should be optimal

for each athlete, but the lower it is, the more technical the athlete.

– dVv – decrease in vertical velocity in the transition phase. The less speed loss, the more technical the athlete.

– Vg – maximum horizontal speed in the final acceleration phase. Its value must be optimal and correlate with the correct direction of lifting the projectile.

**Objective of the study** was to compare the listed criteria for the snatch technique among athletes at the initial and training stages of sports training and to identify the most common errors in the technique of performing this exercise.

**Methods and structure of the study.** The assessment of the technical skill of athletes was carried out on the basis of recording the kinematic and dynamic characteristics of the movement of the barbell during official competitions.

At the initial stage of sports training, young weightlifters (26 boys and girls) of different weight categories, who competed at the "Olympic Hopes" competition at the Olympic Reserve School No. 2 in Moscow, took part in the experiment. The average age of the athletes is 11.9±1.0 years, body weight is 44.9±11.5 kg and body length is 153±10.6 cm.

Bilateral video recording was carried out with Cannon-EOS80D cameras at a frequency of 50 frames per second. Video cameras were located on both sides of the weightlifting platform at a height of 1.1 m. Markers were attached to the ends of the barbell, on the basis of which the kinematic and dynamic characteristics of the movement of the center of mass (CM) of the barbell were calculated.

A similar experiment was carried out on young athletes during the training stage of preparation, in which significantly more athletes participated (129 boys and girls: 96 athletes aged 13-15 years and 33 athletes aged 16-17 years) of different weight categories competing in 2022 at competitions: "Olympic hopes"; Moscow Cup; Moscow Championships (in October and December of this year) and the Moscow Championships, which took place at the Olympic Reserve School No. 2 in Moscow. The average age of the athletes was 14.7±1.3 years, body weight was 63.8±15.8 kg and body length was 167±9.2 cm. Bilateral video recording was carried out with Cannon-EOS90D cameras at a frequency of 100 frames per second. Video cameras were located on both sides of the weightlifting platform at a height of 1.2 m.

Since the main criterion for the technical skill of athletes, determined by the method of regression residuals, is not the sports result, but the degree to which the athlete uses his speed-strength capabilities, we considered it possible in both cases to combine boys and girls into one sample of subjects.

**Results of the study and discussion.** To assess the technical skill of weightlifters, generalized and specific criteria for the effectiveness of technique were determined during the initial training period (I) and during the training period (II), the average values of which for the snatch are presented in Table 1.

The generalized criterion for the implementation efficiency of a technique for athletes was determined by regression equations between the maximum vertical power that athletes develop in the final acceleration phase and the result in the snatch. For athletes at the initial stage of preparation, the correlation coefficient between the discussed indicators is 0.95, and for athletes at the training stage - 0.87.

The corresponding regression equations are:

at the first stage – $Rt=3.40+0.030\times Pz$;

at the second stage – $Rt=8.59+0.033\times Pz$, где

Rt – theoretical result in snatch; Pz – maximum vertical power in the final acceleration.

In most cases, the average values and variability indicators do not differ statistically significantly among athletes at different stages of training. The exception is the relative horizontal alternation of the highest point of the lifting trajectory of the bar (shown in bold in the table) and the maximum vertical speed of the bar, the average values of which are statistically significantly different from each other ($p<0.01$ and $p<0.001$, respectively). The negative value of the highest point of the trajectory indicates that athletes at the training stage lift the barbell "up and forward" to a greater extent, which is less rational. In addition, these athletes accelerate the barbell to high vertical speeds and lift the barbell to a large relative height ($p<0.01$), which is also irrational. Let us note that athletes at the training stage of preparation are distinguished by large interindividual variability of the generalized criterion of the jerk technique of maximum horizontal speed in the final acceleration phase, as evidenced by statistically significantly large standard deviations of these indicators among athletes at the training stage of preparation ($p<0.01$).

Analysis of the correlation dependencies of particular criteria with the general criterion of the implementation efficiency of a technique suggests that technical athletes are distinguished by more economical execution of exercises (Table 2). This is evidenced by the negative correlation between the maximum lifting height of the bar after the lift (-0.63 and -0.39) and the maximum vertical speed of the bar at the end of the final acceleration (-0.80 and -0.68) among athletes of the initial and training stages, respectively. Unlike athletes at the initial stage of preparation, athletes at the training stage are distinguished by a statistically significant correlation of the relative height of the barbell at the beginning of the final acceleration (0.48)

**Table 1.** *Generalized and specific criteria for the effectiveness of the technique in the snatch during the initial preparation period (I) and during the training period (II)*

| Criterion name | Stages preparation | Average arithmetic | Standard deviation |
|---|---|---|---|
| Equipment sales efficiency coefficients (kg) – CE1 | I<br>II | -0,09<br>0,05 | ±4,49<br>±9,91 |
| Relative height of the CM of the barbell at the beginning of the final acceleration phase (%) – H1 | I<br>II | 33,3<br>34,9 | ±4,2<br>±4,2 |
| Relative maximum height of the CM of the barbell after detonation (%) – H3 | I<br>II | 67,9<br>70,0 | ±3,85<br>±4,0 |
| Relative horizontal movement of the highest point of the CM of the barbell trajectory (%) – Y3 | I<br>II | 2,47<br>-0,38 | ±5,41<br>±4,57 |
| Maximum vertical speed in the final acceleration phase (m/s) – Vv | I<br>II | 1,94<br>2,08 | ±0,16<br>±0,15 |
| Decrease in vertical speed in the transition phase (m/s) – dVv | I<br>II | 0,12<br>0,09 | ±0,22<br>±0,25 |
| Maximum horizontal speed in the final acceleration phase (m/s) – Vg | I<br>II | 0,67<br>0,57 | ±0,21<br>±0,57 |

with the general criterion for the effectiveness of the snatch technique, which meets the requirements for the rational technique of this exercise.

A common feature of the technique of young weightlifters is that in the final phase of the snatch, athletes accelerate the barbell to greater than required vertical speed values (Vv) and lift the projectile to a greater height (H3), that is, many athletes tear the barbell in a half-squat position, which is irrational.

Analysis of the individual values of the considered criteria for the snatch technique shows that according to the generalized criterion at the initial stage of preparation, only five athletes out of 26 (19.2%) demonstrate an "excellent" level of technical skill, and in the group of athletes at the training stage of preparation this percentage is even lower - 17 athletes out of 129 (13.2%).

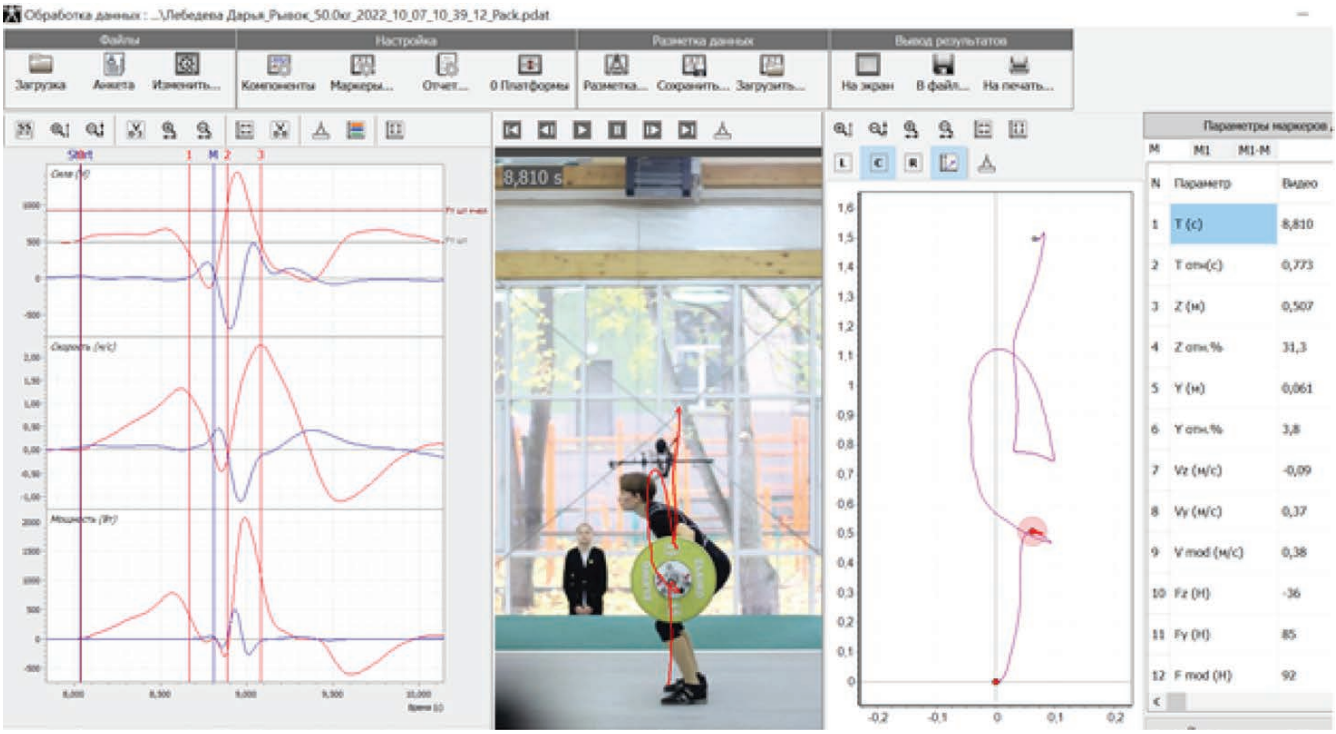
As for private criteria, in the initial training group and in the training stage group, respectively, the percentage of athletes with "excellent" technique is as follows: the relative height of the barbell at the beginning of the final acceleration is 26.8% and 29.1%; relative maximum boom height – 24.7% and 10.9%; relative horizontal movement of the rod at maximum lifting height – 30.4% and 26.4%; – maximum vertical speed in the final acceleration – 28.5% and 19.4%; decrease in vertical speed in the transition phase – 69.2% and 77.5%; the maximum horizontal speed in the transition phase is 39.3% and 17.8%.

Note that only five weightlifters at the initial stage and eight athletes at the training stage demonstrated a snatch technique close to the rational version; the remaining athletes had two or more errors in the technique.

As an example, we present the results of processing video data from athlete L-voy (16 years old, snatch result of 50 kg), whose technique can be assessed as "very poor" (see figure). The general criterion for the implementation efficiency of equipment is -20 kg. In the preliminary acceleration, the athlete imparts a vertical speed to the barbell of 1.32 m/s; in the transition phase, this speed drops to zero and even the barbell moves downward for some time. The decrease in speed is caused by the fact that the athlete sits under

**Table 2.** *Correlation coefficients of the result in the snatch and the general efficiency coefficient of the snatch technique with particular criteria for the effectiveness of the technique in young weightlifters*

| Criterion name | Stages reparation | CE1 |
|---|---|---|
| Relative height of the barbell at the beginning of the final acceleration | I<br>II | -0,09<br>0,48 |
| Relative maximum height of the barbell | I<br>II | -0,63<br>-0,39 |
| Relative horizontal movement of the bar at the maximum lifting height | I<br>II | 0,33<br>0,11 |
| Maximum vertical speed in final acceleration | I<br>II | -0,80<br>-0,68 |
| Reduction of vertical speed in the transition phase | I<br>II | -0,55<br>-0,24 |
| Maximum horizontal speed in the transition phase | I<br>II | 0,15<br>-0,28 |




*Results of processing data from video recording of athlete L-voy. The athlete's posture corresponds to the moment the barbell moves down in the middle of the transition phase*

the barbell and bends her arms at the elbow joints, as a result of which the speed drops by 1.78 m/s. At the beginning of the final acceleration phase, the CM of the barbell is at a height of 47.8 cm (29.5% of the body length), which is irrational.

In the final acceleration phase, the athlete accelerates the projectile to 2.25 m/s and lifts it to a height of 1.12 m (69.2%), while the maximum horizontal speed of the bar reaches 1.11 m/s. The direction of lifting the barbell is predominantly upward.

Thus, all the values of the criteria for the snatch technique considered by us for this athlete do not correspond to rational values, and this case is far from isolated.

**Conclusions.** The results of a comparative analysis show that coaches pay insufficient attention to the technical training of weightlifters at the initial and training stages of sports training. Many athletes make mistakes in the snatch technique, the correction of which is difficult and sometimes simply impossible at subsequent stages of sports training.

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# Metabolic features of qualified academic woman rowing in the boat and on the rowing machines

UDC 796.012

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**Abstract**

**Objective of the study** was to identify the features of metabolic support for rowing by qualified academic women in a boat and on rowing ergometers, taking into account the pace of exercises.

**Methods and structure of the study.** The indicators reflecting the metabolic characteristics of qualified female academics were studied when rowing at different rates (22-24 strokes/min; 26-28 strokes/min; 30-32 strokes/min), in a boat and on the Concept-2 and RP3 rowing machines. Four female academicians qualified as candidate master of sports and master of sports took part in the study. Age – 19.5±2.4 years; body length – 179.5±6.8 cm; body weight – 75.3±12.7 kg.

**Results and conclusions.** It was revealed that when rowing qualified female academics at a rate of 22-24 strokes/min in a boat and on Concept-2 and RP3 ergometers, the criteria for metabolic support of work did not have significant differences. At this pace, the load can be classified as a zone of moderate physiological power. When rowing at a rate of 24-26 strokes/min on rowing ergometers among qualified academicians, the metabolic support criteria for work were significantly higher than when rowing in a boat. Rowing on ergometers at this pace can be classified as a load of high physiological power, and rowing in a boat can be classified as a load of moderate power.

When rowing at a rate of 30-32 strokes/min on rowing ergometers, the level of biological stress (internal load) among female academics was significantly higher than when rowing in a boat, and the load should be attributed to the zone of submaximal physiological load. In this case, rowing in a boat can be classified as a zone of high physiological power. Rowing on the Concept-2 and RP3 ergometers for academic women is a more intense exercise compared to rowing in a boat. Performing intense exercises on rowing ergometers involves a significant increase in energy expenditure and, accordingly, recovery time in female athletes.

***Keywords:*** *academic rowing, rowing pace, metabolic support of the load, physiological stress.*

**Introduction.** At the present stage of development of rowing, the method of training rowers involves performing a significant amount of training load on rowing machines. The most popular rowing ergometers are Concept-2 and RP3; the design feature that distinguishes this machine from the concept is the movable footrest.

Experts believe that the technique of rowing in a boat and on simulators has certain differences. Thus, the stroke in the boat is 11-12% longer, a faster increase in effort and speed of extension of the lower extremities in the boat and on the RP3 ergometer was noted, compared to rowing on the Concept-2 ergometer. Rowing on ergometers is characterized by a higher tempo compared to rowing in a boat at the same power output, as well as higher forces on the handle when simulated on competitive loads on ergometers [1-4].

Rowing tempo is often used as a criterion for the intensity of training exercises both in a boat and on simulators, since the relationship between rowing tempo and the average speed of the boat is well known [5-7].

Of practical interest for planning the training of rowers is the assessment of the magnitude of internal load (biological stress) when rowing at different rates in a boat and on ergometers.

**Objective of the study** was to identify the features of metabolic support for rowing by qualified academic women in a boat and on rowing ergometers, taking into account the pace of exercises.

**Methods and structure of the study.** The indicators reflecting the metabolic characteristics of qualified female academics were studied when rowing at different rates (22-24 strokes/min; 26-28 strokes/min; 30-32 strokes/min) in a boat and on the Concept-2 and RP3 rowing machines. Four female academicians qualified as Candidate Master of Sports and Master of Sports took part in the study. Age – 19.5±2.4 years; body length – 179.5±6.8 cm; body weight – 75.3±12.7 kg.

The study was carried out over three days. On the first day, the athletes, after a standard warm-up, rowed in singles every 2 minutes, progressively increasing the rowing pace, focusing on the indicators of the SpeedCoach monitor. On the second day, this test procedure was performed on the Concept-2 ergometer, and on the third day, on the RP3 ergometer.

The study of external respiration and gas exchange during testing loads was carried out using the MetaMax 3B-R2 cardiorespiratory stress diagnostic system from CORTEX (Germany). Airflow was measured using a turbine converter (Triple V). Two-point gas calibration (first gas - 15% $O_2$, 5% $CO_2$; second gas - ambient air) was carried out daily. Before each test, a single point gas calibration was performed using ambient air, as well as a flow sensor calibration using a 3 L syringe (Hans Rudolph, Kansas City, USA).

**Results of the study and discussion.** The table shows the dynamics of indicators reflecting the nature of metabolic reactions of qualified female academics when performing testing exercises.

It was revealed that the absolute and relative values of oxygen absorption when rowing at a rate of 22-24 strokes/min in a boat and on ergometers did not have significant differences. Indicators of pulmonary ventilation, respiratory exchange coefficient and heart rate also did not have significant differences. It can be assumed that the energy expenditure of female athletes when rowing at a low rate in a boat and on ergometers of different designs does not differ significantly. The work is performed with a predominance of the aerobic mechanism of energy supply, and the load can be classified as a zone of moderate physiological power.

*Indicators of metabolic reactions of qualified female academics when performing testing exercises at different paces in a boat and on rowing ergometers*

| Rowing pace strokes/min | Boat | Concept-2 | RP3 | P | | |
|---|---|---|---|---|---|---|
| | $M_1 \pm \sigma$ | $M_2 \pm \sigma$ | $M_3 \pm \sigma$ | | | |
| | $VO_2$, l/min | | | $M_1$-$M_2$ | $M_1$-$M_3$ | $M_2$-$M_3$ |
| 22-24 | 2,18±0,42 | 2,56±0,29 | 2,73±0,43 | >0,05 | >0,05 | >0,05 |
| 26-28 | 2,81±0,22 | 3,15±0,18 | 3,26±0,23 | <0,05 | <0,05 | >0,05 |
| 30-32 | 2,99±0,12 | 3,59±0,09 | 3,72±0,19 | <0,01 | <0,01 | >0,05 |
| $VO_2$, ml/kg/min | | | | | | |
| 22-24 | 28,37±3,36 | 34,52±4,68 | 34,11±2,22 | >0,05 | >0,05 | >0,05 |
| 26-28 | 32,88±2,13 | 38,08±3,28 | 37,92±1,96 | <0,01 | <0,01 | >0,05 |
| 30-32 | 35,29±0,95 | 41,79±1,36 | 43,98±1,82 | <0,01 | <0,01 | >0,05 |
| *VE*, l/min | | | | | | |
| 22-24 | 59,03±13,90 | 79,76±16,37 | 70,03±13,24 | >0,05 | >0,05 | >0,05 |
| 26-28 | 74,89±7,41 | 91,97±13,32 | 97,50±12,21 | <0,05 | <0,01 | >0,05 |
| 30-32 | 80,78±10,65 | 105,04±6,41 | 115,30±9,33 | <0,05 | <0,01 | >0,05 |
| RQ | | | | | | |
| 22-24 | 0,86±0,07 | 1,01±0,08 | 0,94±0,03 | >0,05 | >0,05 | >0,05 |
| 26-28 | 0,91±0,02 | 1,04±0,07 | 1,02±0,03 | <0,05 | <0,01 | >0,05 |
| 30-32 | 0,95±0,04 | 1,09±0,05 | 1,11±0,04 | <0,05 | <0,05 | >0,05 |
| Heart rate, beats/min | | | | | | |
| 22-24 | 148,2±13,85 | 158,0±6,33 | 160,54±7,85 | >0,05 | >0,05 | >0,05 |
| 26-28 | 161,4±8,47 | 170,9±4,34 | 176,8±4,67 | <0,05 | <0,01 | <0,01 |
| 30-32 | 173,8±1,98 | 181,9±2,60 | 183,2±2,26 | <0,05 | <0,01 | >0,05 |

When rowing at a rate of 24-26 strokes/min, the nature of the load when performing the testing exercise in a boat and on rowing ergometers changed. Thus, when rowing on ergometers, the indicators of oxygen absorption, pulmonary ventilation, respiratory exchange coefficient and heart rate significantly exceeded these indicators when rowing in a boat, which indicated a greater intensity of the load performed on ergometers compared to the load in the boat. It can be argued that rowing on ergometers at a pace of 26-28 for qualified academic women is a more intense exercise compared to rowing in a boat at the same pace, and can be classified as a load of high physiological power.

An analysis of the metabolic reactions of qualified female academics when performing testing exercises at a rate of 30-32 strokes/min showed a much higher level of biological stress (internal load) when rowing on ergometers compared to rowing on water. Thus, female athletes in terms of oxygen absorption, pulmonary ventilation, and heart rate exceeded the indicators recorded in the boat by 17-18%, 20-30%, 4-5%, respectively. At the same time, the respiratory exchange coefficient indicated that the work on ergometers was performed in a mixed aerobic-anaerobic energy supply mode, and the load should be attributed to the zone of submaximal physiological power.

The results of the study are consistent with the results of studying the biomechanics of rowing, in which it was shown that the structure of the developed forces when performing a stroke in a boat and on rowing ergometers differs in the magnitude of the EMG amplitude [1], and when rowing on Concept-2 and RP3 ergometers at a competitive pace rowers exert significantly greater effort compared to rowing in a boat [4]. This should inevitably lead to an increase in energy consumption, which was revealed in this study.

**Conclusions.** It was revealed that when rowing qualified female academics at a rate of 22-24 strokes/min in a boat and on Concept-2 and RP3 ergometers, the criteria for metabolic support of work did not have significant differences; at this rate, the load can be classified as a zone of moderate physiological power.

When rowing at a rate of 24-26 strokes/min on rowing ergometers among qualified academicians, the criteria for metabolic support of work were significantly higher than when rowing in a boat. Rowing on ergometers at this pace for qualified academic women is a more intense exercise compared to rowing in a boat, and can be classified as a load of high physiological power, while rowing in a boat can be classified as a zone of moderate power.

When rowing at a rate of 30-32 strokes/min on rowing ergometers, the level of biological stress (internal load) among qualified female academics was significantly higher than when rowing in a boat, and the load should be attributed to the zone of submaximal physiological power. In this case, rowing in a boat can be classified as a zone of high physiological power.

Thus, rowing on the Concept-2 and RP3 ergometers for qualified academic women is a more intense exercise compared to rowing in a boat. Performing intense exercises on rowing ergometers involves a significant increase in energy expenditure and, accordingly, recovery time for female athletes.

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# Sanitary and hygienic conditions for effective sports activities of players

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**Abstract**

**Objective of the study** was to give a detailed sanitary and hygienic description of the conditions of professional sports activities of team sports athletes and to prove that overload and overtraining of the body cannot but have a negative impact on the health of athletes, especially among athletes with high professional experience.

**Methods and structure of the study.** The microclimate of indoor sports facilities, temperature conditions, lighting, dust, and microbial contamination of training premises were studied. When analyzing the state of adaptation of the athletes' body, the indicators of cardiointervalography (CIG) were determined using the method of R.M. Baevsky in terms of the magnitude of the mode amplitude (AMo) and voltage index (VI). The state of health and circulatory system of gaming athletes was also analyzed based on the prevalence of chronic non-infectious diseases and ECG.

**Results and conclusions.** The results obtained indicated a significant decrease in the level of adaptation of the body and a lower level of health among trained athletes-players compared to the control group. These conclusions necessitate a government solution to many medical and legal problems regarding compliance with labor rights and guarantees, decent social security and full medical rehabilitation of athletes, both those who continue their sports career and those who have completed it, when they receive sports injuries and injuries.

***Keywords:*** *professional sports, hard work, physical overexertion, overtraining, social protection, social guarantees.*

**Introduction.** The constant increase in the level of sports results necessitates the need for special measures to preserve and strengthen the health of athletes, members and reserves of national teams, and Russian participants in major regional, national and international competitions [5]. According to sociological surveys, about 85% of athletes note insufficient state support after their retirement from elite sports for health reasons [2].

According to the majority of athletes, the issue of decent financing can be resolved favorably only for athletes who are members of elite clubs, since athletes of this level have the opportunity to insist on the necessary conditions of compensation under a contract with the club. Middle-level athletes objectively have no less chance of getting injured or an occupational disease, and this problem remains absolutely unresolved for them. According to most researchers, "physical culture and sports activities have a significant and comprehensive impact on the athlete's body. And this influence can be both positive and negative" [3].

**Objective of the study** was to identify the sanitary and hygienic conditions for effective sports activities of players.

**Methods and structure of the study.** The work analyzed the hygienic factors of the training process, the functional state and health of athletes, representatives of elite sports in team sports - hockey, football and volleyball. The research base was the training bases of the sports clubs "Salavat Yulaev", "Neftyanik Bashkortostan", and the gyms of the Bashkir Institute of Physical Culture (a branch of the Ural State University of Physical Culture). 34 team sports athletes, men aged 18-25 years, were examined. For control, the

functional and health status of students without high sports titles involved in physical education and sports at the Faculty of Physical Education of the Bashkir Institute of Physical Education was studied.

**Results of the study and discussion.** In team sports (with a single-cycle system), the preparatory period takes about two months a year, the competitive period - more than nine months, the transition period - one month. The duration of training sessions in the preparatory and pre-competition periods is about 40 hours a week, two training sessions lasting 2-3 hours a day, often without days off. Closer to competitions, the load is reduced to three to four hours a day.

The microclimate indicators of indoor sports facilities during training sessions of team sports athletes were compared with the optimal and acceptable hygienic standards regulated by Sanitary rules and regulations 2.2.4.548-96, the results obtained were assessed in accordance with Guide R 2.2.2006-05. It was found that all of them were within normal limits.

The severity of sports activities of athletes in team sports was assessed by indicators of physical dynamic load and static load using the example of hockey players (Table 1). Athletes of sports games devote part of their training time (two to three hours) to general physical training (running, flexibility exercises, stretching) and special training when they develop strength and speed-strength endurance in the gym. At the same time, athletes develop both the muscles of the lower and upper extremities. Then, after a break, athletes spend two to two and a half hours improving the technique and tactics of playing in their chosen sport.

**Table 1.** *Assessment of the severity of work of team sports athletes*

| ***Ergometric assessment of operations*** | | | | |
|---|---|---|---|---|
| **Type of operation (physical exercise)** | **Weight cargo, kg** | **Travel distance, m** | **Number operations per shift** | **Physical activity, kg*m** |
| Working on a hand simulator | 20 | 2 | 20 | 800 |
| Working on a hand simulator | 50 | 2 | 20 | 2000 |
| Working on a leg simulator | 20 | 2 | 20 | 800 |
| Working on a leg simulator | 50 | 2 | 20 | 2000 |
| Working on a back muscle simulator | 20 | 2 | 20 | 800 |
| Working on a back muscle simulator | 50 | 2 | 20 | 2000 |
| Average distance traveled during training including the game, km | | 13,8 | | |
| Average weight of sports equipment in ice hockey, kg | | 15,0 | | |
| ***Assessing the severity of work*** | | | | |
| **1.Physical dynamic load (units of external mechanical work per shift, kg*m)** | | | | |
| Indicator of the severity of the labor process according to R 2.2.22006-05 | The value of the indicator | | Class of working conditions according to R 2.2.2006-05 | |
| 1.1. With regional load (with the predominant participation of the muscles of the arms and shoulder girdle) when moving the cargo over a distance of up to 1 m (class 2.0 up to 5000) | 2800,0 | | 2.0 | |
| 1.2. With a general load (involving the muscles of the arms, body, legs) When moving a load over a distance of 1 to 5 m (class 1 to 12500) | 2800,0 | | 1.0 | |
| 1.2.2. When moving a load over a distance of more than 5 m (ice hockey) (class 3.2>70000) | 123000 Cargo weight not less than 15 kg average distance 8.2 km | | 3.2 | |
| 7. Displacements in space due to the technological process, km | | | | |
| 7. Horizontal in hockey (3.2 < 12 km) | 13,8 | | 3.2 | |
| 5. Working posture | | | | |
| 5.1. Periodically, more than 50% of the shift time, being in an uncomfortable and/or fixed position; being in a forced position (kneeling, squatting, etc.) for more than 25% of the shift time. Being in a standing position for more than 80% of the shift time. | | | 3.2 | |
| **General assessment of working conditions by severity in sports games** | | | **3.3** | |

**Table 2.** *Conventional standards for indicators of microbial air pollution in residential premises, m/o/m³*

| Air rating | Number of microorganisms | | | |
|---|---|---|---|---|
| | Warm period of the year | | Cold period of the year | |
| | Total | Of these, viridans staphylococcus and hemolytic streptococcus | Total | Of these, viridans staphylococcus and hemolytic streptococcus |
| Clean | < 1500 | <16 | < 4500 | < 36 |
| Contaminated | > 2500 | >36 | > 7000 | > 124 |

The average number of training games for athletes in sports games, according to timing studies, is 1.6 during one day, which corresponds, according to pedometer data, to a run length of 12.8 km. Taking into account the additional daily morning run of one to two km, the total length of the run is on average 13.8 km, which allows us to classify the work of team sports athletes according to this indicator as class 3.2 according to R 2.2.2006–05.

Indicators of physical dynamic load of athletes in team sports with regional load (with the predominant participation of the muscles of the arms and shoulder girdle) with movement of the load over a distance of up to one m do not exceed the parameters of class 2.0 according to R 2.2.2006-05. Indicators of physical dynamic load with a total load (involving the muscles of the arms, body, legs) when moving a load over a distance of one to five m due to the need to work on simulators designed to develop the muscles of the arms and legs do not exceed the parameters of class 1.0 according to R 2.2.2006 -05.

However, in hockey, the athlete must carry special equipment (equipment), its weight can be more than 20 kg. This determines for hockey players the importance of another indicator of the severity of work - physical dynamic load when moving a load over a distance of more than 5 m, which for an athlete-hockey player averages 123,000 kg×m, and corresponds to class of working conditions 3.2 (Table 1).

We also conducted a study of the sanitary and microbiological characteristics of the halls of indoor sports facilities for the sports being studied. Approximate values of safe, according to A.I. Shafir, the level of contamination by microorganisms (m/o) of premises where people are constantly present are given in Table 2 [4].

The actual content of microbial flora in the air environment of the surveyed indoor sports facilities is given in Table 3.

It was found that in terms of the total number of microorganisms contained in one cubic meter of air in indoor sports facilities and halls for sports games, the microbial contamination of the air corresponds to the upper limit of the above norm. However, the content of β-hemolytic streptococcus in both the warm and cold periods of the year according to this classification should be classified as “dirty”. In addition, staphylococci, yeast-like and mold fungi are present in the air environment of gyms for team sports. Fungal microflora and β-hemolytic streptococcus belong to the group of opportunistic microorganisms, therefore, their content cannot be assessed according to R 2.2.2006-05. At the same time, the microflora found in sports facilities can become a possible cause of various diseases in athletes, including purulent and fungal infections, the likelihood of which increases with a decrease in the body’s adaptation.

Indicators of adaptive capabilities of gaming athletes were assessed by the method of cardiointervalography (CIG) according to R.M. Baevsky [1].

After training, the AMo and VI indicators of athletes in team sports increased to values corresponding to the level of adaptation stress according to R.M. Baevsky. (Table 5).

**Table 3.** *Microbial contamination of gyms for team sports*

| Indoor sports facilities | Number of microorganisms in 1 m³ | | | | |
|---|---|---|---|---|---|
| | Total | of them: | | | |
| | | Staphylococci | β-hemolytic streptococcus | Yeast-like mushrooms | Mold mushrooms |
| Sports games (gyms of the clubs “Salavat Yulaev” and “Neftyanik Bashkortostan”, Bashkir Institute of Physical Culture) | 1350,7±146,4<br>3839,1±868,5 | 40,7±11,9<br>60,9±18,0 | 43,8±11,0<br>53,5±16,7 | 0<br>69,5± 9,7 | 21,5±8,2<br>66,8 ±10,4 |

*Note. The numerator is the warm period, the denominator is the cold period of the year.*

**Table 4.** *Standards for indicators of the level of adaptation of the body of men in age groups up to 25 years (according to R.M. Baevsky)*

| Level of adaptation | Indicators of CIG | |
|---|---|---|
| | AMo (M±m) | VI (M±m) |
| Satisfactory | 36 ± 3 | 67 ± 10 |
| Voltage | 43 ± 4 | 173 ± 73 |
| Unsatisfactory | 73 ± 9 | 303 ± 91 |
| Disruption | - | - |

***Table 5.*** *Indicators of adaptation of the body of team sports athletes before and after training*

| Monitoring group | Indicators of CIG | | | |
|---|---|---|---|---|
| | before training | | after training | |
| | AMo (M±m) | VI (M±m) | AMo (M±m) | VI (M±m) |
| Game sports | 33,3 ± 10,7 | 69,4 ± 16,6 | 50,0 ± 13,5 | 174,5 ± 66,7 |
| Control | 31,9 ± 8,7 | 65,3 ± 16,2 | 40,8 ± 8,9 | 98,9 ± 18,8 |

When assessing the state of health, we considered the prevalence of chronic non-infectious diseases according to in-depth medical examinations of athletes conducted at the medical and physical education clinic in the city of Ufa, Republic of Belarus. Young athletes did not show a significant difference in morbidity rates compared to controls. In the group of trained athletes, the incidence rate was significantly higher than in the control group ($p<0.05$). The main share of chronic diseases in trained sports players was detected from the central nervous system in the form of neurocirculatory dystonias, neuroses and neurasthenia and amounted to 37.1% per 100 examined. According to ECG data, reliable indicators of increased chronic overstrain of the circulatory system in trained athletes-players were determined, such as various conduction disorders and repolarization of the left ventricular myocardium (55.0% of cases); in 5.0% of cases, arrhythmia was detected (1.6% in the control), which may confirm the negative effect of increased physical activity on the body (Table 6).

**Conclusions.** The increased severity of work of team sports athletes, which belongs to class 3.3, necessitates increased health control measures, full medical and biological rehabilitation and additional social protection measures.

The increased severity of work of team sports athletes can reduce the level of adaptation of the athletes' body, compared to the control group, and have an adverse effect on the circulatory system and, in general, on the health of team sports athletes after five years of professional sports activity.

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***Table 6.*** *Some indicators of the health status of game sports athletes (case per 100 osm.) with experience up to 5 years and more than 5 years*

| Monitoring group | Number of inspections | Total disease cases | Chronic overstrain of the CS | Arrhythmic syndrome | CNS |
|---|---|---|---|---|---|
| **Experience – up to 5 years** | | | | | |
| Game sports | 34 | 52,9 | 21,4 | - | 23,5 |
| Control | 100 | 50,0 | 16,0 | 1,6 | 12,0 |
| **Experience – more than 5 years** | | | | | |
| Game sports | 35 | 117,1* | 55,0* | 5,0* | 37,1 |
| Control | 52 | 76,9 | 16,0 | 1,6 | 19,2 |

Designations: CS – *circulatory system, CNS – central nervous system.*

Note * – *The differences are statistically significant in relation to the control group, $p<0.05$.*

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**SCIENTIFIC NOTE**

# Training police officers in the situational use of physical force based on a differentiated approach

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**Key words:** *police, physical training, self-defense techniques, situations, differentiated approach to training, difficulty levels.*

**Introduction.** Police officers must be able to use physical force in various situations of self-defense and detention of criminals [1, 2]. However, as part of the professional training of police officers, a system of typical situations for the use of physical force by police officers has not yet been developed. The lack of a systematic perception of the content of situational training in the use of physical force does not allow modeling the educational process based on the didactic principle "from simple to complex."

**Purpose of the research** – identifying levels of difficulty in differentiating situations of the use of physical force by police officers.

**Research methodology and organization.** The study was conducted in 2023 on the basis of the Tyumen Institute for Advanced Training of Ministry of Internal Affairs employees. The study used scientific methods: analysis and generalization of situations of the use of physical force, modeling of situations of the use of physical force by police officers; pedagogical experiment, testing. At the end of the training period for employees from the EG and CG, the skills of using physical force in typical work situations were tested.

**Results and its discussion.** As a result of the analysis of situations where police officers used physical force in their official activities, two groups of situations were identified. The first group included situations that are universal for all police officers. The second group combined situations specific to the professional activities of individual job categories. Considering the process of development of learning in the direction from abstract to concrete, groups of situations are differentiated according to two levels of complexity: universal and specialized. Differentiation of situations by level of complexity was used and proved its effectiveness in structuring the content of physical training for students in the experimental group studying under professional training programs for the position of "Policeman". At the final lesson, students in the experimental group demonstrated a higher level of preparedness to act in situations (28.4% more than in the control group).

**Conclusion.** The results of the study revealed that training in the situational use of physical force will be effective, provided that situations of the use of physical force are differentiated according to two levels of complexity: universal and specialized.

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# Prevention and rehabilitation of muscle hypotonicity of vertebrogenic origin during preparation for the main competitions of the season

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**Abstract**

**Objective of the study** was to develop a methodology for testing the muscular system of athletes and special regular physical exercises as a method of preventing muscle hypotonicity in the biomechanical parts of the muscular topography of athletes, built into the structure of training sessions.

**Methods and structure of the study.** To identify muscle hypotonicity, muscle testing methods (according to L.F. Vasilyeva), used in kinesiology, and methods of functional tests for lateroflexion were used. The study of the state of the muscular system was carried out with the participation of athletes specializing in basketball, swimming, water polo, and kickboxing. To correct muscle condition, special physical exercises were developed and used.

**Results and conclusions.** Long-term observations have revealed an important pattern, namely: spastic conditions in skeletal muscles occur the next day after consuming sugar, rice and flour products in increased quantities, especially against the background of high physical activity during the period of centralized training. The developed and tested system of physical exercises allows not only to eliminate impaired muscle tone, but also to prevent the entire complex of dystrophic disorders in the muscular system of the spine.

***Keywords:*** *hypotonia, functional muscle disorders, functional tests, physical exercises, correction of disorders.*

**Introduction.** The nature of sports activity forms a specific muscle topography with coordinated work of synergist-antagonist muscles, functional disorders in which prevent the maximum realization of the accumulated potential. In critical cases, disorders of vertebrogenic genesis can lead to the risk of trauma, various syndromes, including cardiac ones, and even sudden cardiac death. This problem was raised by top-level management (O.Yu. Vasilyeva, 2017). Thus, the study of functional muscle disorders has both sports and medical significance.

In human physiology, a phenomenon called the "Genetsinsky-Orbely effect" is known [3]. It lies in the fact that skeletal muscles are innervated not only by the nerves of the central nervous system, but also by the nerves of the sympathetic nervous system, which control muscle metabolism. Electrical stimulation of these nerves does not cause muscle contraction, but does cause a reduction in fatigue caused by strenuous work. Conversely, compression of these nerves leads to weakening of muscle effort. In relation to the heart, the so-called vertebro-cardiac syndromes are known - heart rhythm disturbances: bradycardia, compensatory tachycardia, atrial extrasystole and temporary heart failure [2, 5]. These disorders are caused by compression of the sympathetic nerves that control the heart as they exit the spine as they pass between the spasmodic intervertebral muscles. Unlike motor and sensory nerves, the nerves of the sympathetic nervous system do not have a strong myelin sheath

and are easily compressed. Spastic conditions of the intervertebral muscles periodically occur during physical overload and can cause disturbances in the functioning of internal organs.

In sports practice, the effects of weakening the force of muscle contraction are observed. This is a phenomenon of muscle hypotonicity [1]. These conditions periodically occur in athletes and can be eliminated with the use of special corrective exercises.

**Objective of the study** was to develop a methodology for testing the muscular system of athletes and special regular physical exercises as a method of preventing muscle hypotonicity in the biomechanical parts of the muscular topography of athletes, built into the structure of training sessions.

**Methods and structure of the study.** To identify muscle hypotonicity, muscle testing methods (according to L.F. Vasilyeva) [1] used in kinesiology, methods of functional tests for lateroflexion, and manual muscle testing were used. Specially designed physical exercises were used to correct the condition of the muscles.

20 basketball athletes and 10 swimmers aged 22–24 years took part in examinations of the condition of the spinal muscular corset in 2016. The study of muscle hypotonicity was carried out at training camps in 2022 of the Russian men's national water polo team - 22 athletes and kickboxing (women, men) 18 athletes aged 19-27. In 2023, 30 junior water polo players aged 13 to 17 years were also examined.

**Results of the study and discussion.** To identify ***spastic conditions of the intervertebral muscles***, functional tests for lateroflexion were used. A study conducted on 20 basketball athletes showed that only six players did not have areas of intervertebral muscle blockage.

The examination was carried out using functional tests for lateroflexion and manual diagnostics of the spinal muscles. During lateroflexion, the subject had to inhale and stretch his bent elbow upward so as to tilt to the side along the entire length of the spine in one direction and the other. Using points placed on the projections of the spinous processes after photographing the back, the angles of bending in each segment of the spine were measured. A diagram based on the measured angles allows you to detect and graphically display areas of the spine with reduced mobility of the spinal motion segments.

Manual diagnosis was carried out by applying pressure with vibration to the paravertebral areas of the back at a distance of 2 cm from the line connecting the projections of the spinous processes. Pressure

*An example of measuring the mobility of spinal segments. The athlete's left upper and middle thoracic spine are blocked. This athlete has been experiencing back pain for more than a year. The athlete on the right has good mobility of the upper thoracic spine. There is no pain in the back*

was applied to areas of the intervertebral muscles, i.e. between the spinous processes of the vertebrae. The figure shows examples of functional tests of athletes.

Measuring the angles at which the spine can bend when bending to the side showed the presence of areas with limited mobility of the vertebral motor segments or their complete immobility (see figure, left photo). Normally, the mobility of the spinal motion segments should be 5 degrees. The first athlete examined had a completely blocked upper thoracic spine and hypermobility of the thoracolumbar junction. In the second athlete, the mobility of the vertebral motor segments is only slightly reduced (see figure, right photo).

For some athletes who had back pain, MRI examinations of the thoracic spine were performed. In areas of the spine with blocked spinal segments, changes in the condition of the intervertebral muscles were found. These muscles had an attenuated response on T1-weighted images (dark tone image, close to water tone). This indicates a lower proportion of lipids and a higher proportion of water in muscle structures. These changes are considered as a manifestation of long-term spastic conditions of the intervertebral muscles.

Muscle blocks in the spine often occur during physical overload and can persist for months or years. With the help of special exercises, muscle blocks can be easily eliminated.

An examination of water polo athletes for lateroflexion showed that out of 30 juniors, 10 had areas of low mobility of spinal segments in the upper thoracic region or, less commonly, in the lower thoracic region. However, palpation of the deep back muscles did not reveal painful muscles. Nine juniors had reduced lateroflexion without muscle flanks. This suggests that spastic conditions of the intervertebral muscles occur already in adolescence. And these conditions are easily reversible with the help of corrective exercises [6].

Study of hypotonicity of the muscles of the trunk, the belt of the upper and lower extremities. 22 athletes of the Russian national water polo team and 18 athletes of the Russian national kickboxing team were examined for the presence of hypotonicity of the muscles of the limbs and torso. Of the 40 athletes, 16 water polo athletes and 10 kickboxing athletes had hypotonicity in antagonist muscles that determine the effectiveness of working movements. During the two-week period of training camps, water polo athletes were given a set of special exercises built into the structure of the training sessions. An example of exercises built into the warm-up structure of water polo players in the gym and in the water:

- initial standing position, legs are fixed with a rubber band, the left arm with the band is bent at the elbow joint. Perform abduction-adduction with your right leg, rotation in a circle to the right, rotation in a circle to the left. The same right hand and left leg;

- starting position standing, feet shoulder-width apart, hands in front of you in a lock. Perform crunches stretching the rubber left and right with your hands behind your head;

- opposite direction on the back with one-touch passes to different hands: received and given, with a strong turn to the side;

- during aerobic swimming, breaststroke arms, without the help of leg movements.

In total, the complex included 15 exercises.

At the end of the training camp, 22 water polo athletes were re-examined. Hypotonia disappeared in all examined athletes.

A study of the mobility of spinal segments in athletes showed that more than 50% of athletes under the age of 25 have problems with the intervertebral muscles. The intervertebral muscles are responsible for the rigidity of the spine due to stable tone. But at the same time, these muscles must ensure flexibility of the spine in the lateral direction and rotation of the spine around its axis. If disturbances are detected in functional tests for lateroflexion, this means that it is the intervertebral muscles that are in a spastic state. This is the same factor that leads to pain syndromes in the back and degenerative processes in the intervertebral muscles, vertebrae and the spinal muscles themselves [6].

Examination of athletes for the presence of hypotonicity showed that in the surveyed sports, the majority of athletes had reversible changes in the functional state of the muscles.

For different types of sports activities, a specific profile of hypotonicity is assumed. The detected functional disorders of the muscles, in our opinion, are associated with the presence of muscle blocks in the spine. Removing muscle blocks in the spine helps eliminate episodes of muscle hypotonicity.

A study of the possibility of eliminating muscle hypotonicity shows the connection between the condition of the athlete's spine and his physical condition. The corrective exercises we proposed showed the possibility of correcting the condition of the spinal muscles and skeletal muscles.

We believe that muscle hypotonicity may be caused by compression of the sympathetic nerves innervating individual muscles in the lower segments of the neck and in the upper segments of the thoracic spine.

Conclusions. Studies of the mobility of spinal segments and manual diagnosis of areas of the spine with pain have shown that neurological syndromes in the back and spine are caused by spastic conditions of the intervertebral muscles. These conditions manifest themselves as muscle blocks in the muscular corset of the spine - an area of impaired mobility of several adjacent motor segments of the spine. Long-term observations have revealed an important pattern, namely: spastic conditions in skeletal muscles occur the next day after consuming sugar, rice and flour products in increased quantities, especially against the background of high physical activity during the period of centralized training.

The developed and tested system of physical exercises allows not only to eliminate impaired muscle tone, but also to prevent the entire complex of dystrophic disorders in the muscular system of the spine.

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# Historical aspects of arm wrestling development in the system of power sports

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**Abstract**

**Objective of the study** was to analyze the main historical aspects of the emergence and development of training and competitive processes in arm wrestling.

**Methods and structure of the study.** Scientific work is organized in accordance with the norms and rules for preparing and conducting descriptive research using the method of document analysis.

**Results and conclusions.** Many of the most important aspects of the history, theory, and methodology of arm wrestling remain poorly researched or at least not reflected on the pages of scientific publications. In our opinion, the presentation of arm wrestling as a socio-pedagogical system would help to eliminate, if not all, then most of the numerous gaps. In modern practice of Russian sports, the socio-pedagogical system of strength sports is brought into line with the specific social context.

***Keywords:*** *socio-pedagogical system, strength sports, arm wrestling, American and European versions, athleticism, strength combat.*

**Introduction.** Due to the labor-intensive nature of the training process and its results, one of the most recognized and professional types of strength training is deservedly arm wrestling, which could be called the right-wing strength direction of the sport. The health hazard and the resulting mandatory systemic organization of arm wrestling require us to look at it not just as a hobby, but as a clearly expressed, although not widely understood, social-pedagogical system.

The appearance in the literature of the concept of a socio-pedagogical system of a sport or an entire sports direction is determined, firstly, by the fact of the unconditional and pronounced socio-historical origin of any sport [12], which, despite the apparent external homogeneity and social neutrality of sport as a whole, indicates the close connection and dependence of the development of certain parts of it on a specific social context [1-10, 12]. Secondly, based on the fact that pedagogy is a targeted systemic influence on an individual, aimed at the formation and/or correction of a set of given social parameters [11], the concept of a socio-pedagogical system allows us to identify and take into account what pedagogical means and which ones Personality parameters of this or that sport are intended to explicitly or implicitly form and/or adjust [ibid]. Thirdly, the application of the concept of a socio-pedagogical system of a type or direction of sport, as well as sport in general, allows us to scientifically build social policy and social forecast in the field of physical culture and sports, which is especially important in a situation of competition and struggle between states in the external political arena.

Thus, the relevance of the topic of the material presented below, on the one hand, is determined by popularity, mass appeal, social impact on the individual and lifestyle, unsafety for the body, systematic organization of arm wrestling, and the important niche that this sport occupies among other types of strength training. On the other hand, the relevance of the topic under consideration is determined by the potential application of the concept of the socio-pedagogical system of sports.

The scientific problem of the study is the fact that the topic of analysis of arm wrestling as a socio-ped-

agogical system is characterized by some ambiguity, perhaps even inconsistency in its interpretation, since there are enough followers of arm wrestling (strength combat) not only among athletes, but also among representatives of disadvantaged groups [3].

Objective of the study was to analyze the main historical aspects of the emergence and development of training and competitive processes in arm wrestling.

**Methods and structure of the study.** Scientific work is organized in accordance with the norms and rules for preparing and conducting descriptive research using the method of document analysis.

**Research results and discussion.** To perceive arm wrestling only as a sport would be too narrow. Arm wrestling is one of the youngest types of strength competitions, only partially adapted to modern sports, born from the game transformation of labor and military practices and the culture of bodily and motor activity in lifting and carrying heavy objects: pets, stones, logs, hunting and military trophies. Today, arm wrestling, as a specific body-motor culture that unites millions of people, belongs not only to sports. In addition to the already traditional sports model, arm wrestling simultaneously has several more social models and development prospects, known as:

- discipline of physical culture and education;
- a form of festive and gaming mass leisure and recreation;
- a program to maintain the physical health and active longevity of veterans, that is, people in old age, in their seventh and even eighth decade of life;
- form and program of social rehabilitation for people with disabilities;
- subculture of professional strength martial arts arm wrestling.

What unites all these models? According to the apt expression of Denis Tsyplenkov, one of the respected veterans and organizers of arm wrestling and arm lifting competitions, all these models are represented by "severe people who, in gloomy basements with hard hard work, achieve colossal results in arm wrestling." It seems to us that this phrase very accurately and succinctly expresses the socio-psychological portrait of a typical "arm wrestler", and, consequently, the pedagogical influence on the individual from systematic arm wrestling training.

As for scientific publications in the field of arm wrestling, the situation here is quite deplorable: firstly, there are very few such publications; secondly, they concern only methodological aspects, and even then not all of them; thirdly, even these moments are closely connected with the Internet and are presented in its characteristic advertising and commercial style, often theoretically and methodologically completely illiterate. With extremely rare exceptions, there are no publications at all about the socio-pedagogical system of armwrestling, its philosophy and psychology, which calls into question the existence of the scientific methodology of armwrestling [3]. However, it would be advisable to mention some publications.

Of course, one of the best teaching aids on power wrestling and arm wrestling in Russia is the book by Nikulin, Matyushenko, Posokhov: "Strength abilities in arm wrestling. Main trends, assessment of features and manifestations." Where the scientific foundations of the training process for developing strength in the hands were presented in quite accessible language.

The works of Yu.V. Dragnev, P.V. Zhivor, A.I. Rakhmatov, E.I. Usanov, L.V. Chukin also deserve some attention. All of this literature, although sometimes makes it possible to consider arm wrestling in the context of the evolution of strength martial arts sports [3], however, generally also does not go beyond the scope of methodological recommendations and autobiographical narratives. A huge number of the most important aspects of the history, theory, and methodology of arm wrestling remain unexplored or at least not reflected on the pages of scientific publications. In our opinion, the presentation of arm wrestling as a socio-pedagogical system would help to eliminate, if not all, then most of the numerous gaps.

A brief summary of the history of the world development of arm wrestling in the context of the topic of our research is as follows.

- according to one version, the birthplace of arm wrestling is the USA, officially recognized in 1952 in Petolumo by Bill Soberenes, the founder of arm wrestling;
- according to another version, the birthplace of arm wrestling is England, where in ancient times, instead of fist fights, knights and ordinary townspeople resorted to arm wrestling

**Conclusions.** It is not surprising that the socio-pedagogical system of power arm wrestling today looks contradictory, because it was formed in parallel in the USA, Western and Eastern Europe, moreover, under different socio-economic systems, under the influence of different worldviews and ideologies.

It must be admitted that the most organic, that is, the most fully and accurately corresponding to a spe-

cific social context, was originally and still is the American version of the socio-pedagogical system of arm wrestling. Other Western and Eastern European versions of this system, with greater or lesser corrections, gradually transformed into the American version of the socio-pedagogical system of power wrestling (arm wrestling) with its real and effective focus on private capital, market competition and self-promotion, individualism and the cult of Superman.

European technical techniques, methods and technologies have also undergone corresponding degrees of transformation and adaptation, as historical experience shows, closely, although not very clearly dependent on worldview and ideological foundations, for example, on American pragmatism.

Our domestic model of the socio-pedagogical system of power arm wrestling has undergone a particularly strong transformation.

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# From the unified games of the special olympics to the inclusive games of the future

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**The purpose of the study** – to identify the prerequisites for the expediency of the development of inclusive digital sports.

**Methodology and organization of the study.** The results of the Unified Games of the 2023 Special Olympics in Kazan are analyzed. A sociological survey of specialists and parents was conducted in order to study the opinion on the expediency of developing inclusive digital sports among people with mental disabilities.

**The results of the study and conclusions.** The integration of sports and computer technologies based on functional and digital dual sports will have multifaceted significance for people with intellectual disabilities, helping to improve physical and mental health, increase individual and social activity.

***Keywords:*** *Special Olympics (SO), persons with intellectual disabilities (IN), inclusive digital sports.*

**Introduction.** The involvement of persons with intellectual disabilities in physical culture and sports activities is one of the priority areas for the development of adaptive physical culture and adaptive sports [1]. Due to the cancellation of the World Winter Games of the Special Olympics in Russia, the Unified Games were held in Kazan from January 21 to 27, 2023 (the Games), which made a significant contribution to changing the attitude of society towards "special" athletes.

Competitions of an innovative large-scale format (simultaneously in ten summer and eight winter sports for people with intellectual disabilities) were held in our country for the first time. The participants were 59 sports delegations from Russian regions and the team of the Republic of Belarus. The purpose of the Games is to help people with disabilities adapt to life in society and become full–fledged citizens. In solving this problem, the Russian Special Olympics (SOR) systematically promotes the ideas of inclusive sports.

The purpose of the study is to identify the prerequisites and expediency of the development of inclusive digital sports.

**Methods and organization of research.** As part of this direction, the Tatarstan regional branch of the SOR has developed the project "Inclusive Games of the Future". The essence of the project is the development of digital sports and the holding of the first festival of inclusive digital football with the participation of athletes with intellectual disabilities. The prerequisites for the creation and implementation of the project were the need for inclusivity and digital transformation in sports. The innovative idea was confirmed by the results of a sociological survey of coaches (n-46) and parents of children with IN (n-32).

**The results of the study and conclusions.** According to the majority of respondents (94%), digital sports has significant prospects. The multi-user mode of this sports computer technology, which includes physical training and cognitive tasks, will contribute to the development of communication, psychophysical qualities and social skills in people with intellectual disabilities.

Conclusions. Digital sport promotes inclusion and the creation of equal opportunities for all participants. This sports digital technology will help people with disabilities develop psychophysical conditions, form teamwork skills, improve concentration and make decisions in rapidly changing situations.

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# Model of regional policy involving the population in systematical physical education and sports

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**Abstract**

**Objective of the study** was to develop a model of regional policy aimed at increasing the effectiveness of involving the population in systematic physical education and sports.

Methods and structure of the study. The work carried out: analysis of management functions, statistical data in form No. 1-FK, No. 3-AFK, No. 2-GTO, modeling, pedagogical design.

**Results and conclusions.** Based on the analysis and systematization of official data from Rosstat statistical indicators for the period 2018-2022. The article presents a model of regional policy aimed at increasing the effectiveness of involving the population in systematic physical education and sports. The developed model is the basis for the formation of programs, technologies and mechanisms for involving (motivating) the population in systematic physical education and sports in the regional space.

***Keywords:*** *physical education, regional policy, model, pedagogical design, involvement, physical activity, systematically engaged.*

**Introduction.** Improving the system of physical culture and sports is based on the priority directions of state policy in this area to create conditions for involving citizens in systematic physical culture and sports [2].

Over the last decade, regulations have been developed and entered into force that have determined the directions for the development of regional policy in the field of physical culture and sports to stimulate the physical activity of Russians, which, among other things, provide for the implementation of special measures aimed at increasing the physical activity of the population [1]. Thus, the Strategy for the Development of Physical Culture and Sports in the Russian Federation for the period until 2030 defines its long-term orientation, including taking into account digital development [2].

One of the directions in the implementation of regional policy to involve citizens in systematic physical education and sports is systemic pedagogical design, which makes it possible to develop person-oriented training programs taking into account specific target tasks based on digital platforms [3].

To improve this process, within the framework of scientific, methodological and expert-analytical support for physical culture and sports activities, in 2023, the Federal State Budgetary Institution Federal Science Center of Physical Culture and Sport (VNIIFK), developed a model of regional policy aimed at increasing the efficiency of involving the population in systematic physical education and sports. This model involves providing support for: a variety of forms and types of physical activity; pedagogical design of motor activity; methodological support for practice-oriented planning of physical activity, taking into account the level of physical fitness, age periodization, gender characteristics and health status; individual assessment of the level of physical fitness.

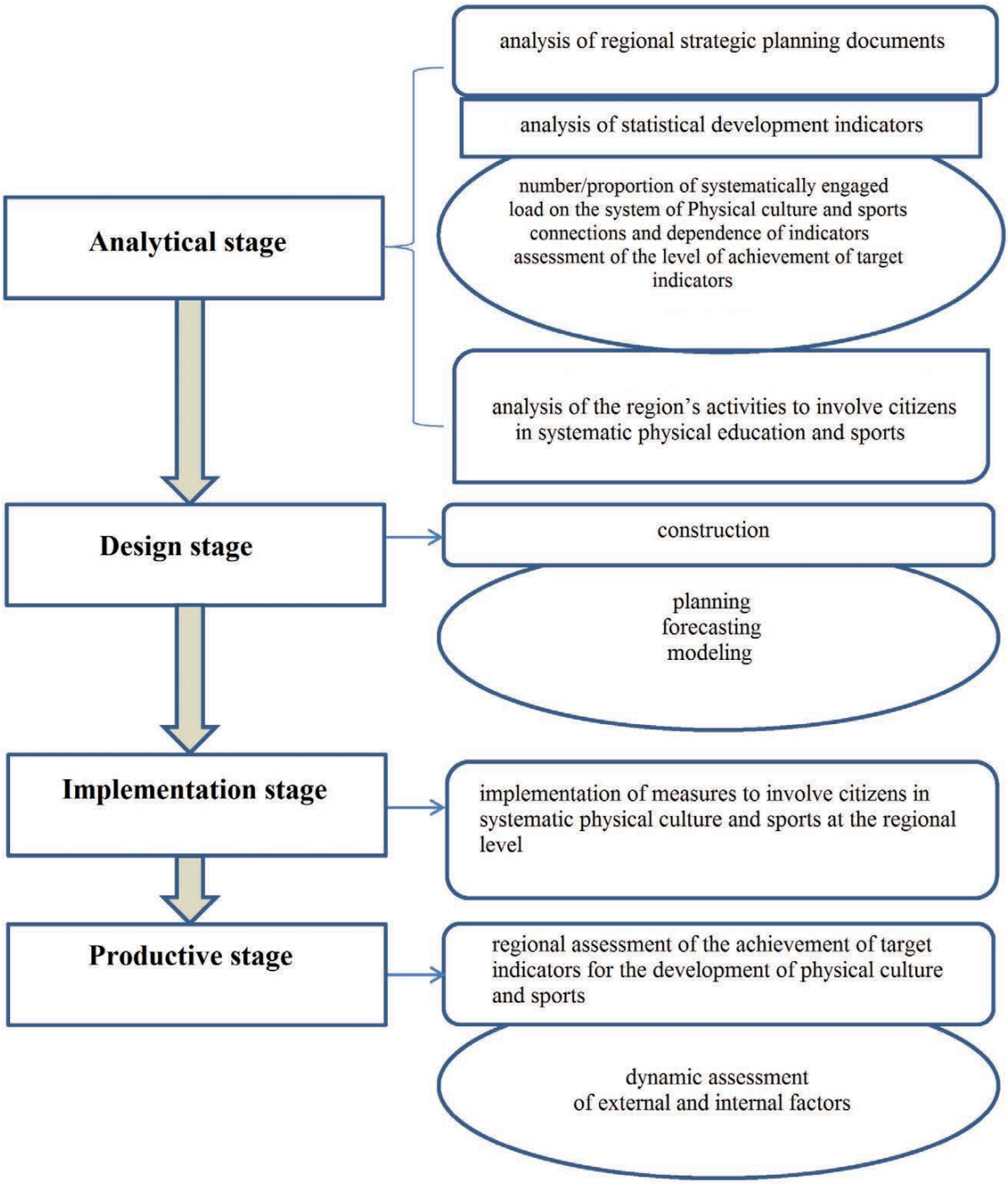
Due to the fact that physical education of the population is a complex multifactorial process that takes into account sociocultural, psychological, pedagogical, technological, organizational and managerial as-

pects and individual characteristics of a person as a subject of implementation, which is focused on the mass coverage of various categories of citizens in physical culture and sports activities, then designing a model for involving the population in physical education and sports is a pressing issue in modern theory and methods of physical education of the population.

**Objective of the study** was to develop a model of regional policy aimed at increasing the effectiveness of involving the population in systematic physical education and sports.

**Methods and structure of the study.** The work carried out: analysis of management functions, statistical data in form No. 1-FK, No. 3-AFK, No. 2-GTO, modeling, pedagogical design.

**Results of the study and discussion.** The model is intended for a comprehensive assessment of the activities of a constituent entity of the Russian Federation




*The structure of a regional policy model aimed at increasing the effectiveness of involving the population in systematic mass physical education and sports*

to involve the population in systematic physical education and sports through a system of various activities, including organizational, managerial, information and propaganda activities. This takes into account: the number of people systematically involved in physical culture and sports, who have started and completed tests of the GTO complex, as well as the provision of the process of physical culture and sports (personnel, medical, material and technical), which makes it possible to design and regulate the process of involving the population in physical culture and sports, physical education, recreational and tourism activities at the municipal and regional levels.

The model indicators were determined in terms of the target indicator of the federal project "Sport is the norm of life" - the proportion of citizens systematically involved in physical culture and sports [4].

The structure and description of the regional policy model aimed at increasing the effectiveness of involving the population in systematic physical education and sports are presented in the figure. The model includes the main logically interconnected components of the design process: analytical; design; implementing; productive.

*The analytical component includes:*

- general analysis of the current state of development of the sphere of physical culture and sports in the region. At this stage, the results of the implementation of government programs are analyzed, the level of achievement of target indicators is assessed, key challenges are identified, potential areas of development are identified, existing limitations are described, and risks are identified. It is recommended to compare the results obtained with all-Russian indicators and indicators of regions similar in population, territory, and socio-economic characteristics;

- analysis of development indicators in the sphere of physical culture and sports and forecasting. At this stage, an analysis is carried out of the number of citizens systematically involved in physical culture and sports, as well as the annual increase in absolute and percentage terms;

- analysis of the number of citizens systematically involved in culture and sports by age group, as well as annual growth in absolute and percentage terms by age group;

- a comprehensive analysis of the load on the system of physical culture and sports, including consideration of the dynamics of changes in the number of: institutions, enterprises, associations, organizations on the basis of which physical culture, health and sports work is carried out; sports facilities, taking into account urban and recreational infrastructure facilities adapted for physical education and sports; workload and capacity of sports facilities, taking into account urban and recreational infrastructure facilities adapted for physical education and sports, staffing in the field of physical education and sports, including sports facilities. Connections and dependencies between indicators are determined, and the contribution of individual activities to changes in indicators is assessed.

*The design component includes:* making forecasts for the involvement of citizens in systematic cultural and sports activities, including the achievement of target indicators; development and adjustment of planned values of target indicators; risk identification; development of a regional (municipal) program for involving (motivating) the population in systematic physical education and sports, mechanisms for involving (motivating) citizens in systematic physical education and sports, taking into account the specifics of the region; determining a list of mandatory performance indicators for involving citizens in systematic physical education and sports at the regional and municipal levels.

Implementing component: implementation of programs, technologies and mechanisms for involving (motivating) citizens in systematic physical education and sports in the regional space.

Effective component: dynamic assessment of the implementation of programs, technologies and mechanisms of activities to involve (motivate) citizens in systematic physical education and sports, and determine directions for further improvement of mechanisms of involvement (motivation) in the region.

*A system of measures to increase the involvement (motivation) of citizens in systematic physical education and sports may include:*

- application in practice of the results of sociological studies of population satisfaction with the conditions for physical education and sports;

- information and propaganda activities (promotion of a healthy lifestyle, the positive impact of physical activity on various spheres of human life);

- interdepartmental coordination of bodies governing physical culture and sports, education, health care, culture, labor and social protection, large employers;

- training, retraining and advanced training of management personnel for the effective organization of

physical culture and sports activities among citizens of the region.

**Conclusions.** Thus, the application of the developed model of regional policy to increase the effectiveness of involving citizens in systematic physical education and sports will allow the constituent entities of the Russian Federation to improve the development of physical culture and sports in the region, identify positive and negative factors (and promptly eliminate the latter); rational use of sports infrastructure, taking into account the interests and needs of the population, which will increase the coverage of citizens systematically involved in physical culture and sports; assess physical condition and unify the choice of a rational motor mode using the information system “Formation of practice-oriented recommendations for planning physical activity, taking into account the initial level of physical fitness, age periodization, gender characteristics and health status.” The implementation of these components of the model will ensure the achievement of target indicators of state policy in the field of physical culture and sports.

Based on the results of the study, methodological recommendations were developed for the constituent entities of the Russian Federation, aimed at increasing the efficiency of involving citizens in systematic physical education and sports, taking into account current trends in the development of approaches to organizing physical education and sports, including the system of training the population within the framework of the All-Russian physical culture and sports complex "Ready for work and defense".

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# Consumer preferences and quality of services in the field of physical culture and sports

UDC 796

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**Abstract**

**Objective of the study** was to analyze consumer opinions on issues of interests and motivation for physical culture and sports, the quality of physical education and health services in the Russian Federation.

**Methods and structure of the study.** The materials of the scientific work were received at the Siberian State University of Physical Education and Sports in the process of fulfilling a state assignment on the topic "Development of a standard model for the provision of physical education and health services by non-governmental organizations, including the procedure for monitoring their quality and methodological recommendations for their implementation" (2023). Methods: theoretical analysis and synthesis of data from scientific and methodological literature, questionnaires, comparison, generalization, structuring, analysis and synthesis. The survey was conducted using Google forms (using a developed questionnaire of 20 questions) during 2023 with the participation of 5,550 people of different ages living in different regions of the Russian Federation.

**Results and conclusions.** The analysis made it possible to identify the preferences of different age groups of the population when choosing the type, form, place for physical culture and sports at the present stage. The most popular types of physical activity were identified (exercises in the gym, fitness club and swimming pool, playing team sports, running and Nordic walking, winter sports). Problematic aspects have been identified that limit the involvement of people in regular physical culture and sports, including reduced motivation to exercise, an insufficient number of sports facilities in the immediate vicinity of their place of residence or work, and the rather high cost of classes for a certain part of people.

***Keywords:*** *physical education and health services, physical activity, physical culture, sports, population of the Russian Federation.*

**Introduction.** At the present stage, meeting the needs of the population of the Russian Federation for physical activity is implemented in a wide variety of forms and types of activities: sports training, additional forms of physical education for children and adolescents, fitness, classes in health clubs, online classes, etc. Researchers note the importance of a multilateral consideration of the problem involvement of the population in regular physical education and sports, including economic, logistical, managerial, social aspects [1-6]. To achieve the planned indicators of population involvement in physical education and sports, indicated in the program state documents of the Russian Federation, a detailed analysis is necessary interests and preferences of different age groups of the population in this area, identifying the reasons and problematic aspects that limit the expansion of the number of people involved in sports.

**Objective of the study** was to analyze consumer opinions on issues of interests and motivation for physical culture and sports, the quality of physical education and health services in the Russian Federation.

**Methods and structure of the study**. The materials of the scientific work were received at the Siberian State University of Physical Education and Sports in the process of fulfilling a state assignment on the

topic "Development of a standard model for the provision of physical education and health services by non-governmental organizations, including the procedure for monitoring their quality and methodological recommendations for their implementation" (2023). Methods: theoretical analysis and synthesis of data from scientific and methodological literature, questionnaires, analysis of statistical materials (report of the Ministry of Sports 1-FC for the Russian Federation for 2022), comparison, generalization, structuring, analysis and synthesis. The survey was conducted using Google forms (based on a developed questionnaire of 20 questions) during 2023 with the participation of 5,550 people of different ages living in different regions of the Russian Federation (a total of 8 federal districts were covered: Central (148 people), Northwestern (1081 people), Southern (45 people), North Caucasian (126 people), Volga (162 people), Ural (1981 people), Siberian (1519 people), Far Eastern (364 people)).

**Results of the study and discussion.** The survey conducted made it possible to identify current trends in the field of physical culture and sports in the regions of the Russian Federation. It was revealed that only about 33% of respondents practice different types of physical activity in their daily life. At the same time, 24% of respondents prefer independent studies (Table 1). Swimming pool activities are the most popular (except for the North Caucasus Federal District), however respondents note an insufficient number of swimming pools located within accessible proximity to their place of residence or work in their regions.

Among respondents involved in physical education and sports, almost half (46.6%) prefer an independent form of exercise. Online classes, which have become quite widespread in the last 5 years, are practiced by 2.2% (Table 2).

An analysis of respondents' interests when choosing a type of physical activity showed that the most popular are exercises in the gym, fitness club and swimming pool (Table 3). A fairly large proportion of people choose to engage in team sports, running and Nordic walking, and winter sports.

A study of the reasons limiting the inclusion of a sufficient amount of physical activity in the life cycle of citizens of the Russian Federation showed that only about 4% of people do not feel the need for regular exercise, about 33% are involved in physical education and sports, the rest of the respondents indicated various reasons that prevent them from engaging in physical culture and sports (Table 4). A significant portion of the respondents indicated financial difficulties, laziness, and lack of willpower as such reasons. However, such reasons indicate reduced motivation to exercise, which leads to the conclusion that it is necessary to search for effective approaches in this direction. More

*Table 1. Consumer preferences when choosing a place for physical education and sports (%)*

| Federal district | Fitness club/ studio | By yourself | Club at your place of residence | State institutions | Private organizations | Online | Pool | Stadium | Park area | Your own answer |
|---|---|---|---|---|---|---|---|---|---|---|
| Central | 16 | 24 | 3 | 12 | 9 | 2 | 18 | 6 | 8 | 2 |
| Northwestern | 13 | 22 | 5 | 12 | 6 | 2 | 18 | 11 | 8 | 3 |
| Southern | 14 | 18 | 6 | 8 | 9 | 3 | 20 | 16 | 3 | 3 |
| North Caucasian | 14 | 25 | 7 | 17 | 5 | 1 | 7 | 15 | 6 | 3 |
| Privolzhsky | 17 | 21 | 2 | 18 | 4 | 3 | 14 | 9 | 9 | 3 |
| Ural | 10 | 27 | 5 | 12 | 6 | 3 | 17 | 10 | 6 | 4 |
| Siberian | 13 | 23 | 6 | 16 | 5 | 2 | 17 | 9 | 7 | 2 |
| Far Eastern | 12 | 25 | 5 | 12 | 6 | 2 | 10 | 16 | 7 | 5 |
| Russian Federation | **12** | **24** | **4** | **13** | **6** | **2,5** | **17** | **10** | **7** | **3** |

*Table 2. Respondents' preferences when choosing the form of organizing physical education and sports classes (according to survey data in the Russian Federation, n=5500 people)*

| Answer options | Number of persons | % |
|---|---|---|
| By yourself | 2528 | 46,6 |
| With an individual trainer | 903 | 16,6 |
| I prefer group classes | 1876 | 34,6 |
| I prefer online classes | 119 | 2,2 |

*Table 3. Respondents' preferences when choosing the type of physical activity (according to survey data in the Russian Federation, n=5500 people)*

| Answer options | Number of persons | % |
|---|---|---|
| Exercises in the gym | 1803 | 17,1 |
| Hall of active group programs (steps, fitballs, aerobics) | 807 | 7,7 |
| Hall of calm group programs (yoga, Pilates, stretching) | 706 | 6,7 |
| Dance hall (various directions) | 407 | 3,9 |
| Hall for team sports (volleyball, basketball, football, badminton, tennis) | 986 | 9,3 |
| Spa center (swimming pool, sauna, massage) | 949 | 9 |
| Pool | 1996 | 18,9 |
| Ski center | 352 | 3,3 |
| Winter sports (figure skating, hockey, cross-country skiing) | 782 | 7,4 |
| Running, Nordic walking | 817 | 7,7 |
| Martial arts | 280 | 2,7 |
| Your own option | 661 | 6,3 |

*Table 4. Distribution of respondents' answers to the question "What prevents you from doing physical education and sports?" (according to survey data in the Russian Federation, n=5500 people)*

| Answer options | Number of persons | % |
|---|---|---|
| Nothing bothers me, I'm working on it | 2399 | 33,9 |
| I don `t want | 300 | 4,2 |
| Lack of information | 141 | 2 |
| Health status | 482 | 6,8 |
| Material difficulties | 698 | 9,8 |
| Laziness, lack of willpower | 883 | 12,5 |
| Lack of free time | 1953 | 27,6 |
| Your own option | 231 | 3,3 |

than 27% of respondents indicate a lack of free time, which also apparently indicates a lack of motivation for classes and the need to expand the forms of professional-applied classes, as well as classes organized in close proximity to the place of residence or work.

A number of questions in the questionnaire covered problematic aspects of the quality of service provision in the field of physical education and sports. In particular, an analysis of respondents' satisfaction with the conditions for the implementation of classes was carried out. It was revealed that almost 20% of respondents consider the price of services to be too high (Table 5). A fairly large proportion of respondent's point to the distance from home or office of sports facilities (14%), as well as to the insufficient number of sports facilities (13%). This information also correlates with the answers to the question - "What factors are the most significant for you when choosing a place/organization for physical education and sports?", since about 17% indicated that the price of classes is the determining factor when choosing a place for classes, and 20% of respondents named the location of the sports facility as such a factor. About 10% of respondents are not satisfied with the equipment and inventory (outdated or poor quality), about 6% of respondents indicate non-compliance with sanitary standards in halls, locker rooms and other premises. It should be noted as a problematic aspect the low qualifications of the trainer or instructor, which was noted by almost 7% of respondents (Table 5).

A study of the involvement of children and adolescents aged 3-15 years in regular sports activities was carried out according to the summary report of the 1-FK for the Russian Federation for 2022. In particular, it was revealed that 17.3% of children and teenagers 3-15 years old, which is not a high enough indicator; an even lower percentage of children of this age are engaged in children's and teenage clubs (2.6%).

**Conclusions.** The conducted research made it possible to identify the preferences of different age groups of the population when choosing the type, form, place for physical education and sports at the

*Table 5. Distribution of respondents' answers to the question "What does not satisfy you when doing physical education and sports?" (%)*

| Federal district | Central | North-West | South | North Caucasus | Privolzhsky | Ural | Siberian | Far Eastern | Russian Federation |
|---|---|---|---|---|---|---|---|---|---|
| High price | 23 | 21 | 19 | 15 | 18 | 18 | 20 | 18 | **19,4** |
| Low qualification of trainer/instructor | 7 | 6 | 9 | 7 | 9 | 6 | 8 | 6 | **6,9** |
| Far from home/office | 13 | 14 | 4 | 19 | 14 | 13 | 16 | 12 | **14,2** |
| Unconvenient working hours | 11 | 10 | 12 | 12 | 12 | 12 | 11 | 10 | **11,2** |
| Old/poor quality equipment/inventory | 10 | 9 | 10 | 10 | 11 | 10 | 10 | 10 | **10,2** |
| Failure to comply with sanitary standards in halls and locker rooms | 8 | 6 | 5 | 3 | 7 | 6 | 8 | 6 | **5,9** |
| Lesson programs do not take age into account | 4 | 4 | 4 | 1 | 3 | 4 | 3 | 4 | **3,2** |
| The load is too high for me | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 2 | **2** |
| Uninteresting/ monotonous activities | 3 | 2 | 4 | 3 | 3 | 3 | 3 | 4 | **2,7** |
| Few sports facilities/ halls, etc. | 9 | 15 | 11 | 15 | 9 | 14 | 10 | 16 | **13,1** |
| There are no programs for my age and skill level | 6 | 4 | 5 | 4 | 3 | 5 | 3 | 7 | **4,6** |
| Your own option | 4 | 7 | 7 | 10 | 9 | 7 | 6 | 5 | **6,5** |

present stage. The most popular types of physical activity were identified (exercises in the gym, fitness club and swimming pool, playing team sports, running and Nordic walking, winter sports). Problematic aspects have been identified that limit the involvement of people in regular physical education and sports, including reduced motivation to exercise, an insufficient number of sports facilities in the immediate vicinity of their place of residence or work, and the rather high cost of classes for a certain part of people. It should be noted that there are insufficiently high rates of involvement of children and adolescents in regular sports activities. The identified problematic aspects can serve as material for the formation of immediate and long-term plans aimed at ensuring wider involvement of the population in physical education and sports.

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# The role of physical culture and sports activities in the formation of civil and professional identity among cadets

UDC 378

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**Abstract**

**The purpose of the study.** To determine the place and role of physical culture and sports activities in the process of forming the civil and professional identity of law school cadets.

**Methodology and organization of the study.** The structure and orientation of the process of forming the civil and professional identity of law school cadets has been established. Through the study of special literature, sociological research and analysis of their own experience, the main indicators of the effectiveness of physical culture and sports activities in this process are determined.

**The results of the study and conclusions.** Physical culture and sports activities have a prominent place and role in the formation of the civil and professional identity of law school cadets. It contributes to the formation of physical and psychological endurance, the development of social skills, building corporate spirit and familiarization with social values, fostering patriotism and civic responsibility.

***Keywords:*** *civil and professional identity, law school cadets, physical culture and sports activities.*

**Introduction.** The problem of civic identity, especially taking into account its ethnic and confessional components, has been raised relatively recently in Russian science. In the context of the modern global socio-political crisis, the value of the process of forming the civil and professional identity of law school cadets has increased significantly, the role of which is due to a number of factors:

1. Successful career: A strong civil and professional identity is an important factor for success in a professional career. Law school cadets who have such an identity are more likely to become successful lawyers and achieve high results.

2. Professional satisfaction: The development of a civic and professional identity helps cadets feel connected to their chosen profession and experience satisfaction from their work. This increases motivation and promotes continued professional development.

3. Social contribution: Cadets who develop a civil and professional identity make an important social contribution to society. They promote justice, respect for rights and promote the development of the rule of law. Such lawyers can become drivers of positive changes in society.

The task of the first stage of the study was to establish the structure and orientation of the process of forming the civil and professional identity of law school cadets. In order to properly build the process of forming a civil and professional identity among law school cadets, it is necessary to form an idea of its substantive essence and structural components. Since civil-professional identity is a complex and multicomponent psychological and pedagogical phenomenon integratively including the personal qualities and professional competencies of a future employee of the internal affairs bodies of the country, an integrated and

synergetic approach to its formation is necessary [2, 3]. This task led to a special study in this area, which began with an analysis of the definitions available in the scientific and methodological literature [1].

Methodology and organization of the study. It should be noted that in the scientific field we have not found a comprehensive definition of this quality. In the literature, the means of forming such socio-psychological foundations of personality as civil and professional identity are presented in the form of independent aspects. We believe that it is necessary to integratively develop these two characteristics, especially among representatives of law enforcement agencies, which are the basis of state security and stability in modern Russian society. Performing important functions in maintaining law and order, protecting the interests of the state, ensuring the safety of citizens and combating various threats requires specialists not only professional competence, but also deep dedication to the citizens of their country and their civic duty.

Civil identity is a concept that refers to the consciousness and self-awareness of a person as a citizen of a certain state or society. It includes a sense of belonging and acceptance of certain values, norms and customs that are characteristic of a given state or society, as well as an understanding and awareness of one's rights and duties as a citizen, including a willingness to protect the interests of one's country.

The structure of the civil identity of law school cadets can be diverse and depends on many factors, such as nationality, religion, cultural and social characteristics, education, etc.

The results of the study. We have identified several key aspects that characterize the civil identity of law students in a professional aspect (legal culture, civic responsibility, professional ethics, patriotism).

Professional identity consists in feeling part of the legal community and belonging to the legal profession.

Thus, summing up the concepts studied, we came to the conclusion that they reflect the complex of civil, professional and personal qualities of future lawyers, conditioned by the needs of the service.

Physical culture and sports activities occupy a significant place in the education of these qualities. In order to determine the role of sports, we conducted a survey (in the form of a conversation) of physical training teachers (n-10) in law schools. The analysis and systematization of answers to pre-posed questions made it possible to identify the main indicators of the effectiveness of physical culture and sports activities in the process of forming the civil and professional identity of cadets:

1. Improving the level of physical fitness. Sports activities allow cadets to be in good physical shape and ready to perform professional duties that carry a significant physical load.

2. Formation of the corporate spirit. The team format of sports training helps cadets develop skills of cooperation, communication and leadership.

3. The development of moral and ethical qualities. Sports activities can contribute to the development of qualities such as discipline, perseverance, responsibility and honesty.

4. Increase self-esteem. Getting involved in sports and achieving certain results helps cadets improve their self-esteem. This may be related to improving physical fitness, achieving athletic goals, or gaining recognition from colleagues.

5. Instilling sports values. Sport contributes to the formation of values such as fair play, justice, respect and discipline. These values are similar to the principles of law and support the development of civil identity among cadets.

**Conclusion.** Thus, the use of sports in the process of education and training of law school cadets helps them to form a civil and professional identity through the development of physical, moral and ethical qualities, as well as contributes to the formation of team spirit and sports values.

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# Designing fitness aerobics classes in physical education of university students

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**Abstract**

**Objective of the study** was to theoretically substantiate, develop a methodology and sets of exercises for female students doing fitness aerobics in physical education at a university and test their effectiveness in a pedagogical experiment.

**Methods and structure of the study.** The study involved 50 first-year students of the Siberian Federal University. Using a random sampling method, the students were divided into experimental and control groups of 25 people. The experimental group did fitness aerobics during physical education, and the control group followed a traditional program based on general physical training. To determine the effectiveness of physical education classes based on the design of fitness aerobics in comparison with the traditional form of physical education, physical fitness indicators were taken: 2000 m run; 100m run; flexion and extension of the arms while lying down; standing long jump; lifting the body from a lying position in one minute.

**Results and conclusions.** Based on the results of a year-long pedagogical experiment, the physical fitness indicators of the experimental and control groups were analyzed. The growth of the following indicators was analyzed: general endurance, speed endurance, strength indicators of the shoulder girdle, speed-strength indicators of the legs and strength indicators of the abdominal muscles. In all indicators of physical fitness, students from the experimental group engaged in physical education based on fitness aerobics outperformed students from the control group by an average of 17.6% ($P<0.05$). These results allow us to state the need to periodically include sets of exercises from fitness aerobics into the process of physical education to increase physical fitness indicators among female students in a yearly cycle.

***Keywords:*** *physical education, female university students, fitness aerobics, physical training, physical qualities.*

**Introduction.** One of the important tasks of physical education of students in universities is physical training as a basic component of effective academic work of students, active social activities, physical health and military-patriotic and labor readiness to act in the interests of the state. As the analysis shows, the current physical education curriculum does not effectively solve the problem of physical training of students, especially girls, in higher educational institutions of the country. More than 50% of female students at universities in the country have low levels of physical fitness; 60% of girls do not show interest in physical education at the university, they have a low level of motivation, etc. The inclusion of modern physical education, sports and recreational creative technologies, including fitness aerobics, in the physical education program content of university students will help increase motivation, activity and mass participation in physical culture and sports among young people, especially girls. Fitness aerobics classes form a creative and necessary psychofunctional portrait and image of a modern girl, which is what young people need to target and motivate in physical education at a university.

**Objective of the study** was to theoretically substantiate, develop a methodology and sets of exercises for female students doing fitness aerobics in physical education at a university and test their effectiveness in a pedagogical experiment.

**Table 1.** *Increase in physical fitness indicators of first-year female students in the experimental and control groups over the academic year, in %*

| Physical fitness indicators | Groups | September | May | Growth, % | P |
|---|---|---|---|---|---|
| | | $\bar{X} \pm \alpha$ | $\bar{X} \pm \alpha$ | | |
| 2000 m run, min/s | EG | 10.53±0,35 | 10.24±0,33 | 2,8 | (P<0,05) |
| | CG | 10.51±0,34 | 10.42±0,35 | 0,9 | (P>0,05) |
| 100 m run, s | EG | 17,2±0,4 | 16,3±0,3 | 5,3 | (P<0,05) |
| | CG | 17,1±0,3 | 16,8±0,2 | 1,8 | (P>0,05) |
| Standing long jump, cm | EG | 168,9±4,4 | 187,1±4,3 | 10,8 | (P<0,05) |
| | CG | 169,7±4,7 | 178,8±5,7 | 5,4 | (P>0,05) |
| Raising the torso from a lying position, in one minute | EG | 38,7±2,8 | 52,4±2,5 | 35,4 | (P<0,05) |
| | CG | 39,4±2,9 | 47,1±3,5 | 9,3 | (P>0,05) |
| Bending and extending the arms while lying down, number of times | EG | 12,8±1,5 | 17,1±1,3 | 33,6 | (P<0,05) |
| | CG | 12,7±1,4 | 14,8±1,7 | 16,5 | (P>0,05) |

**Methods and structure of the study.** The study involved 50 first-year students of the Siberian Federal University. Using a random sampling method, the students were divided into experimental and control groups of 25 people. The experimental group did fitness aerobics during physical education, and the control group followed a traditional program based on general physical training. To determine the effectiveness of physical education classes based on the design of fitness aerobics in comparison with the

**Table 2.** *Methodology of fitness aerobics training for female students in physical education at the university*

| Academic year period | General content of educational and practical classes | Means | Methods | Main goal |
|---|---|---|---|---|
| September - October | At this stage, the student development of general endurance through the use of fitness aerobics. Classes are held both indoors and outdoors (depending on weather conditions), recommended heart rate = 120-160 beats/min | Walking, running, hopping, jumping, jumping, lunges, climbs, descents, general developmental exercises, climbing, etc. | Uniform, alternating, circular | Development of general endurance, preparation of female students for the control exercise: 2000 m run |
| November -December | Development of speed and strength qualities through fitness aerobics. Classes are held in the gym, recommended heart rate = 120-160 beats/min | Walking, running, jumping, lunging, jumping jacks, weight training, etc. | Uniform, circular, interval, control | Development of speed and strength qualities of the legs and abdominals for effective performance of control exercises: standing long jump, lifting the body in a minute |
| February - March | Development of strength and speed qualities through fitness aerobics. Classes are held in the gym. Recommended heart rate=120-180 beats/min | Walking, running, weight training, general developmental exercises, etc. | Uniform, circular, interval, control-competitive | Development of speed and strength qualities to meet control standards in the 100 m run and flexion and extension of the arms in a prone position |
| April - May | Maintaining and improving physical qualities through fitness aerobics: endurance, strength, speed and integral qualities. Recommended heart rate=120-180 beats/min | Walking, running, jumping, exercises with obstacles, general developmental exercises with weights, etc. | Uniform, circular, interval, control, competitive, separate, continuous, alternating | Comprehensive maintenance of basic physical qualities, preparation for passing control exercises on general physical fitness |

traditional form of physical education, physical fitness indicators were taken: 2000 m run; 100m run; flexion and extension of the arms while lying down; standing long jump; lifting the body from a lying position in one minute.

**Results of the study and discussion.** To activate female students in physical education classes, increase motivation, harmonious development of basic physical qualities, formation of the proper level of physical fitness and academic work, sets of physical exercises based on fitness aerobics were developed, which were differentially included in the content of physical education of girls in the annual cycle of the academic year.

The differentiation of sets of exercises from fitness aerobics in the annual training cycle was as follows: September-October - a set of exercises to develop general endurance; November-December – fitness aerobics for the development of speed and strength qualities in girls; February-March – development of strength and speed qualities; April-May – combined sets of exercises to maintain and improve all basic physical qualities in girls, preparation and passing control tests on physical fitness. In general, the average increase in physical fitness indicators in the experimental group was 17.6% ($P<0.05$), in the control group – 6.8% ($P>0.05$).

In more detail and in dynamics, the increase in physical fitness indicators of female students of the experimental and control groups in the annual cycle is presented in Table 1.

Analysis of the results of the experiment on the design of fitness aerobics in the physical education of female university students showed the significant effectiveness of this implementation, where in all indicators of physical fitness the experimental group outperformed the control group by an average of 17.6% ($P<0.05$).

**Conclusions.** Designing sets of exercises from fitness aerobics into the program content of physical education for female students contributes to a significant increase in all indicators of girls' physical fitness, increasing physical performance, activity and motivation. The introduction of fitness aerobics into the physical education of female students contributed to an increase in physical fitness in the experimental group by an average of 17.6% ($P<0.05$) compared to the control group.

The results of the experiment allow us to recommend the design of sets of exercises from fitness aerobics into the practice of physical education of female students as an effective means of increasing the physical fitness of female university students.

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# Individual-typological and socio-psychological features of university students with different levels of readiness to participate in sports competitions

UDC 796.011: 159.9.072

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**Abstract**

**Objective of the study** was to study the individual typological and socio-psychological characteristics of university students with different levels of subjective readiness to participate in sports competitions.

**Methods and structure of the study**. 356 students (142 boys, 214 girls) of 1st–3rd year students of Nizhnevartovsk State University took part in the scientific work. All participants provided consent to conduct diagnostics and process personal data.

**Results and conclusions.** An individual's subjective readiness to participate in competitions is correlated with indicators of extraversion and introversion. Students with a dominant choleric type of temperament show greater readiness to participate in sports competitions, while those with a melancholic type show the least readiness. Among students with predominant sanguine and phlegmatic types of temperament, such tendencies were not identified. Constructive behavioral strategies for interpersonal interaction (cooperation and compromise) are noted among individuals with an average and above average level of readiness to engage in rivalry in competitive conditions. Students who are ready to take part in competitions demonstrate the best results in testing strength endurance, which requires the manifestation of volitional efforts. The results obtained indicate the need to search for and scientifically substantiate new competitive practices that satisfy the individual characteristics of university students, and their implementation in educational and extracurricular forms of physical education.

***Keywords:*** *readiness, temperament, individual characteristics, strategy of behavior in interpersonal interaction, model of organizing competition, physical education.*

**Introduction.** The insufficient participation of student youth in mass physical culture and sports events makes it urgent to conduct additional research to study the factors that influence the indicator of readiness of boys and girls to realize their own capabilities in competition conditions [2, 4]. From the position of the personal approach, readiness, as a fundamental basis of activity, reflecting the presence of training, certain abilities, as a conscious attitude to the upcoming work, is determined by individual characteristics [1, 6]. In the scientific literature, the determinants of objective and subjective readiness of athletes to participate in sports competitions were considered by G.D. Babushkin, V.N. Smolentseva et al. [5]. Identification of the individual characteristics of university students who, in the process of physical culture and sports activities, solve the problems of promoting health and improving their physique, rather than achieving sports excellence, will make it possible to competently select the appropriate competitive forms of a group or individual orientation, helping to achieve high rates of involvement in mass physical culture and sports events involving element of competition.

**Objective of the study** was to study the individual typological and socio-psychological characteristics of university students with different levels of subjective readiness to participate in sports competitions.

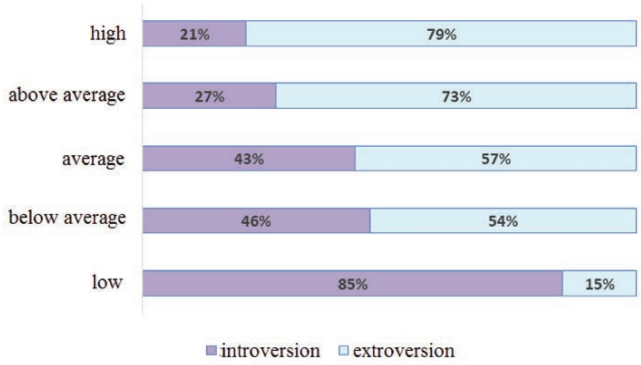
**Methods and structure of the study.** The following methods were used: questionnaire by K. Thomas - R. Kilmann "Strategy of Behavior in a Conflict Situation" (K. Thomas, 1974); questionnaire "Attitude towards competitive physical culture and sports activities" [3]; test questionnaire "The need to achieve a goal. Scale for assessing the need to achieve success" (Yu.M. Orlov, 1978); G. Eysenck's personality questionnaire for the study of individual psychological personality traits

(G. Eysenck, 1963). Standard tests were used to assess physical fitness. Mathematical processing of the results was carried out by calculating the arithmetic mean and its error, the reliability of differences using the Student's t-test between independent samples, and using the approximation method.

The study involved 356 students (142 boys, 214 girls) of 1–3 years of Nizhnevartovsk State University. All participants provided consent to conduct diagnostics and process personal data. The level of subjective readiness to participate in sports competitions was determined according to the results of the questionnaire "Attitude towards competitive physical culture and sports activities", namely, according to the quantitative indicator of the activity component, characterizing the degree of readiness to become a participant in a sports competition and get involved in competition: 0-3 points - low, 4-7 points – below average, 8-11 – average, 12-15 – above average, 16-18 points – high.

**Results of the study and discussion.** A study of the level of subjective readiness to participate in sports competitions of study participants showed a high level in 8%, above average in 22%, average in 34%, below average in 27%, low in 9% of boys and girls. 100% of students with a high level of subjective readiness to participate in competitions have a history of sports experience, 84% of boys and girls whose level corresponds to above average, 73% to average, 44% to below average and 12% to low. The results allow us to state a greater degree of readiness to become participants in competitive events among those students who have experience in organized sports under the guidance of a coach.

The features of the nervous system that appear during the study of temperament are the most stable individual-typological characteristics of a person, which cannot be significantly changed in the process of preparing for activity, but they must be taken into account. The study of individual typological characteristics of students showed that an individual's subjective readiness to participate in competitions correlates with indicators of extraversion / introversion (see figure). A greater number of extroverts is observed in the group of students with a high and above average level of readiness to get involved in sports competition (79% and 73%, respectively); the smallest number is observed in students with a low level (15%).




*The ratio of extroverts/introverts with different levels of subjective readiness to participate in competitions (in%)*

Table 1 shows that as the level of expression of readiness to participate in sports competitions increases, a larger number of students with a dominant choleric type of temperament are found (from 3.7% to 47.4%) and a decrease in the number of subjects with a dominant melancholic type of temperament (from 66.7% to 0%). Among students with predominant sanguine and phlegmatic types of temperament, such tendencies were not identified.

Knowledge of the prevailing strategies of student behavior in interaction allows us to select the most optimal models for organizing competition - individual or team, competition with oneself or with others. The dominant behavioral strategies in interpersonal interaction among students with different levels of subjective readiness to participate in competitions are presented in Table. 2.

Constructive behavior strategies are observed in individuals with an average and above average level of readiness, as well as in young men with a high level. Among students with a low level of readiness to engage in competition under competitive conditions, a "passive-adaptive" type of behavior in interpersonal interaction predominates, characterized by inertia in one's own actions and the intention to make concessions to the opponent in order to prevent confrontation. The girls who were ready to become competition participants demonstrated the absence of the predominance of any behavioral strategy in interpersonal interaction. At the same time, among students there is a relationship between the quantitative indicators of "competition" and "avoidance" and the level of readiness for practical activities related to participation in sports events.

The study of the need to achieve success showed the absence of group average differences among stu-

**Table 1.** *Correlation of types of temperaments among students with different levels of subjective readiness to participate in competitions (%)*

| Readiness level | Types of temperaments | | | |
|---|---|---|---|---|
| | Choleric | Sanguine | Phlegmatic | Melancholic |
| Low | 3,7 | 11,1 | 18,5 | 66,7 |
| Below the average | 14,3 | 21,4 | 25,0 | 39,3 |
| Average | 23,5 | 20,0 | 35,3 | 21,2 |
| Above average | 36,7 | 24,5 | 30,6 | 8,2 |
| High | 47,4 | 26,3 | 26,3 | 0 |

**Table 2.** *Strategies of behavior in interpersonal interaction of students with different levels of subjective readiness to participate in competitions (M±m)*

| Behavior strategy | Readiness level | | | | |
|---|---|---|---|---|---|
| | High | Above average | Average | Below the average | Low |
| Boys | | | | | |
| | (n=14) | (n=26) | (n=50) | (n=42) | (n=10) |
| Competition/rivalry | 5,8±0,4 | 4,3±0,5 | 4,2±0,3 | 2,8±0,4 | 2,1±0,7 |
| | $P_{1-2,1-3,1-4,1-5,2-4,2-5,3-4,3-5} < 0,05$; $P_{2-3,4-5}$ – no | | | | |
| Cooperation | 6,8±0,4 | 6,9±0,4 | 6,3±0,2 | 6,3±0,2 | 5,9±0,4 |
| | $P_{1-2,1-3,1-4,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |
| Compromise | 7,8±0,5 | 7,6±0,3 | 7,5±0,3 | 7,6±0,3 | 6,7±0,4 |
| | $P_{1-2,1-3,1-4,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |
| Avoidance | 4,1±0,2 | 5,6±0,3 | 5,9±0,3 | 7,3±0,3 | 9,2±1,1 |
| | $P_{1-2,1-3,1-4,1-5,\ 2-4,2-5,3-4,3-5,4-5} < 0,05$; $P_{2-3}$ – no | | | | |
| Device | 6,1±0,7 | 5,9±0,3 | 6,0±0,3 | 5,9±0,3 | 7,4±0,8 |
| | $P_{1-2,1-3,1-4,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |
| Girls | | | | | |
| | (n=13) | (n=53) | (n=70) | (n=54) | (n=24) |
| Competition/rivalry | 6,3±0,7 | 4,3±0,3 | 3,7±0,3 | 3,5±0,4 | 2,7±0,4 |
| | $P_{1-2,1-3,1-4,1-5,2-5,3-5} < 0,05$; $P_{2-3,2-4,3-4,4-5}$ – no | | | | |
| Cooperation | 5,7±0,5 | 6,5±0,3 | 6,6±0,2 | 7,0±0,3 | 6,5±0,4 |
| | $P_{1-4} < 0,05$; $P_{1-2,1-3,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |
| Compromise | 7,6±0,5 | 7,8±0,3 | 7,9±0,3 | 7,9±0,3 | 7,3±0,4 |
| | $P_{1-2,1-3,1-4,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |
| Avoidance | 4,8±0,4 | 5,8±0,2 | 6,2±0,3 | 6,2±0,3 | 8,5±0,5 |
| | $P_{1-2,1-3,1-4,1-5,2-5,3-5,4-5} < 0,05$; $P_{2-3,2-4,3-4}$ – no | | | | |
| Device | 6,2±0,5 | 6,1±0,3 | 6,3±0,3 | 6,2±0,3 | 5,7±0,6 |
| | $P_{1-2,1-3,1-4,1-5,2-3,2-4,2-5,3-4,3-5,4-5}$ – no | | | | |

dents with different levels of subjective readiness to participate in sports competitions.

Testing of motor abilities revealed a linear relationship between the results of tests requiring the manifestation of volitional efforts (strength endurance) and the level of subjective readiness to participate in sports competitions in both boys and girls. Using the approximation method, determination coefficients were obtained, stating a satisfactory relationship between the level of readiness and the results of the tests "Bending-extension of arms in a lying position" and "Raising the body from a lying position in 1 minute" (respectively R2 = 0.93 and R2 = 0, 92 for girls and R2=0.95 and R2=0.80 for boys). Students who are ready to take part in competitions demonstrate the mobilization of mental and physical capabilities in achieving the best results in their activities. In the test tests "Standing long jump", "Jumping rope in 1 minute", "Bending forward from a position sitting on the floor", "Shuttle run 3x10 m" no such dependence was found.

**Conclusions.** The study showed that university students with experience in sports, extroverts with a dominant choleric type of temperament, demonstrating a behavior strategy focused on reciprocity, demonstrate their readiness to take part in a sports competition. They also have higher results in motor tests that require the manifestation of volitional efforts.

Students with a low level of readiness to participate in traditional forms of competitive sports competitions are distinguished by a pronounced melancholic type of temperament and a passive-adaptive type of behavior in interpersonal interaction.

The results obtained state the need to search and scientifically substantiate new competitive practices with various models of organizing competition that satisfy the individual characteristics of university students, and their implementation in educational and extracurricular forms of physical education.

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# Training of employees of police security and escort units in the application of self-defense and detention techniques in typical situations of office activities

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***Key words:*** *police, police security guards, physical training, self-defense and detention techniques, situational method.*

**Introduction.** Employees of security and escort police units must be able to apply self-defense and detention techniques in various situations of their professional activities [1]. However, as part of the initial physical training of police officers, self-defense and arrest techniques are usually considered outside the context of their future official activities [2]. To develop the professional readiness of employees of security and escort police units to use self-defense and detention techniques, it is necessary to develop and use in the training process typical situations of protection from attacks on employees.

**Purpose of the research** – identifying the effectiveness of using a situational method of training police officers escorting criminals in the use of self-defense and detention techniques.

**Research methodology and organization.** The study was conducted in 2023 on the basis of the Tyumen Institute for Advanced Training of Ministry of Internal Affairs employees. The study used scientific methods: analysis and generalization of training methods, modeling of typical situations of the use of physical force by police officers escorting criminals; pedagogical experiment, testing. The developed set of situations involving the use of self-defense and detention techniques by police officers escorting criminals was used in the experimental group as part of mastering the discipline "Physical Training" of the professional (initial) training program. At the end of the training period, employees from the EG and CG were tested on their skills in using self-defense and arrest techniques in typical situations.

**Results and its discussion.** As a result of the study, a set of situations was developed for the use of self-defense and detention techniques by police officers escorting criminals. The complex included situations: actions during an attack in the corridor of a cell block of a temporary detention facility; protection from a group attack in a cell in a temporary detention facility; forced removal of a citizen from an A3 type operational service vehicle. At the end of the training period, it was revealed that among representatives of the experimental group, the level of readiness for the situational use of self-defense and arrest techniques increased by 16.4% more in the experimental group.

**Conclusion.** The results of the study revealed the effectiveness of using the situational method and typical situations of using self-defense and detention techniques for training by police officers escorting criminals. One of the priority areas for the development of the situational use of physical force is the search for effective ways of interaction between employees in order to physically suppress the commission of an act of self-harm by a suspect or accused in a protective fence in the courtroom.

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# Ensuring physical activity of the population by involving citizens in sports tourism events

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**Abstract**

**Objective of the study** was to assess the opportunities for sports tourism provided by tourism operators in Yekaterinburg for various categories of citizens, as well as the preferences of specific age groups.

**Methods and structure of the study.** The activities of 14 travel companies registered in Yekaterinburg and positioning themselves as domestic tourism operators providing services of one- and multi-day active tours designed for categories of citizens with different levels of physical fitness are considered.

**Results and conclusions.** It is shown that currently tourism operators in Yekaterinburg offer a wide range of active tourism services designed for the population of all age categories and various levels of physical fitness. These events are in fairly high demand among the population of the region, giving citizens the opportunity, if they have the appropriate motivation, to provide themselves with the necessary level of physical activity in the form of weekend tours. It is shown that the preferences of different age categories in the field of active tourism of the population differ significantly, which must be taken into account by operators creating tour programs. At the same time, in terms of gender, the main consumers of tourism services are females; the predominance of any specific age groups of the population has not been identified. A high level of satisfaction with the provided tourist services is demonstrated equally by all age categories of the population: 56.7% of people of retirement age and 58.3% of hikers under the age of 35, which indicates the good organization of tourism activities in the region.

***Keywords:*** *sports tourism, travel companies, physical activity.*

**Introduction.** Currently, the problem of preserving and maintaining an acceptable level of physical activity, which is one of the components of a healthy lifestyle, is becoming relevant for all categories of the population [1, 3, 4]. It should be recognized that modern Russian megacities, despite the many factors that have a negative impact on the general health of the population, provide a wide range of opportunities for physical education and sports, which can be used, if desired, by almost all categories of citizens - from young people to the elderly age.

One of the forms of physical activity, successfully implemented and promoted at the level of the Sverdlovsk region and the Ural Federal District as a whole, is sports tourism, carried out mainly in the form of so-called "weekend tours", ensuring the achievement of several goals at once: familiarizing the population with natural sights of the region, fostering environmentally responsible behavior and maintaining the required level of physical activity of city residents. Contrary to popular belief, tours of this type are in demand among people belonging to different age groups, although the priorities of specific sports may differ.

**Objective of the study** was to assess the opportunities for sports tourism provided by tourism operators in Yekaterinburg for various categories of citizens, as well as the preferences of specific age groups.

**Methods and structure of the study.** The study examined the activities of 14 travel companies registered in Yekaterinburg and positioning themselves as domestic tourism operators, providing services of one- and multi-day active tours, designed for categories of citizens with different levels of physical fitness. The total volume of tourist flow, the age of the event participants, as well as the latter's opinions about the level of services provided were assessed based on exchanges of opinions on the social networks VKontakte and Telegram and personal conversations with participants in tourist trips.

In Figure 1 shows the percentage of various categories of consumers that form the basis of the tourist flow of companies founded in different periods of time. As follows from the data presented, tourism operators with a longer history of existence give priority to consumers belonging to the older age group (the maximum age of participants is 85 years), which may be due to the desire to maintain the established contingent of participants, adapting to their needs. At the same time, the youngest travel companies, whose managers are characterized by a dynamic attitude to the formation of route programs, naturally try to attract the population belonging to the middle and younger age groups (the maximum age of participants in this case was 60 years, the average - 38.3 years) . Thus, it can be noted that almost all categories of the population are covered by active tourism services, and the latter can choose the company that is most suitable in terms of age composition.

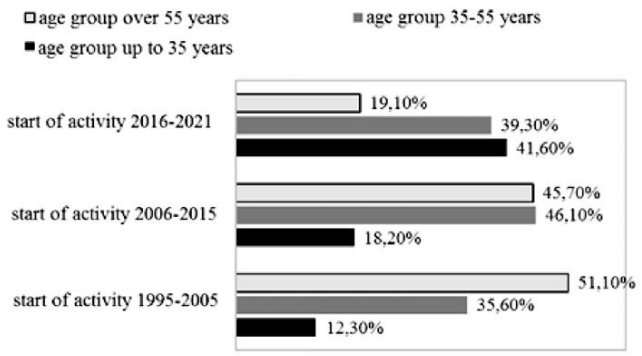


*Figure 1. Age composition for this period of time (2023) of consumers of tourism services. The y-axis is the beginning of the activity of the travel company. The x-axis is % of the total number of participants*

**Results of the study and discussion.** The analysis of the activities of travel companies shows that the categories of tour operators mentioned above differed significantly in the range and ratio of active tourism services offered. Figure 2 shows the most common types of active tours and their percentage in the total list of activities in the spring-summer period (May-September 2023). As you can see, enterprises aimed at working primarily with the population of older age groups give preference to quieter routes - excursion trips to the forest and one-day rafting of the first category of difficulty along the Ural rivers, which does not require extreme physical effort from the participants, but at the same time provides tourists with the necessary level of physical activity and communication with like-minded people. In general, events of this type make up less than 50% of all offered excursion routes, but are in constant demand among consumers of tourism services: the average number of participants in an excursion group is 35-45 people (maximum - 70 people), the most popular type of program is catamaran rafting and rafts is the only event among the participants of which all age groups of the population are represented in almost equal proportions.

Relatively recently operating travel companies, as shown in Figure 2, give priority to active tours, which make up about 75% of the total list of services provided. Among the latter, mountain routes of a higher level of difficulty predominate, including those with the possibility of overnight stays in a tent camp, one-day (on Sup-boards) and multi-day rafting with elements of extreme loads. It is obvious that events of this kind are designed primarily for people with a good level of physical fitness, good health and a relatively young age (the limit is 60 years, but often lower). It should be noted that all officially registered operators and tourist clubs strive to comply with the requirements for ensuring the safety of tourists to the maximum extent possible, by engaging trained instructors, renting the necessary equipment and equipment, etc.

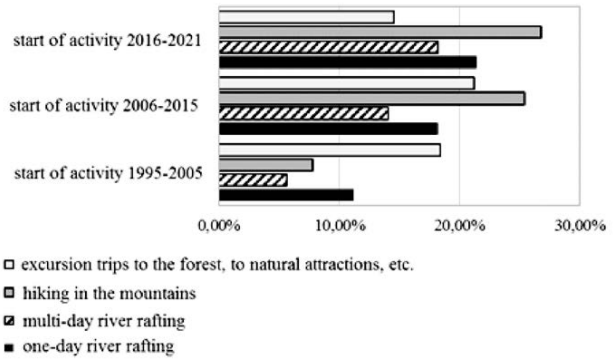


*Figure 2. Sports tourism services offered by travel companies in Yekaterinburg. The x-axis is % of the total range of tourism services*

Thus, it can be stated that the population of Yekaterinburg and neighboring cities has the opportunity to realize their needs for additional physical activity by participating in a variety of sports tours, the routes of which are offered by tour operators for all categories of the population with different levels of training. Currently, 72 weekend tour programs are being implemented in the region, 2/3 of which relate to sports tourism routes of varying levels of difficulty.

In terms of gender, the ratio of consumers of tourism services remains at the level of 3:1 (women: men), regardless of the age category and level of difficulty of the route, the number of participants in the group varies from 10-15 (hiking in the mountains) to 50-70 (one-day rafting Ural rivers).

The study did not confirm the data on the leading role of collective behavior influencing the motivation of people of retirement age to engage in physical education and health activities: the number of single participants in hiking trips averages 16% (for younger people the figures are similar) [1, 2, 5] .

Of all participants in tourist trips, 62.3% learned about the routes and activities of travel agencies from their acquaintances, colleagues, friends, relatives, etc., 12.4% - from advertising mailings and 25.3% looked for specific information on their own, which allows us to conclude that the rather low effectiveness of advertising campaigns and the high importance of personal communications up to the present day.

A high level of satisfaction with the results obtained is demonstrated by 56.7% of people of retirement age and 58.3% of hikers under the age of 35, extremely low - 5.1% and 3.9%, respectively, which demonstrates the generally good organization of tourism activities in the region.

**Conclusions.** The conducted research allows us to conclude that travel companies in Yekaterinburg offer a fairly diverse range of sports tours, the levels of which are adapted to different age categories of the population, which allows, if there is internal motivation, to satisfy the needs of citizens for additional physical activity, combined with environmental education and upbringing of the population.

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# Assessment of motor activity of mature age women in the republic of Sakha (Yakutia)

UDC 304.3

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**Abstract**

**Objective of the study** was to assess the physical activity of mature women living in urban and rural areas of the Republic of Sakha (Yakutia).

**Methods and structure of the study.** An international questionnaire for assessing physical activity (International Questionnaire on Physical Activity - IPAQ), developed by international WHO experts, was used, taking into account the types of physical activity performed by a person during the last week. Currently, the IPAQ, as well as its improved version (GPAQ), as an internationally comparable indicator for assessing the level of physical activity of the population, is used in more than 130 countries around the world [12, 13].

The survey was conducted using Google Forms (https://forms.gle/wm84Lcvn6A7qmUbU8) with the participation of 736 women living in the central regions of Yakutia.

Results and conclusions. Based on the results of the study, a deficit in physical activity was identified among women living in urban and rural areas of the Republic of Sakha (Yakutia):

– 71.4% of women aged 18-39 years and 29.7% of women aged 40 to 65 years living in urban areas;

– in 67.9% of women aged 18-39 years, in 35.2% aged 40-65 years, and also in 25% of women over 65 years old living in rural areas.

**Keywords:** *assessment of physical activity, physical inactivity, mature women, Republic of Sakha (Yakutia).*

**Introduction.** A person is in a potentially dangerous physical and social environment, to which he is forced to continuously adapt (adapt). In this case, physical activity acts both as a means and as a result of adaptation [1].

Optimal physical activity can be defined as an area of "stable states located between the minimum and maximum levels of physical activity and providing a training effect," and the training effect should be noticeable, allowing for an increase in physical performance, and have a healing effect for the human body [9].

In optimal volumes, regular physical activity makes it possible to increase the efficiency of the cardiorespiratory system, improves the adaptive potential of a person, which leads to more effective resistance of the body to adverse environmental factors. Based on this, it can be argued that physical activity is an effective non-drug factor in the health of the population, increasing the general and nonspecific immune status, enhancing adaptation processes in the human body [5, 6].

Requirements for the structure and intensity of physical activity should contribute to the formation in the body of such a number and such adaptive functional systems that would ensure the necessary level of vital activity and health indicators in the expected conditions. The basis for constructing a

model of motor activity should be the requirements objectively imposed on a person, both by the nature and conditions of his habitat, and by the requirements for psychophysiological readiness for future life activity [2].

The study of the characteristics of motor activity of citizens of working age made it possible to establish that a person in everyday life uses approximately 25% of his absolute capabilities [10, 8].

Each region of Russia has natural and climatic features that influence physical activity, physical development, and public health. According to promising estimates in the 21st century. Climate change will impact human health with a very high degree of certainty, mainly exacerbating existing problems [3, 14].

The specificity of physical activity of the population of the Far East is "due to a deficit of natural physical activity" as a consequence of special natural and climatic conditions, and the modern system of physical education is not effective enough to minimize the negative impact of the living environment [11].

**Objective of the study** was to assess the physical activity of mature women living in urban and rural areas of the Republic of Sakha (Yakutia).

**Methods and structure of the study.** An international questionnaire for assessing physical activity (International Questionnaire on Physical Activity - IPAQ), developed by international WHO experts, was used, taking into account the types of physical activity performed by a person during the last week. Currently, the IPAQ, as well as its improved version (GPAQ) as an internationally comparable indicator for assessing the level of physical activity of the population, is used in more than 130 countries around the world [12, 13].

The survey was conducted using Google Forms (https://forms.gle/wm84Lcvn6A7qmUbU8) with the participation of 736 women living in the central regions of Yakutia

**Results of the study and discussion.** According to the survey results, only 7.6% of women devote time to daily organized physical activity; 3.4% engage in physical exercise six days a week; A little more than 5% devote time to physical activity four to five times a week; 20.9% of women say they exercise three times a week; 15.4% train twice a week; 41.3% engage in physical education and sports activity no more than once a week.

It was found that the duration of intense physical activity: for 32.2% of respondents lasts less than 10 minutes; 10-20 minutes in 19.5%; 17.3% of women move intensively for 20-40 minutes; 12.9% perform intense physical activity for 40-60 minutes; 17.9% of women surveyed claim that such a load lasts 1 hour or more.

The study revealed that 15% of women do daily low-intensity physical activity, 4-9% do this for four to six days, 13-15% of respondents do this on average two to three times a week, the rest do it less.

31.1% of respondents do daily walking, 11-16% do it five to six days a week, about 6% of respondents have the opportunity to engage in this type of activity four days a week, 6-9% manage to walk two to three days a week. , and 18.2% of survey participants indicated that they manage to walk only once a week. At the same time, the duration of walking for 39.2% takes less than 20 minutes, about 30% spend 20 to 40 minutes walking, 6.7% of women walk for 1-1.5 hours, and walk for more than 1.5 hours 9.6% of respondents.

The survey made it possible to determine the length of time women spend in a sitting position. We found out that during the day 6.1% sit for less than 1 hour, 8.1% sit in a sitting position for 1-3 hours, 11.1% sit for 3-4 hours, 12.3% sit in a sitting position for 4-5 hours. for 5-6 hours - more than 12%, 6-7 hours - more than 9% of respondents, more than 12% of women spend 7-8 hours in a sitting position and, according to 27.3% of respondents, they are forced to be in this position for more than 8 hours (Fig. 1, 2).

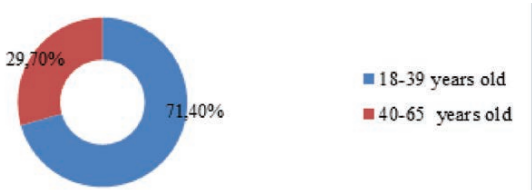


*Figure 1. Deficit of physical activity in women living in rural areas*

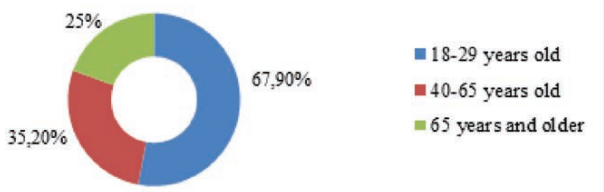


*Figure 2. Deficit of physical activity in women living in urban areas*

**Conclusions.** An analysis of the degree of physical activity of women living in urban and rural areas of the Republic of Sakha (Yakutia) revealed a deficit of physical activity:

- 71.4% of women in the age range of 18-39 years and 29.7% of women aged 40 to 65 years living in urban areas;

- 67.9% aged 18-39 years, 35.2% aged 40-65 years, as well as 25% of women over 65 years old living in rural areas.

Based on the information obtained, it can be argued that mature women living in urban areas experience deficits in physical activity to a greater extent compared to rural women; more pronounced values are observed in the age range of 18-39 years.

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# Sociological analysis of the attitude to physical education of urban and rural schoolchildren in China

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**Abstract**

**Objective of the study** was to conduct a sociological analysis of the attitude to the physical culture of urban and rural schoolchildren in China, identify patterns and trends and adopt positive pedagogical directions and design them into the domestic practice of physical education of schoolchildren.

**Methods and structure of the study.** To conduct a sociological analysis of the attitude of Chinese schoolchildren to physical education, a questionnaire was developed. The survey was attended by urban and rural schoolchildren of the 7th-9th grades of the People's Republic of China. The total number of schoolchildren was 700 people (300 rural and 400 urban schoolchildren). Within the framework of mutual cooperation, graduate students studying at the Krasnoyarsk State Pedagogical University named after V.P. Astafiev conducted a survey of schoolchildren in China. Accordingly, the collected sociological material was processed and presented in the table. These results allow us to see a sociological picture of the attitude to the physical culture of urban and rural schoolchildren in China.

**Results and conclusions.** A questionnaire of sociological analysis of attitudes towards the physical culture of urban and rural schoolchildren in China included nine main questions:

1. What should be the teacher?
2. Do you like creative teachers?
3. What should be the main thing in the lesson of physical culture?
4. Are your teachers strict?
5. What does physical education teach you?
6. Is it difficult for you to study in physical education lessons?
7. What is not etched for you in physical education lessons? Et al.

As the analysis of the survey results showed, the attitude of Chinese schoolchildren to physical education: more than 55% of Chinese schoolchildren love teachers with humor, who constantly contribute something new and interesting in their lessons; 80% of schoolchildren believe that the class needs to be differentiated by the level of physical fitness and 32% of children see the division of the class into girls and boys; 65% of schoolchildren in China do not like physical education, as they are very tired of physical activity.

The sociological analysis made it possible to identify the strengths and weaknesses of teaching physical culture in Chinese schools and make appropriate adjustments to the practice of domestic physical culture in the country's schools.

***Keywords:*** *physical education, sociological analysis, urban and rural schoolchildren, China.*

**Introduction.** Currently, the People's Republic of China continues to amaze the world community with its progressive achievements in the socio-economic development of the country, including in physical culture and sports. Physical education is a compulsory academic discipline for children in schools in China. A sociological analysis of the attitude of urban and rural schoolchildren in China to physical education was carried out. This analysis will allow us to see the positive and negative aspects of the functioning of physical

**Table 1.** *Results of a sociological survey of the attitude of schoolchildren in grades 7-9 in China to physical education at school*

| No. | Survey question | Schoolchildren's answers | |
|---|---|---|---|
| | | Urban | Rural |
| 1 | What kind of teacher should a teacher be? | 55% - with a sense of humor<br>39% - ability to perform physical exercises well | 40% - with a sense of humor<br>60% - ability to perform physical exercises well |
| 2 | Do you like a teacher who allows students to offer something new? | 50% - like it<br>50% - don't like it | 56 % - like it<br>44 % - don't like it |
| 3 | What should be the main content of a physical education lesson? | 75% - training in sports<br>18% - free content | 58 % - training in sports<br>42 % - free content |
| 4 | How should students be distributed in the classroom during physical education classes? | 32% - girls and boys separately<br>68% - by level of physical fitness | 16 % - girls and boys separately<br>84 % - by level of physical fitness |
| 5 | Do physical education teachers punish you? | 60% - no<br>40% - yes | 80 % - no<br>20 % - yes |
| 6 | What do you want from physical education? | 60% - vigor and health<br>35% - development of sports skills<br>5% - there is no way to avoid physical education | 60 % - vigor and health<br>30 % - development of sports skills<br>10 % - there is no way to avoid physical education |
| 7 | If you have a hard time in physical education classes, will you give them up? | 90 % - no<br>10 % - yes | 94 % - no<br>6 % - yes |
| 8 | Why do you like physical education class? | 20% - you can play with classmates<br>30% - the teacher conducts the lesson well<br>18% - distract from other subjects<br>32% - good for health | 20% - you can play with classmates<br>10% - the teacher conducts classes in an interesting way<br>20% - I feel freedom only in physical education<br>50% - good for health |
| 9 | For what reason do you not like physical education? | 60% - I get very tired<br>20% - is a waste of time<br>10% - not interesting<br>10% - don't like the way the teacher leads | 65 % - I get very tired<br>15 % - is a waste of time<br>15 % - not interesting<br>5 % - don't like the way the teacher leads |

education in Chinese schools and make the necessary adjustments to the domestic process of physical education.

**Objective of the study** was to conduct a sociological analysis of the attitude towards physical education of urban and rural schoolchildren in China, to identify patterns and trends, to adopt positive pedagogical directions and project them into the domestic practice of physical education of schoolchildren.

**Methods and structure of the study.** To conduct a sociological analysis of the attitude of Chinese schoolchildren to physical education, a questionnaire was developed. Urban and rural schoolchildren in grades 7-9 of the People's Republic of China participated in the survey. The total number of schoolchildren was 700 people (300 rural and 400 urban schoolchildren). As part of mutual cooperation, graduate students studying at the Krasnoyarsk State Pedagogical University named after V.P. Astafiev, conducted a survey of Chinese schoolchildren. Accordingly, the collected sociological material was processed and presented in the table. These results allow us to see a sociological picture of the attitude towards physical education of urban and rural schoolchildren in China.

**Results of the study and discussion.** Upon completion of a sociological survey based on a developed

questionnaire, which included nine main questions, the general attitude of Chinese schoolchildren towards physical education at school was revealed.

Table 1 presents in detail the survey questions and the results of the responses of urban and rural schoolchildren in grades 7-9 in China on their attitudes towards physical education classes at school.

Analysis of Table 1 showed the following: more than 60% of schoolchildren have a positive attitude towards teachers who conduct physical education lessons in a creative and interesting way; more than 70% of schoolchildren believe that it is necessary to study more various sports in physical education lessons; more than half of schoolchildren want to gain vigor and health from physical education lessons; up to 70% of schoolchildren get very tired from the stress of physical education lessons; up to 20% of schoolchildren have the opportunity to play with classmates during physical education lessons. In general, up to 70% of urban and rural schoolchildren perceive physical education classes at school positively.

**Conclusions.** A sociological analysis of the attitude of urban and rural schoolchildren in China to physical education showed the following results: 55% of urban schoolchildren believe that a physical education teacher should have a sense of humor; 60% of rural schoolchildren say that the teacher must demonstrate the exercises well; 50% of urban and rural schoolchildren like it when the teacher introduces something new into the lesson; up to 70% of urban and rural schoolchildren believe that more time should be spent learning new sports in physical education lessons; 60% of urban and rural schoolchildren want to gain vigor and health during physical education lessons. This phenomenon is observed among schoolchildren in China - more than 60% of children get very tired during physical education lessons.

The obtained analytical material allows us to compare it with the practice of physical education classes of Russian schoolchildren and make the necessary adjustments to the program content of domestic school physical education.

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# The effects of TRX exercises on the stabilizer muscles of women involved in recreational fitness

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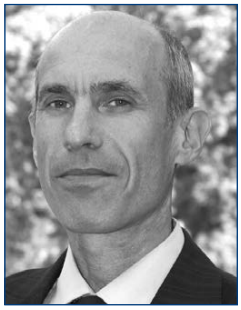

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**Abstract**

**Objective of the study** was to determine the degree of force impact of various TRX exercises on the stabilizer muscles of women involved in health fitness.

**Methods and structure of the study.** The experiment was conducted at the "Gravitation" fitness club, St. Petersburg. The study involved six women aged 38-45 years with different ratios of stabilizing muscle strength. Electrical activity was recorded in eight stabilizer muscles of the trunk and lower extremities while performing 17 common TRX exercises. Muscle electrical activity was recorded using the Delsys Trigno™ wireless system (Delsys Inc.). Using electromyography data, the strength developed by the muscles was indirectly assessed and TRX exercises were determined that had the greatest impact on individual stabilizer muscles.

**Results and conclusions.** Different directions and degrees of impact of TRX exercises on stabilizer muscles have been established. Complex impact exercises include "Diagonal twisting" and "Pica", during which the relative electrical activity, characterizing the force developed, for the rectus and external oblique abdominal muscles, rectus femoris, trapezius and iliopsoas muscles ranges from 68.4% to 94.1%. The exercises that have the greatest selective impact include: for the rectus abdominis muscle – "Saw", for the external oblique abdominal muscle – "Pike", for the rectus femoris muscle – "Twisting", for the biceps femoris muscle – "Plank on the back", for the middle for the gluteal muscle – "Leg extension in a supine plank", for the trapezius muscle – "Reverse plank", for the iliopsoas muscle – "Pike", for the quadratus lumborum muscle – "Side plank". When performing these exercises, the relative electrical activity of the muscles is more than 80%. The obtained patterns must be taken into account when developing methods for correcting the physical fitness of women involved in health-improving fitness using TRX exercises.

***Keywords:*** *fitness, TRX exercises, stabilizer muscles, electromyography.*

**Introduction.** The need to maintain an optimal level of vital activity shapes the need of the adult population for health-improving fitness classes. Among the entire list of fitness areas, one can highlight TRX training (TRX Suspension Training), which has become popular not only in the field of fitness, but also in sports activities (athletics, rowing, cross-country skiing, etc.) [2, 3, 8]. A distinctive feature of TRX classes is the use of special simulators - hanging loops of adjustable length, with the help of which the exercises are performed. Varying the training load during TRX classes is carried out by changing the angle of the torso and the area of support. The main requirement for practitioners when performing TRX exercises is to maintain a "neutral" position of the torso from the head to the pelvis in the form of a straight line in various planes [9]. In this regard, TRX exercises influence the development of strength qualities of the stabilizer muscles (core muscles), the main function of which is to maintain a stable position of the pelvis, hips and spine [5].

An insufficient level of development of the strength of the stabilizer muscles provokes the appearance of destructive changes in the back area, which negatively affects the general condition of the human body [10]. This applies to all age groups involved in health fitness, including women of the 2nd period of adulthood, who make up a significant part of the contingent of fitness clubs.

Despite the attention of specialists to TRX training, it can be stated that at present the issue regarding the effect of TRX exercises on individual stabilizer muscles has not been sufficiently studied [1, 4]. As a rule, only a qualitative analysis of TRX exercises is performed from the perspective of functional anatomy. At the same time, it is necessary to obtain quantitative data on the degree of strength impact of TRX exercises on stabilizer muscles. In practice, it is not possible to directly determine the force developed by individual muscles, but indirectly assessing the differentiated strength effect of TRX exercises on stabilizer muscles becomes possible by analyzing their electrical activity.

**Objective of the study** was to determine the degree of forceful impact of various TRX exercises on the stabilizer muscles of women of the 2nd period of adulthood engaged in recreational fitness.

**Methods and structure of the study.** The experiment was carried out at the Gravitation fitness club, St. Petersburg. Six women aged 38-45 years with 4 to 8 years of fitness experience took part in the study. The women were selected on the basis of preliminary testing, which allowed them to identify different variations in the ratio of stabilizer muscle strength, typical for those involved in recreational fitness [7].

Electrical activity of eight stabilizer muscles of the trunk and lower extremities was recorded while performing 17 common TRX exercises. Muscle electrical activity was recorded using the Delsys Trigno™ wireless system (Delsys Inc.). Periods of muscle activity were identified on electromyograms and the RMS indicator was determined, which makes it possible to indirectly assess the efforts being developed [6]. In order to compare the effects of different TRX exercises, the relative electrical activity of the stabilizer muscles was calculated. To do this, for each muscle the percentage of RMS values to their maximum value was calculated when performing all exercises. For each exercise, four cycles of movements or holding a static position for 15 s were analyzed.

**Results of the study and discussion.** The table shows the average values for the subjects of the relative electrical activity of the stabilizer muscles when performing TRX exercises. The names of the exercises are given in accordance with the terminology adopted in TRX training [9]. As can be seen from the table, the relative electrical activity and, ac-

Relative electrical activity of stabilizer muscles during TRX exercises, %

| Exercise | Muscle | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | RA | OA | RF | BF | GM | TR | IL | QL |
| «Bend to the side» | 24,3 | 54,6 | 12,2 | 12,9 | 28,5 | 35,7 | 24,6 | **57,8** |
| «Diagonal Twist» | **77,3** | **89,6** | **76,4** | 14,0 | 23,7 | **77,0** | **79,3** | 43,7 |
| «Forearm Plank» | 52,7 | 53,2 | 42,6 | 9,3 | 12,5 | 21,8 | 39,4 | 25,0 |
| "Leg Raises in Forearm Plank" | 40,3 | 38,5 | **65,0** | 9,0 | **56,9** | 26,7 | 57,2 | 37,0 |
| «Saw» | **82,1** | 57,5 | 54,7 | 11,4 | 14,0 | 27,3 | 50,8 | 33,1 |
| «Pullover on the knees» | **70,7** | 48,2 | 6,8 | 11,0 | 14,7 | 14,6 | 25,7 | 21,0 |
| «Climber» | **74,5** | **69,5** | **76,9** | 13,4 | 25,3 | 33,7 | **73,0** | 42,9 |
| «Back plank» | 8,2 | 6,0 | 6,6 | **96,6** | **52,7** | 48,0 | 18,0 | **50,4** |
| "Leg spread in back plank" | 10,3 | 7,9 | 10,8 | 43,7 | **91,6** | **59,2** | **63,6** | **60,1** |
| «Side plank» | 56,8 | **62,9** | 51,3 | 13,1 | **52,0** | 54,9 | 49,8 | **98,0** |
| «Twisting» | 69,4 | **87,4** | **97,8** | 11,9 | 19,7 | 37,1 | **87,5** | 43,1 |
| «Reverse plank» | 13,2 | 7,6 | 9,7 | **81,5** | **48,3** | 49,8 | 23,4 | 48,7 |
| «Exit to reverse plank» | 27,1 | 25,5 | 8,3 | **72,0** | 44,1 | **79,4** | 31,1 | **64,6** |
| «Leg Curl Lying on Your Back» | 11,5 | 7,1 | 7,8 | **92,2** | 36,6 | 47,9 | 29,2 | 47,9 |
| «Glute Bridge» | 10,6 | 8,8 | 6,9 | **77,9** | 40,7 | **64,6** | 33,0 | 49,9 |
| «Pika» | **76,7** | **94,1** | **68,4** | 11,2 | 26,5 | **75,7** | **92,1** | 46,3 |
| «Palm Plank» | 69,2 | 45,2 | 47,3 | 9,2 | 12,0 | 32,0 | 47,8 | 24,2 |

*Note:* RA - rectus abdominis muscle, OA - external oblique muscle, RF - rectus femoris muscle, BF - biceps femoris muscle, GM - middle gluteus muscle, TR - trapezius muscle, IL - ilio–lumbar muscle, QL - square muscle of the lower back. The largest values of the electrical activity of each muscle are highlighted.

cordingly, the force effect of TRX exercises on the stabilizer muscles differ significantly. Some of them have a complex effect on several muscles of the stabilizers of the trunk and lower extremities at once. These include "Diagonal Twisting" and "Peak". Other exercises, such as "Bending to the side", "Saw", "Pullover on the knees" and "Bending the legs lying on the back", mainly affect only one muscle, and the exercises "Plank on the forearms" and "Plank on the palms" have relatively little effect on the efforts developed by all muscles.

We can distinguish exercises that have a pronounced selective effect on individual stabilizer muscles, during which muscle activity reaches 80 percent or more of the maximum. For the rectus abdominis muscle it is "Saw"; for the external oblique abdominal muscle – "Pike", "Diagonal twist" and "Twist"; for the rectus femoris muscle – "Twisting"; for the biceps femoris muscle – "Spine plank", "Supine leg curl" and "Reverse plank"; for the gluteus medius muscle – "Leg extensions in the plank on the back"; for the trapezius muscle – "Exit to the reverse plank"; for the iliopsoas muscle – "Pike" and "Twisting"; for the quadratus lumborum muscle – "Side plank".

It should be noted that without obtaining quantitative data, the degree of impact of certain TRX exercises on stabilizer muscles is not so obvious. In particular, when performing the "Side Plank" exercise, the quadratus lumborum muscle turned out to be maximally loaded, but at the same time, the external oblique abdominal muscle and the iliopsoas muscle did not show high enough activity, as might be expected. There is reason to believe that unstable support on suspension loops leads to an increase or redistribution of the load on individual muscles.

**Conclusions.** The degree of forceful impact of various TRX exercises on the stabilizer muscles of women in the 2nd period of adulthood varies significantly. TRX exercises are divided into complex exercises and exercises that have an increased impact on individual stabilizer muscles. The focus of TRX exercises must be taken into account when developing a method for correcting the physical fitness of those engaged in recreational fitness.

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# Outdoor games – an effective means of developing physical qualities of junior schoolchildren

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**Abstract**

**Objective of the study** was to evaluate the impact of outdoor games at school on the physical fitness indicators of 8-9 year old children.

**Methods and structure of the study.** The pedagogical experiment was carried out from September 12, 2022 to May 17, 2023 on the basis of school No. 12 in Kirov, 56 schoolchildren from the 2nd grade took part in it, who were differentiated into two groups: control (CG) and experimental (EG) 28 students each. In the EG, in contrast to the CG, along with traditional classes, outdoor games were used for 8-9 minutes in each physical education lesson.

**Results and conclusions.** As a result of the use of outdoor games in the EG, a significant increase in indicators was revealed for all tests: "Running 30 meters" - an improvement of 18.2% ($p<0.05$); "Pulling up from a lying position" – improvement by 40.2% ($p<0.05$); "Shuttle run 3x10 m" – improvement by 10.3% ($p<0.05$); "Forward bend" – improvement by 43.2% ($p<0.05$). The results of the pedagogical experiment showed that outdoor games are an effective means of increasing the physical activity of students in a general education organization.

***Keywords:*** *physical activity, physical inactivity, sensitive period, physical culture.*

**Introduction.** The problem of physical activity deficit has become more acute in recent years. Schoolchildren spend most of their time on gadgets, TVs, phones, and devote less and less time to physical education. One of the ways to solve the issue of physical inactivity is physical education and sports [2, 3]. At school, among the variety of means and methods of physical education, outdoor games are often used at primary school age, and sports games at the senior level. In the process of outdoor play, children comprehensively develop physical qualities. Games also contribute to the development of courage, determination, and the ability to work in a team [4, 5].

It should be noted that school age is favorable for the development of all physical qualities without exception; it is especially important to pay attention to the development of physical qualities from the first physical education classes at school when working with the junior level [6, 7].

Thus, there was a need to supplement the physical education lesson with outdoor games that would attract the attention of schoolchildren and have a positive impact on the development of physical qualities of schoolchildren.

**Objective of the study** was to evaluate the impact of outdoor games at school on the physical fitness indicators of 8-9 year old children.

**Methods and structure of the study.** The pedagogical experiment was carried out from September 12, 2022 to May 17, 2023 at school No. 12 in Kirov, 56 schoolchildren from the 2nd grade took part in it, who were differentiated into two groups. The control group (CG – children from class 2A, numbering 28 students) studied according to the usual physical education program at school [1]. In the experimental group (EG - children from grade 2B, 28 students), along with traditional sets of exercises, outdoor games were used for 8-9 minutes in each physical education lesson.

All physical education classes were held three times a week according to the school schedule, and each lesson lasted for 40 minutes. All children who participated in the study were healthy and were cleared by a doctor to attend physical education lessons at school. The control group more often used the repeated method, and the experimental group used the game method.

From a large arsenal of outdoor games, those that contributed to the fulfillment of the objectives of a particular physical education lesson were selected [2, 8, 9]. So, for example, the following games are better suited for developing speed: "Sentries and Scouts", "Empty Space", "Relay Race with Turns". For the primary development of dexterity: "The second one is the odd one out," "Exact turn," "If your legs became arms." You can influence flexibility and coordination with the help of games: "Crucian carp and pike", "Forbidden movement", "Tunnel of hoops". And to develop speed and strength abilities, you can use the game "Geese-Swans" or "Fox and Chickens".

To determine the development of physical qualities in the experiment, physical fitness testing was used using exercises and tests from the school curriculum [1]: 30-meter run, hanging pull-up while lying on a low crossbar, shuttle run 3x10 m, bending forward from a standing position on a gymnastic bench.

To determine the effectiveness of the technique, methods of mathematical statistics were used, and using Student's t-test, the significance of differences was determined at a 5 percent significance level [10].

**Results of the study and discussion.** At the beginning of the experiment, no statistically significant differences were found between the groups ($p>0.05$). These results indicate the relative homogeneity of the groups. After the pedagogical experiment, the indicators of all children participating in the experiment were also measured (see table).

The table shows that during the academic year, both groups showed improvements in all tests. In the CG, the indicators became higher by 5.3% in the "30-meter run" test and by 5.7% in the "3x10 m shuttle run" test ($p>0.05$). In the "Pull-up from a lying position" test, the indicators became higher by 13.3%, and in the "Forward Bend" test – by 10.8% ($p>0.05$). Despite the positive increase in indicators in the CG from the beginning to the end of the study, there was no significant increase.

In the EG, from the beginning to the end of the study, a significant increase in indicators was revealed for all tests:

1. "Running 30 meters" improvement by 18.2% ($p<0.05$);
2. "Pulling up from a lying position" improvement by 40.2% ($p<0.05$);
3. "Shuttle run 3x10 m" improvement by 10.3% ($p<0.05$);
4. "Forward bend" improvement by 43.2% ($p<0.05$).

The results in the EG may indicate the effectiveness of outdoor games in the process of physical education.

Play is an integral part of a child's life. In an entertaining form, the game uses a complex of physical education means (walking, running, jumping, throwing and others). Gaming activities are more attractive for children of primary school age. Playing in the classroom contributes to the formation of a positive emotional background, which ensures a positive attitude towards physical education classes in general [4, 5]. Outdoor games, as a means of physical education, contribute to solving the pressing issue of physical inactivity among schoolchildren [2, 3].

Indicators of physical qualities of schoolchildren after 8-9 years

| Tests | Groups | Before X±m | After X±m | Increase | p |
|---|---|---|---|---|---|
| 30m run (s) | CG | 7,5±0,5 | 7,1±0,4 | 5,3% | p>0,05 |
| | EG | 7,7±0,4 | 6,3±0,6 | 18,2% | p<0,05 |
| Pull-ups (number of times) | CG | 7,5±0,9 | 8,5±1,3 | 13,3% | p>0,05 |
| | EG | 7,2±1,1 | 10,1±1,2 | 40,2% | p<0,05 |
| Shuttle run 3x10 m (s) | CG | 10,5±1,3 | 9,9±1,2 | 5,7% | p>0,05 |
| | EG | 10,7±1,1 | 9,6±0,9 | 10,3% | p<0,05 |
| Tilt (cm) | CG | 4,6±0,4 | 5,1±0,5 | 10,8% | p>0,05 |
| | EG | 4,4±0,3 | 6,3±0,5 | 43,2% | p<0,05 |

The data obtained can be compared with the standards of the school curriculum [1]: in the "30-meter run" test, a grade of "5" is given to a student if he runs the distance in 6.0 s, a grade of "4" is 7.0 s, and a grade of "3" is 7.5 With. Before the start of the study, the average indicators of children in the CG corresponded to a rating of "3" (7.5 s), and the indicators of the EG were even lower (7.7 s). After the end of the study, children from the CG remained at the level of "3" points (7.1 s), and children from the EG showed an average result (6.3 s) for a score of "4".

As for the "Pull-up from a prone position" test, here a score of "5" is given for 14 pull-ups, a score of "4" for 10 pull-ups and a "3" for 6 pull-ups. Comparison with the average indicators at the beginning of the experiment in both groups shows that the level of strength abilities of schoolchildren corresponds to the rating of "3" (7.5 and 7.2 pull-ups). After the experiment, the level of strength abilities of schoolchildren from the CG remained at a grade of "3" (8.5 pull-ups), and children from the EG were able to reach a grade of "4" (10.1).

In the 3x10m shuttle run test, a grade of "5" in school can be obtained for a result of 9.5 s, a grade of "4" for 10.0 s, and a grade of "3" for 10.5 s. The level of development of coordination abilities in the CG was 10.5 s (score "3"), and after the study it became 9.9 s (score "4"). In the EG, the indicators before the pedagogical experiment were below the rating of "3" (10.7 s), and after the study, the average indicator of the children increased to a rating of "4" (9.6 s).

The Forward Bend test is used to assess the flexibility of schoolchildren. For it you can get a score of "5" if flexibility has reached a level of +9 cm, a score of "4" if flexibility is +6 cm, and a score of "3" for +3 cm. Thus, before the start of the study, in both groups the standard of the school physical education curriculum corresponded to a rating of "3" (+4.6 cm and +4.4 cm). After the pedagogical experiment, children from the CG remained at the level of "3" points (+5.1 cm), and children from the EG were able to achieve a score of "4" (+6.3 cm).

It is important to note that despite the fact that the data improved in the CG and became significantly higher in the EG, however, when comparing the results of both groups with the standards of the school curriculum, it was revealed that not a single indicator of the average value reached the rating of "5". This indicates a low level of physical development of modern schoolchildren.

**Conclusions.** The results of the pedagogical experiment showed that outdoor games are an effective means of increasing the physical activity of students in a general education organization.

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# Martial arts in the system of physical education of students of younger adolescence

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**Abstract**

**Objective of the study** was to develop and experimentally test the effectiveness of a set of exercises to improve the motor qualities of younger adolescents aged 10-11 years using hand-to-hand combat.

**Methods and structure of the study.** The study was conducted on the basis of secondary school No. 78 in the city of Rostov-on-Don, which was attended by 5th grade students aged 10-11 years. Methods of scientific research: pedagogical testing, pedagogical experiment, methods of mathematical statistics. The study included three consecutive stages. The experiment involved 30 boys of the fifth grade, who were divided into control and experimental groups of 15 people each.

**Results and conclusions.** The results obtained during the experiment clearly demonstrated the effectiveness of the developed complex used in physical education lessons and general physical training classes for students aged 10-11. The authors recommend using this complex when solving the problem of developing physical qualities in students when organizing physical education in a general education institution.

***Keywords:*** *students, martial arts, physical training.*

**Introduction.** The intensive educational process and insufficient amount of physical activity are sometimes often reflected in the physical indicators of schoolchildren. The content of physical education at school does not always meet the interests of students; classes are monotonous and do not sufficiently motivate children to perform physical exercises, which creates a problem for the development of physical qualities among students. One of the promising directions for solving this problem will be to supplement the system of physical education of students of early adolescence with the means of combat sports using the example of hand-to-hand combat.

This type of martial art originates from fist fights held in Rus'. Being a national treasure, a native Russian form of martial arts, hand-to-hand combat in the history of Russia has always had practical significance and acted as a means of training military personnel, special services, and law enforcement agencies. Nowadays, the arsenal of tactical actions of hand-to-hand combat accumulates almost all types of martial arts (boxing, freestyle wrestling, karate, sambo, judo) having the status of combat sports. The rules of combat exclude any methods of cruelty or the use of traumatic actions. The philosophy of hand-to-hand combat is based on the moral and spiritual norms of our people. A distinctive feature of martial arts is considered to be the patriotic education of those involved and the development of their sense of purpose, discipline, fortitude and perseverance of character, nobility and honor, courage, courage.

**Objective of the study** was to develop and experimentally test the effectiveness of a set of exercises

aimed at improving the motor qualities of younger adolescents using hand-to-hand combat.

Methods and structure of the study. The experimental study was organized from November 2022 to May 2023 (7 months), which was conducted in secondary school No. 78 in Rostov-on-Don, in which 5th grade students aged 10-11 years and 30 took part Human. The students were subsequently divided into control and experimental groups of 15 people each.

The study included a number of successive stages. At the first stage of the study, in November 2022, testing was carried out on the level of development of physical qualities in students using control tests in physical education. The results obtained assessed the level of physical fitness of schoolchildren at the beginning of the experiment, and made it possible to substantiate the ways of developing physical qualities. Tests to assess the level of physical fitness: 1000 m run, pull-up on a high bar, 30 m run, seated forward bend, 3x10 m shuttle run, standing long jump, lifting the body from a supine position, jumping rope.

Additionally, in both groups, the degree of development of psychomotor processes was determined based on the "Catching a Ruler" test (S.A. Dunamina), which involves assessing reaction abilities, and the "Running to numbered balls" test (K. Meinel, G. Schnabel), to determine the ability to rearrange motor actions.

The second stage of the study, conducted in November 2022, involved the development of a set of physical exercises using hand-to-hand combat, mainly aimed at developing physical qualities in children 10-11 years old during the experiment at a general education institution.

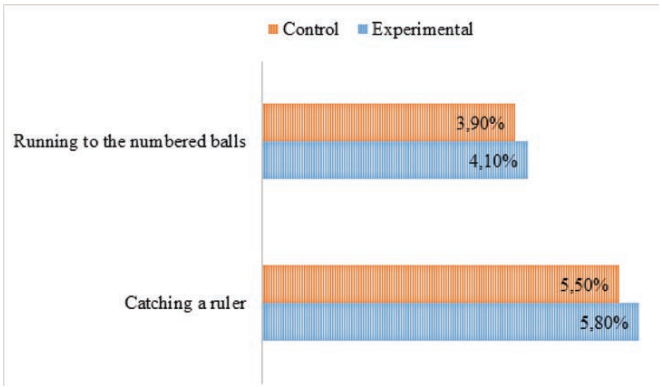


*Figure 1. Average increase in psychomotor scores*

The start of the third stage of the experiment was implemented from December 1, 2022 to May 2023. In the control group, classes were held according to the school physical education curriculum. The training program for the experimental group included special physical exercises using hand-to-hand combat for the initial level of training. The forms of organization of physical education for students in the experimental study included: physical education classes for 3 hours, extracurricular classes in general physical training (GPT) for 1 hour.

In classes with the experimental group, tools from the developed set of exercises were used with the predominant use of the game and competitive method. These exercises and games combined motor actions characteristic of hand-to-hand combat. The compiled complex included more than 20 exercises, divided according to their primary focus.

Results of the study and discussion. According to the results of testing in the control and experimental groups at the beginning of the experiment, the level of development of strength abilities, flexibility, general and coordination endurance in students had the lowest indicators compared to coordination, speed and speed-strength qualities. We can say that the level of development of physical qualities among students at the beginning of the experiment is approximately equal. The degree of development of psychomotor processes in the control group turned out to be higher in relation to the experimental group.

Statistical analysis of the resulting data at the end of the experiment showed a significant increase in

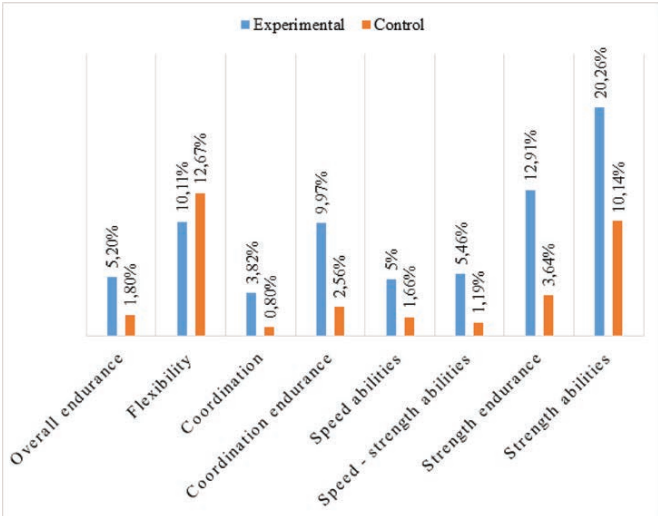


*Figure 2. Average increase in indicators of development of physical qualities*

physical indicators in the experimental group compared to the control group, with the exception of flexibility. The result of repeated assessment of psychomotor processes showed a slight difference in favor of the experimental group presented in Fig. 1. Ultimately, the use of an experimental set of physical exercises led to a significant superiority in the level of physical fitness of students in the experimental group over students in the control group, in almost all parameters presented in Fig. 2.

**Conclusions.** Thus, the results obtained during the experiment clearly demonstrated to us the effectiveness of the developed complex, used in physical education lessons and general physical training classes for 10-11 year old students. Therefore, as a recommendation, it would be advisable to use this complex in solving the problem of developing physical qualities in students of early adolescence when organizing physical education in a general education institution.

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# Formation of safe behavior of schoolchildren in daily activities through fire-applied sports

UDC 796.02


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**Abstract**

**Objective of the study** was to substantiate and develop program content based on students' classes in fire-applied sports in physical education at school as a means of developing safe behavior in children and adolescents in everyday activities and adapt it in practice.

**Methods and structure of the study.** A theoretical analysis of the content of physical education programs implemented today in general education institutions, an analysis and synthesis of methodological literature on fire-applied sports were carried out, and its relevance in the physical education of schoolchildren was determined. Based on the collected analytical material, an experimental physical education program for children in grades 5-11 has been developed, the content of which includes means, methods and forms of practicing fire-fighting sports at school.

**Results and conclusions.** Conducting additional classes in a general education institution using fire-fighting sports, according to the developed program, helps students develop an adequate level of response to critical life situations, strengthens knowledge about safe behavior, develops skills in overcoming extreme situations, and increases interest in classes fire-applied sports, develop moral-volitional and moral-psychological qualities of the individual.

The implementation of this program in secondary schools will allow children to instill knowledge and skills in the field of fire and rescue sports. Develop the necessary skills for safe behavior in everyday life in the face of various dangers.

***Keywords:*** *schoolchildren, theoretical analysis, fire-fighting sports at school.*

**Introduction.** One of the main conditions for making effective decisions by the state and society in order to implement complex and diverse tasks related to protecting the population from dangers of various types is of great importance the formation of the personality of a person who is ready to anticipate and is able to avoid the dangers of everyday life, and, if necessary, act competently in conditions of a critical situation.

Currently, society places increased demands on the safety of the younger generation, especially school-age children. Of course, the family is primarily responsible for ensuring the safety of the child's life. However, children are in school for a long part of the time, so the role and responsibility of the education system for preparing students on issues related to life safety, namely for developing safe behavior skills in schoolchildren, increases.

Currently, due to the aggravated geopolitical situation in the world, there is a noticeable increase in the number of emergency situations: terrorist attacks, wars, various man-made disasters, increased fire danger. Often children and adolescents become victims: they are injured, die due to their own negligence, inattention due to underestimation of the degree of risk and lack of a certain level of knowledge and skills to act in a dangerous situation.

The country's educational system is faced with the urgent task of preventing childhood injuries, developing in students the skills of safe behavior and readiness to overcome extreme situations, which meets the requirements of State educational standards. It is

teachers who must instill the skills of safe behavior in emergency situations.

Developing safe behavior skills in schoolchildren is a complex and lengthy process, which is based on an adequate attitude to reality and the potential capabilities of each student. It is necessary to begin the formation of these skills in physical education and life safety lessons.

Today, in general educational institutions, the disciplines "Fundamentals of Life Safety" and "Physical Culture" are not core disciplines and are not included in the list required for admission to higher education institutions. The low level of training of schoolchildren in the field of life safety indicates the need for a more effective organization of the process of teaching the basics of safe behavior; also, general physical training cannot fully ensure the readiness of schoolchildren to overcome various difficulties in extreme situations. Therefore, it is necessary to instill not only knowledge and skills, develop general physical qualities, but also to form sustainable skills and apply the acquired knowledge in practice.

**Objective of the study** was to substantiate and develop program content based on students' classes in fire-applied sports in physical education at school as a means of developing safe behavior in children and adolescents in everyday activities and adapt it in practice.

**Methods and structure of the study.** Students in grades 5-11 from schools in Zheleznogorsk took part in the study. The total sample of children was 380 people. At the initial stage of the pedagogical experiment, an analysis of the content of the educational process of schools was carried out with a view to the formation of safe behavior of students in everyday activities, what pedagogical means and forms are used in school practice for sustainable and safe behavior of children. The program content of children's physical education was also analyzed for the presence in it of applied programs for the formation

**Table 1.** *Educational and thematic lesson plan for the experimental program using fire and rescue sports equipment*

| No. | Program content | Number of hours | Classes | | |
|---|---|---|---|---|---|
| | | | 5-6 | 7-9 | 10-11 |
| 1. | Theoretical preparation | 48 | 16 | 16 | 16 |
| 1.1 | Safety precautions when conducting classes in fire-applied sports | 6 | 2 | 2 | 2 |
| 1.2 | Hygiene and human health. Procedure for providing first aid | 9 | 3 | 3 | 3 |
| 1.3 | History of fire protection and the Ministry of Emergency Situations. | 3 | 1 | 1 | 1 |
| 1.4 | Fire safety rules. Fire tactics. | 9 | 3 | 3 | 3 |
| 1.5 | Firefighting machinery and equipment | 6 | 2 | 2 | 2 |
| 1.6 | Classification of fires. Methods for stopping combustion | 6 | 2 | 2 | 2 |
| 1.7 | Types of emergency situations. Behavior in an emergency | 12 | 3 | 3 | 3 |
| 2. | General physical training (GPT): running, jumping, pull-ups, push-ups, relay races, outdoor games | 54 | 14 | 20 | 20 |
| 3. | Special (fire fighting) training: | 58 | 22 | 18 | 18 |
| 3.1 | Start, ready, run with stairs | 7 | 3 | 2 | 2 |
| 3.2 | Technique of running with a sleeve in a straight line and along the "boom" | 7 | 3 | 2 | 2 |
| 3.3 | Technique for overcoming the fence and "boom" | 10 | 4 | 3 | 3 |
| 3.4 | Wall climbing technique and overcoming obstacles of various heights | 7 | 3 | 2 | 2 |
| 3.5 | Attaching the barrel to the hose line | 3 | 1 | 1 | 1 |
| 3.6 | Attaching a Hose Line to a Branch | 3 | 1 | 1 | 1 |
| 3.7 | Extinguishing a baking sheet with burning liquid | 6 | 2 | 2 | 2 |
| 3.8 | Putting on firefighter clothes for a while | 6 | 2 | 2 | 2 |
| 3.9 | Sleeve picking technique | 3 | 1 | 1 | 1 |
| 3.10 | Quick sleeve rolling technique | 6 | 2 | 2 | 2 |
| 4. | Practical training (practice of all completed exercises) | 18 | 6 | 6 | 6 |
| 4.1 | Outdoor games with elements of fire-applied sports | 9 | 3 | 3 | 3 |
| 4.1 | Relay races with elements of fire-applied sports | 9 | 3 | 3 | 3 |
| 5. | Competitions in fire-applied sports | 6 | 2 | 2 | 2 |

of safe behavior of students in everyday activities. All this generally contributed to determining the need and scientific task aimed at introducing fire-applied sports into the physical education of schoolchildren as an effective means of developing safe behavior in schoolchildren in everyday activities.

**Results of the study and discussion.** To solve the scientific problem, an experimental program was developed with means of fire-applied sports, which is based on a set of various exercises from fire-applied sports to develop skills and habits of safe behavior in extreme situations in extracurricular activities.

At the beginning of our research, in order to identify schoolchildren's level of knowledge about the rules of safe behavior, ways to respond in situations of danger, as well as determine attitudes towards the need to develop safe behavior skills, we conducted an experimental study among students in grades 5-11 of a comprehensive school in Zheleznogorsk. The test questions were selected according to the general education program of the life safety course at the corresponding level of education. Each test consisted of 20 closed-ended questions with one or more answer options, into which we included several questions from a questionnaire test developed by Doctor of Psychology, Professor V.G. Maralov, and allowing us to determine the types of response in situations of danger.

The survey we conducted showed that among students of all classes, knowledge about the rules of safe behavior is at average and low levels, and the study also identified the following dominant types of response in situations of danger: adequate - 20%, anxious -37%, ignoring - 43%.

Thus, 80% of respondents have experience of incorrect, destructive behavior, which acts as a cause of dangerous situations; their experience recognizes their lack of safe behavior skills and expresses a desire to learn this, in particular, in the process of additional training in firefighting sports.

Then extracurricular activities were organized according to the developed experimental program.

The program includes not only theoretical and practical classes, but also mandatory competitions in fire-applied sports in both individual and team competitions.

Theoretical classes consisted of modeling educational and professional situations where it is necessary to demonstrate knowledge and skills of safe behavior using active (games, training) and interactive (master classes, round table, interactive lessons using video materials) teaching methods and techniques.

Schoolchildren were immersed in various educational and professional situations and proposed solutions to problems, as a result of which they gained personal experience in overcoming certain dangerous situations. Next, an analysis of the actions they proposed was carried out, typical mistakes made in such situations were identified, a detailed analysis of each specific situation, and an analysis of typical mistakes.

After conducting classes according to the developed program, we organized a repeat survey, the results of which were distributed as follows: adequate - 68%, anxious - 20%, ignoring - 12%. Analysis of the study showed that 68% of the schoolchildren surveyed know the sequence of actions in solving problems within the framework of any dangerous situation, and spoke about the need and importance of special preparation for actions in dangerous situations.

**Conclusions.** Conducting optional classes in fire-applied sports was an effective means of developing schoolchildren's readiness to overcome extreme situations, increased their interest in issues of adequate behavior in extreme living conditions, and contributed to the development of the ability to ensure their own safety and the safety of others.

This program will allow you to acquire not only the necessary theoretical knowledge in the field of life safety, but will also prepare schoolchildren to act in non-standard, emergency life situations, and will also allow them to develop the necessary volitional, moral and psychological qualities.

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# Development of balance in children with visual deprivation during adaptive physical education classes

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**Abstract**

**Objective of the study** was to compare indicators of balance development in children with visual deprivation engaged in different types of adaptive physical education - goalball or ice skating in extracurricular activities.

**Methods and structure of the study.** During the comparison, two experimental groups were formed, each with nine children with visual deprivation of a different nature. Each group had one participant with total blindness. The age of the participants is 8-12 years. As part of extracurricular activities, group No. 1 attended goalball classes, group No. 2 attended skating classes. The dynamics of the development of static balance were determined using the Romberg heel-toe test with open eyes, the Romberg test with closed eyes, and the E.Ya. Bondarevsky test. The dynamics of development of dynamic balance was determined using the test according to V.I. Lyakh.

**Results and conclusions.** At the end of the scientific work, an analysis of the results of performing the Romberg test with eyes closed showed almost the same increase in indicators in both groups - 39.6% in children involved in goalball and 39.1% in children involved in skating, in terms of the Romberg heel-toe test There is a significant difference: among children involved in ice skating, the increase was 116.6%, while among children involved in goalball - 52.9%. Results in the test by E.Ya. Bondarevsky indicate a greater increase in indicators in the group of children involved in goalball than in the group of children involved in skating: 160% and 133%, respectively.

According to the results of the test to determine dynamic balance (V.I. Lyakh), in group No. 1 there is an increase of 37.5%, in group No. 2 - 36.8%, however, there is a statistically significant decrease in the average value only in group No. 1.

The results of the study can be applied in the development of rehabilitation programs to develop coordination (balance) for children with visual deprivation.

***Keywords:*** *visual deprivation, balance, goalball, skating, adaptive physical education.*

**Introduction.** Among the main types of persistent disorders that cause childhood disability, one of the leading places is occupied by sensory dysfunction, and among them – visual impairment. [5]. Complete or partial visual deprivation in children significantly affects their life activities [6]. The consequence of impaired functioning of the visual analyzer is a limited understanding of the world around us (impaired spatial images, sensory cognition of the world), which is expressed in the lag of blind and visually impaired children behind healthy peers in mental and physical development [7]. Developmental disorders lead to motor coordination disorders [6]. Due to an inadequate perception of the environment, a child with visual deprivation has difficulties associated with the accurate, economical and coordinated performance of motor actions, which characterizes underdeveloped coordination abilities.

Among the coordination abilities, which are responsible for the ability to regulate and manage one's actions in accordance with the assigned tasks, balance is of particular importance for blind and visually impaired children. Improving balance can greatly influence walking stability and reduce the risk of injury from falls [8].

Components that play a vital role in balance control include the visual, vestibular, and somatosensory systems. Thanks to them, a person experiences static sensations that help maintain a stable body position in space [4]. Thus, disturbances in the functioning of the visual analyzer negatively affect the development of balance.

There is an opinion that children with visual analyzer disorders have poorly developed balance in comparison with healthy peers [9]. In some scientific works, goalball is considered as a means of developing balance in children with visual impairments [2, 3], the influence of skating is not sufficiently represented in the scientific literature. The development of balance in children with visual deprivation can be carried out both within the framework of classroom and extracurricular activities in adaptive physical education. Extracurricular activities do not have strict regulations regarding time characteristics, the number of children involved, or the location of the classes. This form of organizing classes is aimed at meeting children's needs for physical activity, emotional motor activity, communication and self-realization [6].

**Objective of the study** was to compare indicators of balance development in children with visual deprivation engaged in different types of adaptive physical education - goalball or ice skating in extracurricular activities.

**Methods and structure of the study.** Scientific work was carried out at the Center for Adaptive Physical Culture of Petrozavodsk State University and the sports club "Energy" of correctional boarding school No. 23 in Petrozavodsk for five months. Two experimental groups were formed, each with nine children with visual deprivation of a different nature - myopia, retinopathy, retinitis pigmentosa, astigmatism, strabismus, nystagmus, amblyopia, each group had one participant with total blindness. The age of the participants is 8-12 years.

As part of extracurricular activities, group No. 1 attended goalball classes, group No. 2 attended skating classes. All classes were held twice a week.

The main part of goalball classes included exercises to practice elements of the technique of throwing the ball in different directions, catching, and changing body positions on the playing court. At the skating rink, students performed exercises such as sliding on two legs, on one leg, rotation, moving around objects, etc. A characteristic feature of all classes was the performance of complex coordination exercises aimed at maintaining balance in various positions.

The dynamics of development of static and dynamic balance were determined using the Romberg heel-toe test with open eyes, the Romberg test with closed eyes (narrow stance, hands in front of you), the E.Ya. Bondarevsky test (stand on one leg, the other leg is bent and its heel touches the knee joint of the supporting leg, hands on the belt, head straight) and the V.I. Lyakh test (from the starting position "standing on a gymnastic bench, hands on the belt", performing three full rotations in one direction as quickly as possible without losing balance). Comparison of indicators was carried out using the nonparametric Wilcoxon Mann–Whitney test. Differences were considered statistically significant at $p<0.05$.

**Results of the study and discussion.** The results of the test to determine dynamic balance (V.I. Lyakh) indicate a statistically significant decrease in the average time for performing rotations without loss of balance from 8 to 5 s in group No. 1 and a statistically insignificant decrease in the average time from 19 to 12 s in group No. 2.

In group No. 1, the average time to perform the Romberg heel-toe test increased from 17 s to 26 s. It should be noted that among the results obtained at the beginning of the study, one significantly exceeds the others, which makes it impossible to talk about statistically significant differences between the results of the two samples. It was found that the highest result belonged to a child with a weak visual impairment (mild strabismus) compared to other participants in the experiment. In this regard, this result of performing the Romberg heel-toe test was excluded from the sample, which led to a decrease in the mean and median and, as a consequence, to the emergence of statistically significant differences between the samples.

When performing the Romberg test with eyes closed, a statistically significant increase in the average time of holding the pose was observed from 53 s to 74 s, which indicates the development of the ability to maintain balance in a static pose. Analysis of the data obtained showed that the result of one child obtained at the beginning of the study was significantly lower (22 s) compared to the results of other children and the average time for performing the Romberg test with eyes closed (53 seconds). The reason for this may be severe visual impairment, which significantly limits the perception of the surrounding space, which, in turn, affects the development of balance. After five months of train-

ing, the result increased to 38 seconds and was already comparable with the results of other children.

The average value of the time of holding a pose when performing the test by E.Ya. Bondarevsky changed from 5 to 13 s.

In group No. 2, there was an increase in the average time of holding the body position without loss of balance in a given position from 6 to 13 s when performing the Romberg heel-toe test and from 23 to 32 s when performing the Romberg test with eyes closed. According to the test results of E.Ya. Bondarevsky observed a statistically significant increase in the average time of maintaining a body position without loss of balance from 3 to 7 seconds. By the end of the study, one of the results of the test by E.Ya. Bondarevsky was more than twice as high as the others. This result belonged to a child with mild impairments of the visual analyzer, in contrast to other children who took part in the study.

**Conclusions.** It was revealed that indicators of balance development in children with visual deprivation engaged in various types of adaptive physical education - goalball or ice skating - have positive dynamics, however, in group No. 2 a more pronounced effect in the development of static balance is observed.

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# Opportunities and barriers to involving persons with health limitations and disabilities in physical education and sports

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**Abstract**

**Objective of the study** was to analyze the factors that promote and hinder the involvement of people with health limitations (disabilities) in systematic physical education and sports.

**Methods and structure of the study.** An all-Russian sample survey was conducted: of the population with health limitations, aged from 18 to 80 years and older (604 respondents with health limitations, including disabilities, of which: 22.2% with the first disability group, 31.5 % - second, and 38.2% - third, there is no disability, but 8.1% of respondents have health restrictions); survey of coaches and instructors working in the field of adaptive sports: sports of the deaf, sports of the blind, sports of the LMS (persons with lesions of the musculoskeletal system), sports of PID (persons with intellectual disabilities) (323 experts, among whom 67.8% have work experience in adaptive sport for over five years). The online survey was conducted using specially designed questionnaires. More than half (58.2%) of the surveyed coaches and instructors work with both adults and children. The categories of disabled people with whom coaches and instructors work include persons with the following types of nosologies: musculoskeletal disorders (65.3%), hearing impairment (41.8%), visual impairment (25.7%), mental disorders (35.6%).

**Results and conclusions.** It has been established that a significant number of people with disabilities (disabilities) are aware of the importance of physical activity for maintaining and strengthening health, for improving psychological well-being and more successful socialization, and they are actively involved in physical education and sports. Three groups of barriers have been identified that impede the involvement of this category of the population in the field of physical education and sports: individual barriers; barriers related to the availability of physical culture and sports infrastructure; barriers caused by dissatisfaction with existing conditions for physical activity.

***Keywords:*** *persons with health limitations and disabilities, physical education, sports, activity, opportunities, barriers.*

**Introduction.** Physical culture and sports play an important role in the formation of a healthy lifestyle of the population. For people with health limitations and disabilities, their importance cannot be overestimated, since, as a number of authors note, they are one of the main ways of physical and mental rehabilitation, as well as social integration [1, 2, 3, 4].

According to Rosstat, as of January 1, 2023, there were 10,933 thousand citizens in the country with various disability groups, including disabled children. According to preliminary estimates, in 2023 there will be 74.7 disabled people per 1000 people in the Russian Federation. At the same time, as noted in the report of the Ministry of Sports of the Russian Federation at a meeting of the Council for Disabled People under the Federation Council of the Federal Assembly of the Russian Federation on April 5, 2023, as of January 1, 2023, the share of disabled people involved in physical education and sports amounted to 21% of the total number disabled people who do not have medical contraindications for the relevant activity [5, p. 12].

Creating favorable conditions for physical education and sports for people with health limitations and disabilities, as well as their involvement in physical culture and sports activities are the priority objectives of a number of strategic documents at the national lev-

el, including the federal project “Sport is the norm of life” and the national project “Demography” , national programs of the Russian Federation “Development of physical culture and sports” and “Accessible environment”, “Strategy for the development of physical culture and sports in the Russian Federation for the period until 2030”, Action plan to create conditions for physical culture and sports for disabled people and persons with health limitations and disabilities, including disabled children until 2030.

According to the state program “Development of Physical Culture and Sports”, by 2030 the proportion of people with disabilities who are systematically involved in physical culture and sports should increase to 30% of the total number who have no medical contraindications for this type of activity [5, p. 23].

To achieve this goal, it is necessary to study the needs of people with disabilities in physical education and sports, their behavioral patterns in this area, and also to identify factors influencing the decision to participate in physical education and sports activities, which determines the relevance of this study.

Objective of the study was to analyze the factors that promote and hinder the involvement of people with health limitations (disabilities) in systematic physical education and sports.

**Methods and structure of the study.** The main methods for collecting primary information were a nationwide sample survey of the population with disabilities aged 18 to 80 years and older, as well as a nationwide sample survey of coaches and instructors working in the field of adaptive sports: sports of the deaf, sports of the blind, sports of the LMS (persons with lesions of the musculoskeletal system), sports of PID (persons with intellectual disabilities). An Internet survey was conducted using specially designed questionnaires, and two focus groups were conducted.

604 respondents (55.5% women and 44.5% men) with health limitations, including disabilities, took part in the Internet survey. Among them, 22.2% have the first disability group, 31.5% have the second, and 38.2% have the third group. There is no disability group, but 8.1% of respondents have health restrictions. Among the respondents, 42.7% were representatives of young people (18-39 years old), 36.0% of the middle generation (40-59 years old) and 21.3% of the older generation (60 years old and older). Among the respondents, 30.0% have incomplete and complete secondary education, 29.1% have primary and secondary vocational education, and 40.9% have higher education. 12.6% of respondents live in megacities (Moscow and St. Petersburg), 16.7% live in cities with a population of over a million, 11.4% live in large cities with populations ranging from 500 thousand to 950 thousand residents, and 11.4% live in medium-sized cities (100 – 500 thousand) – 11.4%, in small towns (less than 100 thousand) – 18.8%, in urban settlements – 6.5%, in rural areas – 13.1%.

323 experts answered the questionnaire for coaches and instructors, of which 67.8% have more than five years of experience in adaptive sports, 58.2% work with both adults and children. The categories of disabled people with whom coaches and instructors work include persons with the following types of nosologies: musculoskeletal disorders (indicated by 65.3% of respondents), hearing impairment (41.8%), visual impairment (25.7%), mental disorders (35.6%).

**Results of the study and discussion.** The majority (78.6%) of respondents with disabilities engage in physical education and sports in one form or another, while 52.3% reported that they do this as part of a special program of adaptive physical education and sports, and of these, a total of 64.0 % exercise regularly at least three times a week.

More than half (54.1%) of respondents attend sports clubs, and 70.1% responded that in 2022-2023. participated in sports competitions. The top 5 types of sports and physical exercises they engage in include: swimming (32.5%), physical therapy (31.9%), training on exercise machines (30.3%), walking (30.1%) and general physical fitness (25.3%). According to coaches and instructors, in those settlements where they work with people with disabilities, competitions are most often held in swimming (47.4%), table tennis (47.4 %) and athletics (41.5%). At the same time, 53.6% of experts are confident that people with disabilities show a very high interest in physical education and sports. 17.4% of respondents do not engage in physical education and sports, of which every third (31.4%) reported that the reason for this is disability, and 21.0% of respondents do not engage in physical activity due to medical contraindications.

The presence of sports facilities adapted for them in the locality was noted by 61.1% of respondents, while 26.3% reported the absence of facilities. Surveyed persons with disabilities believe that they have opportunities for: developing their physical capabilities (67.7%), participating in competitions (62.4%), engaging in adaptive physical education (60.3%), feeling attention, care and help from other people

(59.1%), practicing the desired sport (51.2%), receiving special sports training (49.2%), comfortable use of stadiums and sports facilities (49.0%), convenient use of transport to sports and recreational facilities (45.2%) and receiving all required assistance and support from authorities and local governments (42.1%). But at the same time, just creating conditions is not enough; internal motivation is needed to encourage people with disabilities to engage in physical activity.

Based on the results of a survey of people with disabilities, a rating of motives was compiled that actualize their need for physical education and sports, the first line of which is occupied by the motive of maintaining and strengthening health (70.1%). In second and third place by a large margin are the motives for creating a healthy lifestyle (32.9%) and improving mood and enjoying activities (30.7%).

It is noteworthy that, according to the surveyed coaches and instructors, the following rating of significant motives of people with disabilities to engage in physical activity was obtained: to achieve certain sports results (48.7%), maintain and improve health (46.5%), communicate with friends (41 .9%), increase the level of physical fitness (38.7%), test one's strength, overcome psychological barriers (29.7%), improve well-being (21.6%), improve mood, enjoy activities (15.5 %), expand the circle of acquaintances (14.8%), reduce neuro-emotional overload (4.8%), maintain and improve the figure (3.2%), relieve fatigue, maintain performance (1.0%).

According to the majority of respondents with disabilities involved in the field of physical education and sports, physical activity greatly helps them: maintain physical fitness (73.2%), develop motor abilities (73.0%), form and strengthen a positive attitude towards active forms of recreation (62.9%), form correct ideological views on a healthy lifestyle (56.8%), develop a sense of pleasure (55.8%), develop moral-volitional and moral qualities (60.3%).

Based on survey data, we can identify three groups of factors that hinder the involvement of persons with disabilities in physical education and sports:

1. Individual barriers caused by the state of health, work schedule and lifestyle of a person, as well as his attitude to physical education and sports: medical contraindications, lack of free time, heavy workload, increased fatigue, fear of seeming ridiculous, laziness, lack of willpower. Experts also noted the presence of other interests and hobbies among people with disabilities.

2. Barriers associated with the availability of sports infrastructure adapted to the needs of people with disabilities: 40.6% of coaches and instructors and 14.3% of people with disabilities noted the absence or inconvenient location of sports facilities. For 17.2% of respondents from among persons with disabilities, an obstacle is the lack of free sections, classes or their high cost.

3. Barriers due to dissatisfaction with the existing conditions for physical activity: 42.0% of respondents with disabilities responded that they were not satisfied to one degree or another with the conditions for physical education and sports existing in their locality, and also drew attention to the insufficiency conditions in specialized organizations - the lack of additional services (massage, solarium, steam room and others) for people with disabilities (33.5%), the lack of a flexible lesson schedule that takes into account the physical capabilities of people with disabilities (20.8%); to the lack of specialized equipment, inventory (27.3%) and individual training programs taking into account the existing nosology (25.7%).

Almost two-thirds (64.4%) of coaches and instructors believe that in the locality where they work, there are rather insufficient and absolutely insufficient sports facilities that people with disabilities need, and 27.2% - that sports organizations providing services people with disabilities are not sufficiently provided with trainers and instructors.

Removing barriers that do not depend on the individual life circumstances of people with disabilities will contribute to an increase in the level of involvement of this category of the population in physical activity. For example, in the next year, 26.7% of respondents would start physical education and sports if all factors beyond their control were eliminated, and another 35.2% would "rather start." The removal of barriers, according to focus group participants, can be facilitated by the popularization of sports, including by participants in the Paralympic movement, as well as educational work about the role of physical education and sports in people's lives in the media, including social networks.

**Conclusions.** The results of the study indicate that a significant number of people with disabilities are aware of the importance of physical activity for maintaining and strengthening their health, for improving psychological well-being and more successful socialization. Moreover, they are actively involved in physical education and sports. The opportunities for people with disabilities to engage in such activities are

expanding. At the same time, we must not lose sight of the factors that impede this.

To improve conditions and overcome barriers to the involvement of people with disabilities in the field of physical education and sports, it is very important to hear the voice of those for whom these conditions are created. Judging by the survey data, the preferred forms of organized physical activity for this category of the population are training on exercise machines in various centers, swimming, and table tennis. It is no coincidence that a significant portion of respondents expressed a desire to have a swimming pool (43.5%), a fitness center/gym/gym (35.9%), and a sports ground with exercise equipment (32.8%) in their locality. The need to develop a sports infrastructure for people with disabilities was indicated by 48.1% of respondents with disabilities, and 40.6% recommended strengthening efforts to popularize sports.

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# Choreotherapy in the complex correction of motor stereotype in persons with down syndrome under inclusion conditions

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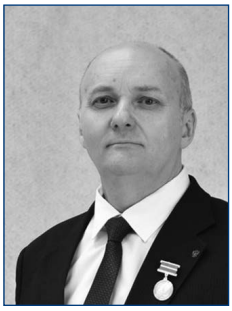

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**Abstract**

**Objective of the study** to evaluate the effectiveness of complex correction of motor stereotype in persons with Down syndrome (DM) in the process of practicing choreotherapy in inclusion conditions.

**Methodology and organization of the study.** Within the framework of the Inclusive Sports Saturday project (2021-2022), a sequential experiment was conducted to study the influence of choreotherapy classes based on the use of complex movements combined into one semantic sequential, rhythmic, motor act in order to correct postural posture control in people with Down syndrome.

**The results of the study and conclusions.** Classes with children with diabetes according to the method of choreotherapy allow you to actively engage and develop such qualities as mechanical memory, imitative abilities, musical memory, sense of rhythm, actively affects the vestibular system, improves muscle tone and coordination of movements, which generally has a positive effect on the formation of correct posture.

***Keywords:*** *Down syndrome, choreotherapy, motor stereotype, inclusive sports activities.*

**Introduction:** The peculiarity of the motor stereotype of children with Down syndrome (DM) is primarily due to: the syndrome of diffuse muscular hypotension in combination with coordination disorders of varying severity, motor awkwardness, lack of formation of subtle, differentiated motor acts.

In 30% of children with diabetes, pyramidal symptoms occur, while its severity depends on the degree of structural changes in the brain, cerebrospinal fluid dynamics, a decrease in the density of nervous tissue, a decrease in the volume of cerebellar structures, immaturity and pathological activity of cortical neurons, a violation of the synthesis and functions of neurotransmitters [5].

In addition to motor disorders, children with DM have cognitive deficits in the form of disorders of mental and speech development and difficult adaptation to society [2]. Especially important is the fact of damage to the hippocampus, a critical structure of the brain responsible for spatial memory and consolidation of short-term memory into long-term memory. This structure is responsible not only for the ability to learn and memory, but also has extensive connections with many brain structures.

Therefore, the development of new programs of adaptive physical culture of correctional and compensatory orientation is undoubtedly an important step in helping special children learn to live a full life, develop cognitive mental processes, emotional and volitional regulation [4]. The strengths of people with DM include a good mechanical memory, imitative abilities, musical memory, curiosity, which is why nami chose dance as the main means of motor correction.

Taking into account the above-mentioned features of the motor stereotype of people with DM, the methodological support of dance-movement therapy (TDT) has specific differences, both in the general physical training of this contingent, and the features of psychomotor expression as the leading method of intervention that allows consolidating short-term memory into long-term memory [6].

Despite the fact that dance-movement therapy (TDT) techniques are used in the treatment of children and adults with various disorders, there is a limited number of studies devoted to the use of this technology for correctional purposes in children with DM [1,3].

**The purpose of the study:** to evaluate the effectiveness of complex correction of motor stereotype in people with Down syndrome during choreotherapy in inclusion conditions.

**Methodology and organization of the study**: the study was conducted on the basis of the Volga GUFKSiT within the framework of the project "Inclusive Sports Saturday" [7], organized by the Department of AFKiBJ and the Tatarstan regional branch of the Special Olympics of Russia (Kazan). A technique of choreotherapy (the use of dance, plastics and rhythmics for the correction and prevention of motor disorders) was developed, aimed at the complex correction of the motor stereotype in people with Down syndrome. The methodology is based on the principle of sequential execution of complex coordinated dance movements.

The developed technique was tested by a sequential experiment in which persons with diabetes aged 11-16 years (n-8, 5 girls and 3 boys) took part. Classes lasting 60 minutes were held once a week. The total course was 26 classes.

The methodological features of choreotherapy classes are presented below.

In the preparatory part (10 minutes) of the lesson, asymmetric cheerleading exercises are performed, which contribute to the activation of the nervous, respiratory and cardiovascular systems. The exercises are performed at a slow, medium pace.

The main part (40 minutes) consists of three logically related sets of physical and dance exercises. Corrective and developmental exercises aimed at normalizing the tone of the deep back muscles of the craniosacral system are based on myofascial principles and the specificity of physical exercises with elements of respiratory gymnastics. The goal is to correct the asymmetric muscle tone to maintain the correct biomechanics of the vertical position of the body [8].

To strengthen the muscles of the cervical-thoracic and thoracic spine (a specific effect on the correction of instability of the segments of the cervical spine), statodynamic exercises are performed lying on your back with your head on a yoga cube. The technique of the exercise is controlled by the tutor.

The second part of the lesson is aimed at consolidating the feeling of the spatial position of the body. The task is to improve the coordination of body movements in space to normalize balance, posture, and develop static endurance of the trunk muscles. Three standard ballet positions were used to solve this problem.

1. The first position: the legs are on the same line, the heels are brought together, the socks are spread apart. For a stable position in this position, the tutor controls the position of the legs;

*Indicators of postural control of persons with Down syndrome in the experimental group during the pedagogical experiment, ($X \pm \sigma$)*

| Indicator F.I.O | Expert evaluation | | Test «Swallow» | | Test «Corner» | | Test Romberg | | test «Walking the line» | |
|---|---|---|---|---|---|---|---|---|---|---|
| standard | 7 points | | 20 sec | | 15 sec | | 15 sec | | 17 sec | |
| 1-the beginning / 2 - end of the experiment | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 |
| 1. Child № 1 | 4 | 7 | 13,4 | 15,3 | 6 | 10,3 | 7,5 | 10,2 | 21 | 18,9 |
| 2. Child № 2 | 3 | 6 | 12,1 | 16,5 | 11,3 | 12 | 9 | 13 | 24,4 | 20 |
| 3. Child № 3 | 3 | 6 | 9,5 | 14 | 9,5 | 14,6 | 11,2 | 15,2 | 22,7 | 17,5 |
| 4. Child № 4 | 3 | 5 | 11,4 | 12,1 | 10,7 | 11,9 | 7,9 | 11,4 | 23,1 | 18,1 |
| 5. Child № 5 | 4 | 8 | 13,9 | 17,4 | 11 | 10,5 | 8,9 | 13,8 | 26,3 | 20,2 |
| 6. Child № 6 | 3 | 6 | 10,9 | 14,6 | 9,8 | 13,4 | 8,8 | 12,9 | 24 | 19,7 |
| 7. Child № 7 | 3 | 6 | 8,5 | 13,2 | 7,5 | 13,8 | 10,1 | 13,4 | 20,3 | 16,8 |
| 8. Child № 8 | 5 | 8 | 11,3 | 13,9 | 12,7 | 14,3 | 7,1 | 11 | 24,5 | 19,2 |
| X cp | 3,5 | 6,5 | 11,38 | 14,63 | 9,81 | 12,6 | 8,81 | 12,6 | 23,29 | 18,8 |
| δ | 0,75 | 1,06 | 1,8 | 1,73 | 2,16 | 1,67 | 1,35 | 1,64 | 1,95 | 1,22 |
| m | 0,26 | 0,37 | 0,64 | 0,61 | 0,76 | 0,59 | 0,48 | 0,58 | 0,69 | 0,43 |

Note: - is the mean square deviation, m - is the error of the arithmetic mean.

2. The second position is derived from the first. One of the legs is moved to the side, so the tutor controls that there is a distance between the heels equal to the foot. Socks are still looking to the sides;

3. The third position is universal in choreography. The heel of the right foot is placed in the middle of the left foot, the socks are spread apart. The movement of the hands is also strictly regulated and is under the constant supervision of the tutor. The shoulders are relaxed, the arms along the torso are lowered down.

The main part of the lesson ends with a dance practice with an instructor and volunteers who carry out visual control over maintaining posture. Elements of such dances as: cha-cha-cha, salsa, waltz are used.

The final part of the lesson (10 minutes) consists of breathing exercises, stretching exercises, relaxation and relaxation, aimed at gradually reducing the load and bringing the students into a relatively calm state. It is performed at a slow pace.

Organizational and pedagogical conditions were determined for the effective implementation of the developed methodology:

- preliminary (before the start of the course) determination of exercise tolerance (Harvard step test with a simplified formula of the IGST index = t x 100 / f x 5.5 where t is the climbing time in seconds, f is the heart rate). A feature of the testing is the game form of the test with elements of cheerleading and constant motivation of the subjects.

- the beginning and end of classes are clearly regulated, obvious to the child and forms a kind of frame inside which the child feels comfortable and confident.

- inclusion of parents and assistance of tutors during classes.

- the use of special equipment (gym mat, cheerleading pom-poms, yoga cubes, choreographic machine, mirrors).

The impact of the applied means was tested in a pedagogical experiment, the results of which are presented in Table 1.

As can be seen from the data in the table, each student according to the experimental method had a sufficient improvement in the indicators of postural control.

**Conclusions:**

1. For personal lessons with children with diabetes, the cryotherapy technique allows you to actively engage and develop such qualities as mechanical memory, imitative abilities, musical memory, sense of rhythm.

2. Choreotherapy exercises actively affect the vestibular system, improve muscle tone and coordination of movements.

3. The proposed method of choreotherapy has a preventive effect and contributes to the correct formation of posture, the development of coordination abilities.

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# Management of preparation of highly qualified decathleters based on the development of a competitive activity model

UDC 796.093.62

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**Abstract**

**Objective of the study** was to develop a methodology for managing the training of highly qualified decathletes based on creating a model of competitive activity in decathlon.

**Methods and structure of the study.** The scientific work includes an analysis of documentary materials, a method of mathematical statistics, and a pedagogical experiment.

**Results and conclusions.** Based on the analysis of indicators of competitive activity in certain types of decathlon of the world's leading all-around athletes using regression analysis, a model of competitive activity in track and field decathlon was formed. The model of competitive activity allows: to compare the results of an athlete in certain types with the average statistical indicators for a given result in the decathlon, to analyze the results of a decathlete in certain types, to identify lagging and dominant types of decathlon for a given athlete, to plan results in certain types of decathlon for the next macrocycle of training and on this based on programming the training process for the upcoming annual cycle.

***Keywords:*** *all-round track and field athletes, decathlon, competitive activity, modeling, management of the training process.*

**Introduction.** Target planning for the training of qualified athletes at the first stage should be based on the planning of indicators of the competitive activity of athletes [4], and for track and field decathletes - indicators in certain types of all-around for the result in the decathlon planned for the next macrocycle [3, 6]. This is where planning of the annual cycle begins - the planned competitive result in all-around requires the coach and athlete to have a thoughtful and reasonable forecast of results in certain types of all-around for the next sports season [2].

To objectively assess an athlete's strong and weak all-around types, it is necessary to create an average statistical model of results in individual types of decathlon for a certain competitive result in the decathlon [1, 5].

**Objective of the study** was to develop a methodology for managing the training of highly qualified decathletes based on creating a model of competitive activity in decathlon.

**Methods and structure of the study.** The scientific work includes an analysis of documentary materials, a method of mathematical statistics, and a pedagogical experiment.

**Results of the study and discussion.** At the first stage of the research carried out by employees of a comprehensive scientific group, the task was set to develop, based on a statistical analysis of the competitive results of highly qualified decathletes in certain types of the program, an average model of competitive activity in men's all-around in the range of results of 7700-8700 points. This problem was solved through statistical analysis of the results in certain types of decathlon of the world's strongest all-around athletes based on the results of the world champion-

ships. To analyze the dynamics of competitive results in individual types of decathlon, the 10 best results in the decathlon at each of the 17 past World Athletics Championships (1983-2019) were selected. The sample included only the results of athletes who competed in all 10 types of the all-around program.

The regression analysis of the performance indicators of athletes in certain types of decathlon made it possible to determine the regression equations on the basis of which model indicators in individual types of decathlon were calculated for a certain competitive result in the decathlon in the range of results of 7700-8700 points (Table 1).

Model performance indicators in certain types of decathlon, when compared with an athlete's individual indicators, allow:

- compare the athlete's results in individual events with the average statistical indicators for a given result in the decathlon;

- analyze the results of a decathlete in individual events, highlight the lagging and dominant types of decathlon for a given athlete;

- outline the strategy and tactics of preparing an athlete for the upcoming macrocycle, highlighting the types that should be given more attention and time in preparation;

- plan results in individual types of decathlon for the next macrocycle of training and, on this basis, program the training process for the upcoming annual cycle for all components of training (special physical and technical training of the athlete, volume, intensity and distribution of training means at the stages of the annual cycle).

Below, using specific examples of highly qualified athletes, leading decathletes of the country, winners of the 2022 National Championship, an analysis of the individual correlation of results in certain types of decathlon is shown, the lagging and strong disciplines of each athlete are highlighted (Fig. 1-3). The circle in the diagram corresponds to the average statistical indicators for the athlete's results shown in the decathlon. The indicators inside the circle are below the model indicators (conditionally lagging types of the athlete), the indicators outside the circle are higher than the model indicators for a given result (conditionally strong types of the athlete).

At the first stage, the performance indicators of decathletes in individual all-around events were compared with models for a given competitive result in order to determine the athlete's lagging and strong all-around types.

Honored Master of Sports Sh-ev I. The strength of the athlete's special preparedness is the relatively uniform development of individual types of decathlon. The athlete is strong in almost all types of all-around,

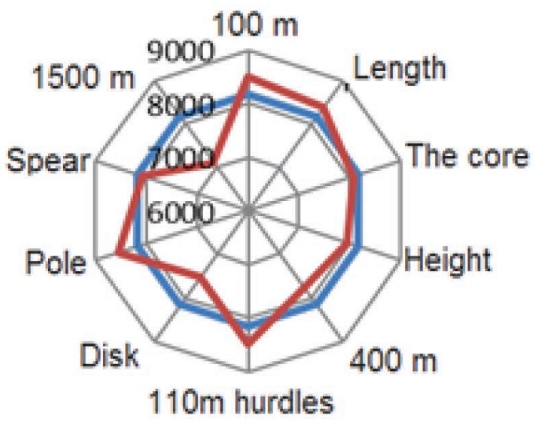


*Figure 1. Indicators of competitive activity of HMS Sh-ev I. in certain types of all-around relative to the average statistical model for a result of 8165 points. in the decathlon*

*Table 1. Model characteristics of competitive activity of all-around athletes in certain types of decathlon*

| Decathlon event | All-around points | | | | | |
|---|---|---|---|---|---|---|
| | 7700 | 7900 | 8100 | 8300 | 8500 | 8700 |
| 100 m, s | 11,20 | 11,12 | 11,03 | 10,95 | 10,87 | 10,79 |
| Length, m | 7,20 | 7,28 | 7,36 | 7,44 | 7,52 | 7,60 |
| Core, m | 14,05 | 14,32 | 14,60 | 14,86 | 15,13 | 15,40 |
| Height, m | 1,92 | 1,95 | 1,98 | 2,01 | 2,03 | 2,06 |
| 400 m, s | 50,30 | 49,85 | 49,35 | 48,85 | 48,35 | 47,90 |
| hurdles 110 m, s | 15,00 | 14,82 | 14,64 | 14,46 | 14,28 | 14,10 |
| Disk, m | 44,50 | 44,90 | 45,30 | 45,70 | 46,10 | 46,50 |
| Pole, m | 4,40 | 4,54 | 4,68 | 4,82 | 4,96 | 5,10 |
| Spear, m | 58,80 | 60,10 | 61,40 | 62,70 | 64,00 | 65,30 |
| 1500 m, s | 277,0 | 276,0 | 275,0 | 274,0 | 273,0 | 272,0 |

which provides him with many years of leadership in this discipline in our country, confidently entering the elite of the world decathlon for ten years. The most powerful types of decathlon for this athlete include those that are based on speed-strength qualities and technical readiness, namely, 100 m run, long jump, hurdles and pole vault. There is some lag behind the model in the development of general and speed endurance, as indicated by the results in both the 1500 m run and the 400 m run (Fig. 1).

Masters of Sports of International Class M-ko A. 8077 points. An athlete with a pronounced emphasis on the first six types of all-around, the basis for success in which is the athlete's excellent speed qualities (above the model results in the 100 and 400 m running), as well as parallel specialization in hurdles, where the athlete is also among the elite of Russian athletes this distance. The long jump is largely determined by speed qualities; the athlete's performance here is also higher than that of the model. However, the last types (except for the pole vault) and, above all, long throwing are relatively weak types of the athlete due to technical errors. The results in these events are below the model characteristics, and the 1500-meter run is added to them, which indicates an insufficient level of development of aerobic and anaerobic endurance (Fig. 2).

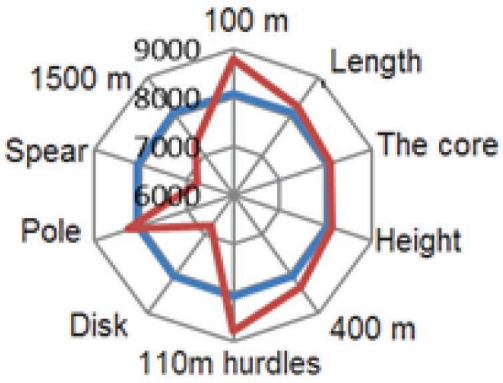


*Figure 2. Indicators of competitive activity of MSIC M-ko A. in certain types of all-around relative to the average statistical model for a result of 8077 points. in the decathlon*

Master of Sports K-ov A. 7829 points. The athlete's relatively lagging types of decathlon are long throws, here the young athlete has a significant growth reserve, as well as 1500 m running, which indicates an insufficient level of general and special endurance. An athlete with a pronounced emphasis on the types of the first day of the decathlon, the basis for success in which is a high level of development of speed and speed-strength abilities, which is manifested in all-around jumping events and sprint running (Fig. 3).

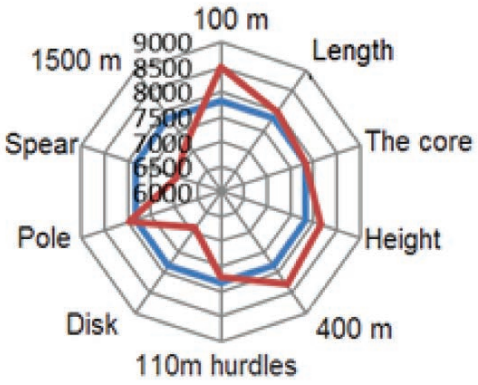


*Figure 3. Indicators of competitive activity of MS K-va A. in certain types of all-around relative to the average statistical model for a result of 7829 points. in the decathlon*

At the second stage, after analyzing the indicators of competitive activity in certain types of all-around, the correlation of results in the types, identifying the lagging types that limit performance in the decathlon, as well as the dominant types of the athlete, the strategy and tactics of preparation for the next annual cycle are determined. Based on the comparative analysis, conclusions are drawn and individual recommendations are developed for each multi-athlete to improve the training process for the next stage of preparation. The preparation management process goes through the following stages:

1. Analysis of the correlation of results in individual all-around disciplines relative to the model - identifying lagging and strong events.

2. Analysis of indicators of competitive activity in certain types using video analysis (in running events - timing of running along sections of the distance, in technical events - the number of successful attempts, stability of results in attempts, inaccessibility to the bar in long jumps). Analysis of the strengths and lagging aspects of competitive activity.

3. Using video analysis and photodiode timing, an analysis of kinematic characteristics in technical all-around events is carried out (phase composition of a competitive exercise, spatial, temporal, spatio-temporal indicators of the technical readiness of all-around athletes in individual phases of jumping and throwing).

4. Identification of technical errors in technical events, lagging aspects of athletes' special physical preparedness that limit performance in all-around disciplines. Formation of strategy and tactics for step-by-step work to improve all-around disciplines.

5. Adjustment of preparation, planning of the training process for the next stage of preparation (distribution of training means, their volume and intensity).

**Conclusions.** Based on the analysis of indicators of competitive activity in certain types of decathlon of the world's leading athletes, a model of competitive activity of qualified male all-around athletes has been formed. The model of competitive activity allows:

- compare the athlete's results in individual events with the average statistical indicators for a given result in the decathlon;

- analyze the results of a decathlete in individual events, highlight the lagging and dominant types of decathlon for a given athlete;

- plan results in individual types of decathlon for the next macrocycle of training and, on this basis, program the training process for the upcoming annual cycle.

An analysis of the competitive activity in certain types of decathlon of the leading all-around medalists of the 2022 Russian Championship in Athletics All-Around is presented. Lagging and strong types of athletes are identified, limiting factors that hinder the growth of decathletes' skills are identified, and promising areas of training are identified.

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# «Queen of sports» On the way to the XXXIII olympic games in paris

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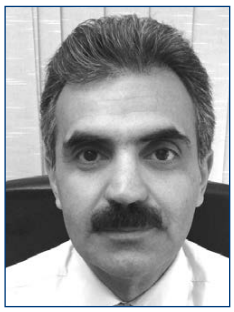

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**Abstract**

**Objective of the study** was to analyze the performances of the strongest athletes and sports teams following the results of the 2022 and 2023 World Championships.

**Methods and structure of the study.** The competitive activity of athletes who competed at the 2022 and 2023 World Athletics Championships was analyzed. The results of the unofficial team competition are considered.

**Results and conclusions.** The American team achieved the most victories at world championships - 15 out of 19 possible. The Jamaican national team has lost ground, first of all, we are talking about its male part. Two African teams - Kenyan and Ethiopian - are leaders in middle- and long-distance running and the marathon. As for the teams from Europe, it will be difficult for them to fight for a place in the top five at the Games. As the trend of development of the "queen of sports" in the world shows, track and field athletes (men and women) for the most part "overstepped" the sports results of those who actively trained and performed in the twentieth century.

***Keywords:*** *IAAF, RusAF (Russian Athletics Federation), Olympic Games, World Championships, groups of athletics events, confederation-associations, medals, countries, Russian athletics.*

**Introduction.** The global sports community has been living according to a non-standard pattern for the second Olympic cycle. A similar phenomenon in sports has arisen for objective reasons since 2019.

In the shortened current Olympic cycle (2022-2024), the main starts for track and field athletes were two world championships - 2022 (Eugene, USA; moved from 2021 to 2022) and 2023 (Budapest, Hungary; held according to original terms). The World Championships (in stadium conditions), which have been held in athletics since the summer of 1983, have become those starts that make it possible to evaluate the level of sportsmanship of national teams of countries and, in particular, of each individual athlete.

More than 1,705 athletes from 179 countries took part in the competition in the United States (214 countries are members of World Athletics), and in Hungary, according to World Athletics regulations, about 1,800 places were allocated for competition participants. In fact, a record number of athletes took to the start – 2,100 from 195 countries (+ a team of refugee athletes).

For the first time in their history, the USA and Hungary hosted world championships held in stadium conditions (previously, these countries only hosted indoor world championships).

**Objective of the study** was to analyze the performances of the strongest athletes and sports teams following the results of the 2022 and 2023 World Championships.

**Methods and structure of the study.** The competitive activity of athletes who competed at the 2022 and 2023 World Athletics Championships was analyzed. The results of the unofficial team competition are considered.

**Results of the study and discussion.** In each of the world championships under consideration, 49 sets of medals were played - 24 each for men and women and in the mixed 4x400 m relay, where two men and two women start at the start team (included in the world championship for the first time in 2019). Based on the results of the Eugene and Budapest World Championships, the balance of power in the international athletics arena a year before the Olympic Games is as follows.

The success of US track and field athletes at the World Championships (including the Olympic Games) has not been in doubt for a long time. Of the 19 world championships, the American team won in the unofficial team competition in 15 (the GDR won two victories each, the Russian Federation and Kenya won one each). The continuity of methodological, practical and other approaches to the training process that has developed over decades, both for men and women, has a positive impact on the final result. In this regard, the team does not yet see worthy competition. Compared to the 2022 World Cup, teams from Jamaica, Ethiopia, Kenya and Canada remained in the top ten. And, if these teams in Budapest lost their best positions in the table to the Canadians in terms of the number of gold medals, then in terms of the total number of medals they still became the best. It is worth adding to this that in terms of the number of points scored (the number of participants in the final stage of the competition is taken into account), the Jamaicans (139) and Kenyans (112) were second only to the Americans (277). If at the previous championship one European team made it into the top ten, this time there are five. This once again confirms the opinion that there are problems in European athletics, which performs inconsistently at major competitions. The Chinese team lost its ground significantly, remaining in Hungary with two medals (Table 1).

**Table 1.** *Ten strongest teams based on the results of the XVIII and XIX World Championships (unofficial team standings among countries that won medals; sum of all disciplines)*

| Place | Country | Men | | | | Women | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | G | S | B | ∑ | G | S | B | ∑ | G | S | B | ∑ |
| **XVIII World Championships, 2022 (Eugene, USA)** | | | | | | | | | | | | | |
| 1 | USA | 6 | 7 | 5 | **18** | 7 | 2 | 5 | **14** | 13 | 9 | 11[1] | **33** |
| 2 | Ethiopia | 1 | 2 | -- | **3** | 3 | 2 | 2 | **7** | 4 | 4 | 2 | **10** |
| 3 | Jamaica | -- | 1 | -- | **1** | 2 | 6 | 1 | **9** | 2 | 7 | 1 | **10** |
| 4 | Kenya | 1 | 2 | 1 | **4** | 1 | 3 | 2 | **6** | 2 | 5 | 3 | **10** |
| 5 | China | 1 | -- | 1 | **2** | 1 | 1 | 2 | **4** | 2 | 1 | 3 | **6** |
| 6 | Australia | -- | -- | -- | **--** | 2 | -- | 1 | **3** | 2 | -- | 1 | **3** |
| 7 | Peru | -- | -- | -- | **--** | -- | 2 | -- | **2** | 2 | -- | -- | **2** |
| 8 | Poland | 1 | 1 | -- | **2** | -- | 2 | -- | **2** | 1 | 3 | -- | **4** |
| 9 | Canada | 1 | 1 | 1 | **3** | -- | 1 | -- | **1** | 1 | 2 | 1 | **4** |
| | Japan | 1 | 2 | -- | **3** | -- | -- | 1 | **1** | | | | |
| **XIX World Championship, 2023 (Budapest, Hungary)** | | | | | | | | | | | | | |
| 1 | USA | 6 | 2 | 5 | **13** | 5 | 6 | 4 | **15** | 12[1] | 8 | 9 | **29** |
| 2 | Canada | 3 | 1 | -- | **4** | 1 | 1 | -- | **2** | 4 | 2 | -- | **6** |
| 3 | Spain | 2 | 1 | -- | **3** | 2 | -- | -- | **2** | 4 | 1 | -- | **5** |
| 4 | Jamaica | 1 | 2 | 2 | **5** | 2 | 3 | 2 | **7** | 3 | 5 | 4 | **12** |
| 5 | Kenya | -- | 2 | 2 | **4** | 3 | 1 | 2 | **6** | 3 | 3 | 4 | **10** |
| 6 | Ethiopia | -- | 1 | 2 | **3** | 2 | 3 | 1 | **6** | 2 | 4 | 3 | **9** |
| 7 | Great Britain | 1 | 1 | 3 | **5** | 1 | 1 | 2 | **4** | 2 | 3[1] | 5 | **10** |
| 8 | Netherlands | -- | -- | -- | **--** | 2 | 1 | 2 | **5** | 2 | 1 | 2 | **5** |
| 9 | Norway | 2 | 1 | 1 | **4** | -- | -- | -- | **--** | 2 | 1 | 1 | **4** |
| 10 | Sweden | 2 | 1 | -- | **3** | -- | -- | -- | **--** | 2 | 1 | -- | **3** |

Note: *12022 (USA): 4x400m mixed relay (2 men + 2 women): 1st place - Dominican Republic, 2nd place - Netherlands, 3rd place - USA. 2023 (Hungary): 4x400m mixed relay: 1st place - USA, 2nd place - Great Britain, 3rd place - Czech Republic. In Budapest, two gold medals were awarded for women in the pole vault, and therefore no one was awarded a silver medal, as well as two bronze medals for men.*

In total, representatives from 46 teams won medals in 2023, compared to 45 in 2022. At the same time, 18 versus 22 received gold awards, respectively. In recent years, fluctuations in these figures have been minimal.

Performance of the leading teams. The rightful leader of world athletics, the *US team*, has been trying for years to demonstrate an integrated approach to the development of athletics, which determines its victory at such major competitions. The complexity itself lies not only in the medals won in various types of athletics, but also in the successful performance of men and women. The bulk of medals in Budapest (up to 60%) are in sprint, hurdles and relay races. US track and field athletes try to compete successfully in jumping and throwing events and, partially, in all-around events. Against this background, the "lagging" types are: middle and long distance running, marathon running and race walking. In fact, Americans gravitate more toward speed-strength (competitive) exercises (speed-strength events rather than endurance events).

*Jamaican team*. The main competitors of US sprinters - Jamaican track and field athletes - are gradually mastering other types of athletics. As the World Championships in Budapest showed, the athletes of the island state, in addition to short-distance running - 100 and 200 m, relay distances - 4x100 and 4x400 m, successfully performed in the 400-meter run, hurdles, and long jump.

Teams of Kenya and Ethiopia. Their priority sports remain middle- and long-distance running and marathon running. It is only thanks to these distances that they have high achievements among the world athletics community. Of the 48 medals competed at the championship in Budapest in events with a predominant manifestation of endurance, both teams took about 40% of the awards with them to their homeland. The numbers for medals in Budapest, compared to Eugene, remained virtually unchanged.

For the first time in its history, the Spanish team won four gold medals at the World Championships, and all the gold was brought to the "walkers" team - men (2) and women (2). It was only thanks to their efforts that the Spanish squad became third.

Despite her popularity, the "queen of sports" is developing unevenly around the world. The unevenness lies in the fact that in some countries priority is given to certain types, in others - to a separate group of types, thirdly - there is a weak movement of athletics in general, etc. All this is directly proportional to the achievements of the confederations - associations.

The information presented in Table 2 clearly shows the extent to which the "queen" is moving in the World Athletics confederation associations.

Year after year, the most effective approach to athletics takes place in the North American Association, but only thanks to two schools - the USA and Jamaica. The lion's share of successes is associated with two countries. The same can be said in relation to the African confederation, where two countries - Kenya and Ethiopia - determine the success of the continent. In recent years, Ugandan endurance running has gradually begun to approach them. European athletics is winning medals due to greater team involvement and the development of more events overall.

It is not yet possible to single out any one team (country), since different countries compete at different championships. In 2015, the best were the British,

*Table 2. Distribution of medals by confederations - associations included in the structure of World Athletics, based on the results of the XVIII / XIX World Championships (sum of all disciplines)*

| Indicators | Confederations – Associations | | | | | |
|---|---|---|---|---|---|---|
| | Asian | African | European | Oceania | North American | South American |
| Gold medals | 5 / 3 | 9 / 9 | 10 / 16 | 2 / 1 | 19 / 20 | 4 / 1 |
| Silver medals | 5 / 2 | 12 / 8 | 12 / 15 | -- / 2 | 20 / 18 | -- / 3 |
| Bronze medals | 5 / 4 | 7 / 9 | 20 / 16 | 1 / 3 | 15 / 17 | 1 / 1 |
| Total | 15 / 9 | 28 / 26 | 42 / 47 | 3 / 6 | 54 / 55 | 5 / 5 |
| Number of countries participating in the medal standings | 7 / 7 | 7 / 6 | 19 / 18 | 1 | 8 / 9 | 3 / 5 |
| Number of countries included in the confederation-association* | 45 | 54 | 51 | 20 | 31 | 13 |

*Note: * the number of countries included in the confederation-association is indicated, according to World Athletics. In Budapest, two gold medals were awarded for women in the pole vault and, therefore, no one was awarded a silver medal, as well as two bronze medals for men. Oceania is represented by one country - Australia.*

in 2017 - the French, 2019 - the British and Germans. But for now, Great Britain can be considered the more successful team. Australia is the only member of the Oceania Association to win medals at the third championship in a row. On rare occasions, they are "helped" by one or two athletes from New Zealand. In addition, the Australian team won six medals for the first time in the history of the championships.

Russian "queen of sports". If in the last Olympic cycle (2017-2021) some of the strongest track and field athletes were given the right to participate in a number of major international competitions (the athletes were "endowed" with neutral status), then in the current one, not a single athlete was given such a right was. But, despite this, on March 23, 2023, the International Athletics Association decided to restore the full status of RusAF within its ranks. Thus, after seven years and five months, against the backdrop of fulfilling all legal and illegal requirements, track and field athletes of the Russian Federation could plan performances at international competitions in their calendar. As subsequent events showed, the permission was of a formal nature, and de jure World Athletics "put its decision on hold" (on the day the RusAF reinstated).

Conclusions. For the first time in the history of the World Championships, the team that won the unofficial team event won more medals - 33 - than the others. Prior to this, a kind of record belonged to the track and field athletes of the German Democratic Republic - 31 awards (1987).

The American team achieved the most victories at world championships - 15 out of 19 possible. US athletes (men and women) mostly win medals of various denominations in sprinting and hurdles, relay running, and partly in throwing and jumping events. In running, which primarily involves endurance, the Americans' chances of winning medals remain slim. The Jamaican national team has lost ground, first of all, we are talking about its male part. The lion's share of medals came from the island nation's women's team, which currently remains competitive in sprint and relay events. Two African teams - Kenyan and Ethiopian - are leaders in middle- and long-distance running and the marathon. As for the teams from Europe, it will be difficult for them to fight for a place in the top five at the Games.

In total, medal winners are usually representatives of 45-46 countries. The largest number of medals remains with representatives of the North American association, where the vast majority of medals are in the sprint, hurdle and relay groups. The predictability of the results of the team wrestling at the Olympics in France is obvious. Undoubtedly, American athletes will win the fight for championship. Their hypothetical "competition" could be teams from Kenya, Ethiopia and Jamaica.

Previously, World Athletics took issue with the cancellation of the record achievements of track and field athletes who competed in the 20th century, complaining that they used "various tricks" in their preparation. But, as the development trend of the "queen of sports" in the world shows, track and field athletes (men and women) for the most part "overstepped" the sports results of those who actively trained and performed in the twentieth century.

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# Early motor rehabilitation of children with autism

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***Keywords:*** children with autism spectrum disorder, motor rehabilitation, means of adaptive physical culture (AFC).

**The purpose of the study** – to identify the prerequisites and means of early motor rehabilitation of children with autism.

**Methodology and organization of the study.** A sociological survey of parents on the effectiveness of motor activity of children with autism was conducted. The opinion and attitude of specialists towards early onset have been studied and popular means of physical rehabilitation have been identified.

**Research results and conclusions.** Early initiation of motor rehabilitation is a necessary and effective tool to help children with autism develop motor and social skills, improve functional qualities and life competencies.

**Introduction.** The worldwide increase in the number of children with autism is a challenge for society and specialists in various industries, including the field of AFC. Early intensive initiation of habilitation and motor rehabilitation contributes to the development of necessary skills and correction of functional disorders, the severity of which varies and depends on each individual case [1].

The purpose of the study: to identify the prerequisites and means of early motor rehabilitation of children with autism.

**Methodology and organization of the study.** 94 parents of children with autism were interviewed, who expressed different opinions on the need for motor rehabilitation. Less than half of 40.4% (38 people) are convinced of the relevance of regular physical education and sports activities that cause positive changes in children's behavior, communication and social skills. Among the skeptics who doubt the effectiveness of sports, there were 28 people (27.7%). They prefer other types of therapy, which, in their opinion, have a stronger impact on the capabilities and skills of children. A neutral opinion was expressed by the remaining group of respondents who do not know or have limited knowledge about the role of motor rehabilitation.

Based on one of the main principles of the AFC, which presupposes the early start of correctional and developmental work, we studied the opinion of specialists (n-24) on this issue. As a result of the survey, 70.8% (17 people) of respondents confidently answered about the need for such an approach, the remaining 7 specialists expressed doubt about the effectiveness of physical rehabilitation in children with autism. They noted that motor activity may not have a direct impact on social and communication skills in autistic children.

According to the respondents, children with autism can find pleasure and benefit from various sports, but the choice depends on the individual interests and capabilities of the child. Among the tools used, the most popular are: football, cycling, swimming, dance sports, yoga and non-contact taekwondo.

**Conclusions.** A variety of opinions regarding the early start of physical rehabilitation indicate the importance of conducting further research and analyzing the results in order to better understand the impact of motor activity on the psychophysical and social characteristics of children with autism.

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# Development of a didactic system for remote physical training of police employees

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***Key words:*** *police, physical training, distance learning, self-defense techniques.*

**Introduction.** Currently, distance learning is actively developing in educational organizations of the Russian Ministry of Internal Affairs system. This is due to the need to implement a correspondence form of professional training for female employees with preschool children; employees serving in the Far North; employees who previously served in state paramilitary organizations. Physical training as an academic discipline is also included in the professional training program for employees [2]. However, at present there is no educational and methodological support for physical training in the distance learning format.

**Purpose of the research** – development of a didactic system that allows organizing and conducting distance physical training for employees of internal affairs bodies in correspondence courses.

**Research methodology and organization.** The study was conducted in 2021-2023. on the basis of the Tyumen Institute for Advanced Training of Employees of the Ministry of Internal Affairs of the Russian Federation. The study used scientific methods: analysis and generalization of distance educational technologies [1]. The means and methods of developing skills in wrestling techniques and developing physical qualities were also studied.

**Results and its discussion.** In 2023, based on the results of research work, an electronic textbook "Physical training of police officers of the Russian Federation" was prepared. Users of this electronic manual have the opportunity to study combat techniques, develop physical qualities, model an independent training program, and monitor their achievements remotely, but in interactive communication with a teacher. Heads of structural units also have the opportunity to control the physical training of their subordinates. The manual was tested in the process of implementing training programs for professional training of employees of internal affairs bodies studying by correspondence. Currently, more than 80 people from more than 40 regions of our country visit the benefit website daily. The manual was reviewed at a meeting of the educational and methodological section on additional professional programs - advanced training programs, professional retraining programs at the All-Russian Institute for Advanced Training of Employees of the Ministry of Internal Affairs of the Russian Federation and recommended for use in universities of the Ministry of Internal Affairs of Russia.

**Conclusion.** The developed electronic textbook allows you to organize the educational process of distance physical training for employees of internal affairs bodies studying by correspondence. The electronic format for structuring system elements allows you to flexibly respond to changes in the general system of professional education of employees and generate various pedagogical technologies. The developed didactic system is nonlinear, open and capable of self-development.

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# Simulation of comprehensive practical lessons on firefire and physical training of police employees

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***Key words:*** *полиция, physical training, fire training, situations, modeling, complex classes, practical classes, differentiated approach, difficulty levels.*

**Introduction.** An analysis of the practice of actions of police officers in extreme situations of official activity revealed the need to possess the skills of complex actions of using firearms, protecting against blows, releasing from various seizures and detaining offenders. In this connection, there was a need to find effective ways to train police officers in the complex use of physical force and firearms [1, 2].

**Purpose of the research** – development of a unified model of a comprehensive practical lesson aimed at training police officers in the complex use of physical force and firearms.

**Research methodology and organization.** The study was conducted in 2023 on the basis of the Tyumen Institute for Advanced Training of Ministry of Internal Affairs employees. The study used scientific methods: analysis and generalization of situations of the use of service weapons and physical force, modeling; pedagogical experiment, testing. At the end of the training period, employees from the EG and CG were tested for their skills in the complex use of physical force and firearms in typical work situations.

**Results and its discussion.** As a result of the study, a unified model of a comprehensive practical lesson was developed aimed at training police officers in the complex use of physical force and firearms. The developed model is based on an algorithm for the activities of students and teachers. The main elements of the model are: formulation of goals and tasks for students; distribution of tasks and roles between students; development of an algorithm of actions for student employees in accordance with options for changing the behavior of assistants - offenders; procedural part of the lesson; reflection. Simulation of complex practical exercises was used in the physical training of employees of the experimental training group studying under professional training programs for persons in the position of "Policeman". At the final lesson, students of the experimental group demonstrated a higher level of preparedness for action in situations of complex use of combat techniques and service weapons (24.2% more than in the control group).

**Conclusion.** Результаты исследования выявили эффективность моделирования комплексных практических занятий, направленных на обучение сотрудников полиции комплексному применению физической силы и огнестрельного оружия.

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# Training police employees in self-defense techniques using a special stick

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***Key words:*** *police, physical training, self-defense techniques, special stick.*

**Introduction.** Police officers are often faced with situations of attack by criminals armed with a knife or some other heavy object. In these situations, a police officer has the right to use various special means for protection, including a special stick [2]. However, in the Manual on the organization of physical training in the internal affairs bodies of the Russian Federation, only the basic technique of striking and defending with a special stick without disarming and arresting techniques is presented for study [1]. It is necessary to develop a set of self-defense techniques with a special stick, aimed at training employees in effective methods of disarming when protecting themselves from blows with a knife or a heavy object, followed by detaining the criminal.

**Purpose of the research** – identifying effective ways to use a special stick to protect against blows from a criminal armed with a knife or heavy object, with the possibility of disarming and detaining him.

**Research methodology and organization.** The study was conducted in 2023 on the basis of the Tyumen Institute for Advanced Training of Employees of the Ministry of Internal Affairs of the Russian Federation. The study used scientific methods: analysis and generalization of self-defense techniques using a special stick; modeling typical situations of using a special stick; pedagogical experiment, testing. Students in the experimental group studied techniques for using a special stick to protect against blows from a knife or a heavy object, and to free themselves from certain types of grips and grips.

**Results and its discussion.** As a result of the study, effective techniques were identified for using a special stick to protect against blows from above, below, from the side with a knife or a heavy object with the possibility of disarming and detaining a criminal. Techniques were also identified for using a special stick to free oneself from grips by the hand, and clasping the torso from the front and back. The developed set of techniques was tested in the physical training of police officers studying under the professional training program for the position of “Policeman”. At the end of the training period, it was revealed that the vast majority of representatives of the experimental group were able to perform self-defense techniques using a special stick compared to the control group.

**Conclusion.** The results of the study revealed the effectiveness of using a special stick not only for blocking a blow and striking back, but also for disarming a criminal and detaining him. Skillful use of a special stick in hand-to-hand combat techniques is one of the criteria for the professional preparedness of police officers.

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# Technology of integration of physical culture and sports activities and patriotic education of students

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**The purpose of the research** is to develop and test innovative forms of organization and development of physical culture and sports work with students at the university.

**Methodology and organization of the study.** The New Zarnitsa sports and patriotic program has been developed based on the technology of integrating physical culture and sports activities and patriotic education.

**The results of the study and conclusions.** The introduction and implementation of the Program's activities makes it possible to increase the effectiveness of the educational process of physical education universities, which is confirmed by the data of a sociological survey of teachers, coaches and students.

***Keywords:*** *technology, integration, physical culture and sports activities (FSD), patriotic education, student youth.*

**Introduction.** Modern socio-political challenges and strategic tasks set for their solution actualize the need to integrate physical culture and sports activities and patriotic education of Russian youth, the development and introduction of new forms of physical education, school, student and mass sports based on the implementation of research and socially oriented projects using advanced and innovative experience [1].

The purpose of the research is to develop and test innovative forms of organization and development of physical culture and sports work with students at the university.

**Methods and organization of research.** The main conceptual idea of the New Zarnitsa Program was the technology of integration of physical culture and sports activities and patriotic education, which involves creating conditions for the consistency of educational, physical culture and sports and civic-patriotic work at the university. The objectives of the technology are aimed at: attracting young people to a healthy lifestyle, engaging in military-applied sports; fostering a sense of patriotism; psychological preparation for overcoming difficulties, developing skills of action in extreme situations; development of various mass, accessible and popular forms of sports and recreation work; improvement of work on sports and patriotic education, civic formation of student youth.

**The results of the study and conclusions.** As part of the survey, experts (n-38) expressed the opinion that the integration of sports and patriotic education of students is an important element of their education and civic and personal formation (89.4%). During the implementation period, the participants of the Program improved their psychophysical preparedness (78.9%), moral qualities (92%), increased self-esteem (97.4%) and strengthened patriotic feelings (81.6%). These results confirm the importance of the task of forming civic identity and patriotism among students of physical education and sports universities, which has acquired special importance in the context of international sports isolation.

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