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EDUCATIONAL AND METHODICAL COMPLEX
IN THE ACADEMIC DISCIPLINE

MODERN CONTROL TECHNOLOGIES IN THE PRACTICE OF PHYSICAL EDUCATION AND SPORTS

for a specialty of the second stage of higher education

7-06-1012-01 Physical culture and sport (theory and methodology of physical education, sports training, health-improving and adaptive physical culture)

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M78 **Modern control technologies in the practice of physical education and sports for a specialty of the second stage of higher education7-06-1012-01 Physical culture and sport (theory and methodology of physical education, sports training, health-improving and adaptive physical culture):** educational and methodical complex in the academic discipline / compl. by: V.G. Shpak, M.S. Bulynia. – Vitebsk : VSU named after P.M. Masherov, 2024. – 63 p.
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The material presented in this publication is intended for master students of the specialty 7-06-1012-01 Physical culture and sports and will be useful when conducting lectures and practical classes in the academic discipline "Modern control technologies in the practice of physical culture and sports." The educational complex presents some informative methods for determining psychological and technical readiness when engaging in physical exercises, as well as functional tests to determine the state of the body. Recommended for practical use by teachers, master students, students, as well as coaches and physical education teachers.

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CONTENT

EXPLANATORY NOTE

The discipline “Modern technologies of control in the practice of physical culture and sports” is a component of a higher education institution of the module “General Theory and Practical Aspects of Physical Culture and Sports” of the Educational Standard of Higher Education. ESHE 7-06-1012-01, second stage (master's degree), specialty - 1-08 80 04 Physical culture and sports.

In the system of training a specialist with a higher education in physical education, the academic discipline “Modern technologies of control in the practice of physical culture and sports” contributes to the formation of the following competencies: SC-6 - to develop comprehensive health and correctional programs for various groups of the population.

Mastering the academic discipline is carried out in the process of lectures and practical classes. The lecture course is given in accordance with the main topics of the academic discipline, defined by the curriculum.

Practical classes are focused on mastering practical skills in testing the physical qualities and technical readiness of athletes and skills in solving problems in the field of statistical processing of the obtained measurement results, on solving problems related to complex control (determining the information content, reliability of tests; assessing test results using scales of various types; calculation indicators of physical and technical readiness). Studying the discipline involves the use of business games, statistical processing of measurement results using applied computer programs, and computer testing.

As a result of studying the discipline, the graduate must

know:

- basic concepts and methods of measurements;
- methods of statistical processing of measurement results;
- methods of testing motor qualities and assessing test results;
- basic provisions of the theory of control in physical education and sports;

be able to:

- carry out test measurements;
- carry out statistical processing of measurement results;
- evaluate the reliability of statistical characteristics.

THEORETICAL SECTION

Lecture 1. Control in physical culture and sports

Plan:

1. The meaning and types of control in physical culture and sports.
2. Control of training and competitive loads of athletes.
3. Monitoring physical fitness during physical education and sports.
4. General characteristics of functional tests used in physical culture and sports: indications for conducting functional tests; requirements for functional tests; absolute contraindications; testing of athletes; types of influences used during testing.
5. Psychodiagnostics of personality during physical education and sports: ethical aspects of psychodiagnostics, classification of diagnostic techniques.

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1. Zheleznyak, Y.D. Fundamentals of scientific and methodical activity in physical culture and sport: textbook for students. Universities, studying on specialty "Physical Culture" / Y.D. Zheleznyak, P.K. Petrov. - Moscow: Academy, 2009. - 267 p.
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1. The meaning and types of control in physical culture and sports

Control is aimed at collecting, evaluating and analyzing the necessary information about the actual progress of the training process and the athlete's condition. It covers all aspects of the preparation process and allows you to manage it in a targeted manner.

Planning and control are inseparable from each other. In order to obtain reliable and reliable information in sports practice, various control methods are used: collecting the opinions of athletes and coaches; analysis of working documentation of the training process; pedagogical observations during training and competitions; determination and registration of indicators characterizing the activities of athletes during training sessions (timing, pulsometry, dynamometry, video recording, etc.); tests (control tests) of various aspects of athletes' preparedness; methodological and biological measurements, etc.

Control in the training of athletes should include, first of all, assessment of: training and competitive loads, since they are the main factor influencing the development of sports performance; the condition of the athletes, their preparedness (physical, technical, etc.); sports results of young athletes and their behavior in competitions.

2. Control of training and competitive loads of athletes

When talking about the training load, it should be borne in mind that this concept is understood as the additional functional activity of the body (relative to the level of rest or another initial level) introduced by performing training exercises, and the degree of difficulties overcome in this case (L.P. Matveev).

Load control involves assessing the following characteristics (M.A. Godik):

1. Specialization of the load, i.e. measures of the similarity of a given training tool with a competitive exercise and, on the basis of this, the distribution of all means into

specialized and non-specialized, determining their ratio for a certain period of time (year, stage, month, week and one lesson).

2. Determination of the coordination complexity of the load. To do this, it is necessary to identify the characteristics on the basis of which all training means will be divided into simple and complex. Such signs include the speed and amplitude of movements, the presence or absence of active confrontation, lack of time, sudden change in the situation, etc.

3. Load orientation, based on the predominant impact of the exercise used and its components on the development of a particular quality or functional system of the body. Based on their focus, the following groups of loads are distinguished (N.I. Volkov): anaerobic adactate (speed-strength), anaerobic, glycolytic (speed) endurance, aerobic-anaerobic (all types of motor qualities), aerobic (general endurance), anabolic (strength and strength endurance).

4. The magnitude of the load, namely the determination of absolute or relative indicators of the volume and intensity of the external (physical) or internal (physiological) side of the load. In some cases, combined load indicators, which are defined as the product (or ratio) of physical and physiological load parameters, turn out to be informative.

Naturally, the indicators used to control loads will vary depending on the sport.

3. Monitoring physical fitness during physical education and sports

Physical fitness monitoring includes measuring the level of development of strength, speed, endurance, flexibility, agility and related abilities. The main control method in this case is the method of control exercises (tests). When choosing tests, the following conditions must be met: determine the purpose of testing; ensure standardization of measurement procedures; use tests with high values of reliability and awareness; use tests, the technique of which is relatively simple and does not have a significant impact on the test results - tests should be so mastered that when performing them, all attention is directed to achieving the maximum result; have maximum motivation to achieve maximum results in tests; have a system for assessing achievements in tests.

The degree of development of motor qualities is determined using two groups of tests. The first group, which includes nonspecific tests, is intended to assess general physical fitness, and the second group includes specific tests and is used to assess specific physical fitness. It should be noted that the choice of tests for assessing physical fitness largely depends on the types of sports, age, qualifications of athletes, and the structure of the annual and multi-year cycle of sports training.

4. General characteristics of functional tests used in physical culture and sports: indications for conducting functional tests; requirements for functional tests; absolute contraindications; testing of athletes; types of influences used during testing

Functional tests are various dosed loads and disturbing influences that allow one to obtain objective data on the functional state of the physiological systems of the body.

When conducting simultaneous tests, a single physical load is performed. The differences between them are related to the type, duration and intensity of the load.

Two-stage tests involve performing a repeated load of the same or, less often, different directions with a short rest interval, during which the reaction to the first load is determined.

Three-moment (combined) tests are based on determining the adaptation of the circulatory system to loads of varying nature

Simultaneous tests are used for mass examinations of people involved in physical education in groups of general physical training and in health groups, as well as people embarking on the path of sports improvement, to quickly obtain indicative information about the functional state of the circulatory system. They are also convenient for use when conducting medical and pedagogical observations. More significant changes in the function of the cardiovascular system are caused by two-stage tests, but their value is reduced by the same

nature of repeated loads. This disadvantage is compensated by the combined three-moment Letunov test.

*Indications for functional tests***:**

1) determination of a person's physical preparedness for physical education and sports, physical therapy;
2) examination of professional suitability;
3) assessment of the functional state of the cardiovascular, respiratory, nervous and other systems of healthy and sick people;
4) evaluating the effectiveness of rehabilitation and training programs;
5) predicting the likelihood of occurrence of certain deviations in health status during physical education.

Requirements for functional tests:

1) the load must be specific to the person training;
2) the test should be carried out with the maximum intensity possible for a given subject;
3) the sample must be standard and easily reproducible;
4) the sample must be equivalent to the load under living conditions;
5) the sample must be harmless.

When testing the physical fitness of middle-aged and older people involved in recreational physical education and having chronic diseases of the cardiovascular system, care must be taken.

Absolute contraindications:

1) severe circulatory failure;
2) rapidly progressing or unstable angina;
3) acute stage of myocardial infarction;
4) active myocarditis;
5) recent embolism;
6) vascular aneurysm;
7) acute infectious disease;
8) thrombophlebitis;
9) ventricular tachycardia and other dangerous rhythm disturbances;
10) pronounced aortic stenosis;
11) hypertensive crisis;
12) severe respiratory failure;
13) impossibility of performing the test (diseases of the joints, nervous and neuromuscular systems that interfere with the test).

Testing of athletes. To ensure reliable results, on the basis of which the physical performance and preparedness of an athlete can be reasonably assessed, it is necessary to fulfill a number of requirements for the testing procedure:

1. Ensuring a normal microclimate in the testing room. The room should be well ventilated, the temperature in it should be maintained at a comfortable temperature level. A minimum of medical personnel should participate in testing. It is necessary to exclude the occurrence of sound, light and other signals not related to the study. The equipment used for testing must be clean and well grounded in accordance with generally accepted rules.

2. When performing work of extreme intensity or duration, motivation is an important point. Thus, when offering an athlete a load in the form of a 15-second run in place at maximum pace, one can never be sure that the load is actually being performed at maximum intensity. It depends on the athlete's desire to develop his maximum intensity, his mood and other motivational factors. The minimal influence of side effects is proven by good reproducibility of the results.

3. Before testing begins, the subject must be given detailed instructions about his behavior during the test. Otherwise, test results may be largely determined by the athlete's emotional reactions.

Types of influences used during testing:

a) physical activity:

1. dynamic
2. static
3. mixed (dynamic and static loads)
4. combined (physical activity and other type of influence, for example, pharmacological).

b) change in body position in space;

Orthostatic (transition from a lying position to a standing position) and clinostatic tests.

v) straining;

This procedure is performed in two versions. In the first, straining is not quantitatively assessed (Valsalva maneuver). The second option involves dosed straining. It is carried out using pressure gauges into which the subject exhales. The pressure gauge readings practically correspond to the intrathoracic pressure value. Tests using dosed straining include the Buerger test and Fleck test.

g) changes in the gas composition of inhaled air;

Changing the gas composition of the inhaled air in sports medicine practice most often consists of reducing the oxygen tension in the inhaled air. Hypoxemic tests in sports medicine are most often used to study resistance to hypoxia, which can be observed during competitions and training sessions in mid-altitude and high altitudes.

d) medications.

The administration of medicinal substances as a functional test is used, as a rule, for the purpose of differential diagnosis between normal and pathological conditions.

When carrying out all tests, it is possible to study changes in the function indicators of various organs and systems and, based on these changes, to evaluate the body's response to a given effect. Registration of output signals is carried out differentially, depending on which system of the body provides the most objective assessment of the reaction to a particular type of input influence. As a rule, these are the nervous, cardiovascular and respiratory systems. The most informative physiological values, the registration of which presents the least difficulties (heart rate, respiratory rate, blood pressure), are usually used as output indicators. Most often, these are indicators of the cardiovascular system, which quickly responds to a wide variety of influences.

Changes in heart rate and blood pressure should be adequate to physical activity, i.e. the smaller the amount of work done, the lower the absolute values of hemodynamic parameters should be.

The speed of recovery depends on the power and type of physical activity and characterizes the level of fitness. Low power loads (single-stage tests) determine recovery primarily due to the vegetative circuit. For exercise lasting more than 3 minutes, recovery is determined by metabolic capacity.

5. Psychodiagnostics of personality during physical education and sports: ethical aspects of psychodiagnostics, classification of diagnostic techniques

Ethical aspects of psychodiagnostics

The following principles of psychodiagnostics are identified (R.S. Nemov, 1995).

*The principle of secrecy*provides for non-disclosure of psychodiagnostic results without the consent of the person being diagnosed. When conducting psychodiagnostics for scientific purposes, this is not necessary. However, publications should not indicate the specific names of the subjects.

Principle of scientific validity psychodiagnostic methods stipulate that they must be valid and reliable.

The principle of no harm suggests that the results of psychodiagnostics should not be used to harm a person.

The principle of objectivity of conclusions from the results of psychodiagnostics assumes that the conclusions are scientifically substantiated, follow from the results of psychodiagnostics, and do not depend on the subjective attitudes of the psychologist.

Principle of effectiveness of prospective recommendations provides that recommendations given to a person, for example recommendations for a person to engage in a particular sport, must be useful.

For a researcher conducting psychodiagnostics, it is important to know the theory on which a particular testing method is based. Otherwise, the researcher may make serious mistakes when analyzing the results of psychodiagnostics and making recommendations.

When conducting psychodiagnostics, it is necessary to comply with moral and ethical standards (R.S. Nemov, 1995):

1. You cannot subject a person to psychological examination without his consent.
2. The test taker has the right to know the results of psychodiagnostics. The test results are presented to the subject in a form that is understandable to him.
3. When testing minor children, their parents have the right to know the results.
4. When testing in competitive selection or when applying for a job, a person has the right to know the purpose of testing and possible conclusions based on its results.

Classification of diagnostic techniques

There are various classifications of psychodiagnostic techniques. It all depends on what characteristic is taken when classifying methods.

R. S. Nemov (1995) offers the following classification:

1. Methods of psychodiagnostics based on observation.
2. Questionnaire psychodiagnostic methods.
3. Objective psychodiagnostic methods.
4. Experimental methods of psychodiagnostics.

For a more detailed classification of psychodiagnostic techniques, it is necessary to highlight the criteria by which the techniques are classified. Such criteria are the type of test tasks; recipient of the material used in the methodology; test presentation form; the nature of the data used to draw conclusions about the results of psychodiagnostics; the presence of test standards in the methodology; internal structure of the technique.

By type of test tasks used techniques are divided into:

-surveys (questions are used);

-affirmative (judgments and statements are used);

-productive (one or another type of the respondent's own creative activity is used);

-effective (performing practical actions);

– physiological (involuntary physical or physiological reactions of the body are analyzed).

To the recipient of the test material techniques are divided into conscious, appealing to a person's consciousness (questionnaire) and unconscious, studying unconscious human reactions (projective techniques).

According to the form of presentation of the test material methods are divided into blank (written, drawing, schematic versions), technical, presenting the material in audio, video form, etc. and sensory, representing physical stimuli to the senses.

By the nature of the data techniques are divided into:

– objective, independent of the consciousness and desires of the subject (analysis of physiological indicators);

– subjective, depending on the desire and consciousness of the subject and the experimenter (questionnaire).

According to the availability of test standards Methods are divided into those that have similar norms and those that do not.

By internal structure techniques are divided into:

- multidimensional (a complex of qualities is studied - the Cattell questionnaire);
- monomeric (one particular quality is diagnosed.

A separate group includes methods based on qualitative and quantitative analysis of experimental data.

Let's consider the classification of psychodiagnostic methods presented by M.K. Akimova (2008).

All psychodiagnostic methods are divided into two large groups: formalized and less formalized methods.

Formalized methods include tests, questionnaires, projective methods, and psychophysiological methods.

This group of techniques is characterized by:

- regulation;
- objectification of the psychodiagnostic procedure (exact adherence to instructions, methods of presenting stimulus material, non-interference of the researcher);
- standardization (establishing uniformity in the processing and presentation of psychodiagnostic results);
- reliability;
- validity.

The collected results using these techniques make it possible to quickly compare and group the subjects among themselves.

Less formalized techniques: observation; conversation; analysis of activity products.

These techniques make it possible to collect data on mental phenomena that are difficult to objectify (poorly realized experiences, personal meanings, goals, states, mood, etc.). Using the methods of this group presents difficulties for the experimenter in collecting information and processing it. Thus, a single observation will not provide objective information. A conversation in an inadequate state of the subject may also not give objective results. Slightly formalized techniques, as a rule, are an addition to formalized techniques and are used mainly before carrying out formalized techniques.

Lecture 2. Basics of monitoring the technical and tactical readiness of athletes

Plan:

1. Control of technical readiness.
2. Control of equipment volume.
3. Control of the versatility of technology.
4. Monitoring the effectiveness of equipment.
5. Control of technology mastery.
6. Monitoring the tactical readiness of athletes.
7. Control of tactical thinking.
8. Control of tactical actions.

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1. Control of technical readiness

Control of technical readiness, or technical mastery (TM), consists of assessing what an athlete can do and how he performs mastered movements. There are two main methods of monitoring TM: visual and instrumental.

Visual control is the most common, one of the main ones in sports games, martial arts, gymnastics, figure skating and some other sports. It is necessary to draw up an observation program and train observers. For example, before measuring the TM of football players by the number and accuracy of short, medium and long passes, it is necessary to first agree on their classification. When assessing the accuracy of a pass, you need to take into account the degree of mutual understanding between the players. Visual control of TM can be carried out both during direct observations of the athlete's actions, and with the help of video equipment. The second method allows you to: 1) document the athlete's movements (and if there are several video cameras, from different points); 2) with systematic recording, have a video library of the athlete's movements and analyze his TM in dynamics; 3) use a freeze frame, as well as play back recorded movements in slow motion, which increases the reliability of their analysis; 4) eliminate the influence of the competitive situation on the results of observations. Even an experienced expert, observing an athlete at competitions, may make mistakes in assessing his movements (actions) due to emotional excitement, enthusiasm for some moment, etc.

Instrumental control of TM is intended to measure the biomechanical characteristics of movement techniques. The time, speed and acceleration of the movement as a whole or its individual phases, the efforts developed when performing movements, the position of the body or its segments are subject to registration. The choice of each of the registered indicators is determined by the measure of their information content. In the practice of modern sports, in most cases, the registration of technical indicators and their analysis are separated by a time interval (sometimes very significant).

There is an indirect assessment of TM using instrumental methods, when physiological and biochemical parameters are measured. In this case, for example, lower oxygen consumption in one of several athletes performing an exercise of the same intensity will indicate a more effective technique. An athlete can compare his sensation of movement with an objective assessment of his technique and, based on such a comparison, make the necessary corrections in the training process. Registration of biomechanical characteristics of movements is the beginning of assessing the effectiveness of sports equipment. Significant measurement errors at this stage cannot be eliminated by any subsequent operations; as a result, the final judgment about the athlete's TM will be erroneous. Thus, the accuracy of assessing an athlete's TM depends primarily on the accuracy of measuring the biomechanical characteristics of movements. For example, video recording will be useful if you shoot at a frequency of 100 or more frames per second while meeting all metrological requirements.

2. Control of equipment volume

The volume of technique is determined by the total number of actions that an athlete performs during training sessions and competitions. They control it by counting all these actions. When each of the activities is clearly defined, registration errors are minimal. For example, when recording techniques at a football match, three observers obtained the

following final results: 765, 765 and 769 actions. The error, as we see, is less than 1%. The information content of technical volume indicators is not the same in different sports. The competitive volume of technique is variable and depends on the qualifications of the opponent, the tactics of the match, etc., for example, athletes of the same football team can perform from 400 to 1000 techniques in a game, and the results of the matches will not be interrelated with the volume of actions. In cyclic sports (running, swimming, rowing), indicators of the volume of technique are not informative. The training volume of technical techniques indicates the potential capabilities of athletes, and the ratio of the competitive volume to the training volume indicates their implementation.

3. Control of the versatility of technology

The versatility of an athlete's technical preparedness is determined by the degree of variety of motor actions that the athlete masters. Training versatility is usually higher than competitive versatility. This is due to the fact that in important meetings with opponents of equal class, the athlete uses a limited number (sometimes one or two) techniques. In sports games, an informative indicator of versatility is the ratio of the frequency of use of different playing techniques, for example, the ratio of the number of passes to the number of shots on goal in football. A particular criterion for the versatility of a technique is the ratio of techniques performed on the right and left sides. The choice of one side when performing movements is called lateral preference. The lateral preference coefficient is equal to the ratio of the number of techniques performed in the dominant (favorite) side to the total number of techniques. For most athletes it is 0.80-1.00, and only for some high-class wrestlers its value decreases to 0.60. The reliability of versatility indicators is low and depends on many factors (rank of competition, tactical and technical skill of the opponent, etc.).

4. Control of the effectiveness of equipment

The effectiveness of a sports movement technique is determined by the degree of its proximity to the individually optimal option. In principle, the most effective movement technique should be the one that best realizes the athlete's motor potential. The degree of implementation depends on many factors, including such as motivation, tactical and physical preparedness, etc. It is assumed that an effective technique ensures the achievement of the maximum possible result within a given movement. Consequently, sports results are an important, but not the only criterion for the effectiveness of a technique. No less informative are other criteria that characterize the absolute, comparative and implementation effectiveness of technology.

Determination of the absolute effectiveness of technology. To do this, first, the indicators of the technique of the movement under study are recorded, and then their values are compared with reference values selected on the basis of biomechanical, physiological, psychological and aesthetic criteria.

It has been established, for example, that it is biomechanically expedient to move a boat along a distance in a straight line and with slight fluctuations in speed (except for the starting and finishing segments). Such movement is ensured by effective technique, and primarily by such a criterion as stroke force impulses: they must be the same for the right and left oars. In the case of asymmetry in the strength readiness of the rower, certain differences in the time indicators of the technique are possible. Not only the impulse of force, but also time can be a criterion for the absolute efficiency of the technique: the smaller the difference in the duration of the wiring and carrying of the right and left oars, the higher the speed of the boat. In skiing, speed skating, swimming, and rowing, the absolute effectiveness of a technique can be assessed by the distance covered per stroke (step). Insufficiently efficient running technique leads to higher (8%) oxygen consumption. When analyzing the absolute effectiveness of technology in sports games, it is recommended to use the so-called priority approach. It is as

follows. It is known what biomechanically effective shots on the ball should be in volleyball, football, and tennis. But in a number of game situations these strikes must be performed covertly and suddenly. However, it is not always possible to do them biomechanically correctly. In this case, when assessing effectiveness, you need to focus not on biomechanical or physiological criteria, but on tactical and mental ones. If an athlete solves the game problem of a given situation, it means that the technique performed by him is effective.

Determination of the comparative effectiveness of technology. This assessment method is based on comparing the athlete's movement technique with the technique of a similar movement performed by a highly qualified athlete. Since the technique of the latter is quite individual, it is advisable to choose as a model an outstanding athlete who is close in physical and mental fitness to the one being compared. Most often, however, the average technique of a group of highly qualified athletes is used as a model. The comparison procedure in this case is aimed at searching for discriminatory indicators of technique (i.e. those whose values are different for athletes of different qualifications). To do this, biomechanical indicators of the exercise technique are recorded, and then a comparative analysis is carried out.

The specificity of determining the comparative effectiveness of technology in games and martial arts lies, firstly, in the insufficient metrological validity of its criteria. In these sports, the technique that is effective is the one that leads to a practically useful result.

But the fact is that there is no single result. In one case it is a dribble by the opponent, in another it is a perfectly executed pass, in the third it is a scored goal, etc. Secondly, the values of performance criteria that are used in practice are very variable. For example, the number of accurate passes in a match can range from 60 to 100%. Therefore, it is necessary to compare performance indicators recorded in a series of games or fights, while comparing both arithmetic averages and standard deviations.

In martial arts and team sports, it is impossible to compare the performance indicators of the technique of athletes performing in competitions of different qualification levels, in different leagues, etc. For example, the efficiency coefficients of technical techniques of football players playing in the major league and in the second may be the same, but this does not mean that they perform all techniques equally well. When teams from the second league play among themselves, the effectiveness of technical and tactical actions can be quite high. If such a team meets with a team from the major leagues, then the performance indicators of its playing technique will sharply decrease.

Determining the implementation effectiveness of a technique Methods for assessing the effectiveness of a technique based on the implementation of motor potential (MP) consist of comparing the result shown in a competitive exercise with the achievement that the athlete could show if he had an excellent (effective) movement technique. The technique of this approach consists in calculating the proper result in the exercise (corresponding to the athlete's motor capabilities) and comparing it with the one shown. The greater the difference, the less effective the technique.

An important point is the assessment of motor potential based on a set of the most informative physical qualities. In a simplified version, DP can be represented by one indicator (for high jumpers - the relative strength of the plantar flexors of the foot, for middle-distance runners - maximum oxygen consumption, for swimmers - strength in swimming "tethered", etc.). For a group of athletes, the results in the exercise, the technique of which they want to evaluate, and the results in the test (DP) are measured. Based on these data, a regression equation is drawn up: $y = kx + b$, where y is the expected result in the exercise; x - DP, k and b - coefficients.

Consider the following example. The results of the 1500 m run (y) and VO2 max (x) were measured for a group of runners. We calculated the regression equation $y = 3.17x + 14.65$. Substituting the MPC value of any of the runners in the group into this equation instead of x, we get the proper result for each of them. For example, an athlete has MOC = 68

ml/knmin, and the result in running is 3 minutes 47.68 seconds. His due result: y = 3.17 x 68 + 14.65 = 3 min 50.21 sec. Since the real result - 3 minutes 47.68 s is better than the expected one - 3 minutes 50.21 s, then the running technique of this athlete must be considered effective. Such regression equations are the simplest and provide a very rough estimate of efficiency and technique. This is due to the fact that not one, but several physical qualities determine the result in an exercise.

Therefore, DP is usually characterized by several indicators and the equation takes the following form: y = a1X1 + a2X2 + ...+ anXn + b, where xi, x2, ... xn are the results in DP tests, a1, a2, ...an - coefficients of the equation. Substituting into it the values of indicators of various physical qualities and carrying out calculations, we will obtain the proper result in competitions with average efficiency of the technique. If the actual result is greater than expected, then the implementation efficiency of the technology is high; if it is less, it is low.

When assessing the effectiveness of a technique, it is necessary to remember that the degree of realization of motor potential in a particular movement depends on its complexity.

5. Control of technology mastery

Improving movement technique is carried out in stages, and at each stage it is necessary to monitor its mastery. For this, two criteria are used: 1) the result and 2) the biomechanical characteristics of the exercise. There are two main directions in monitoring the mastery of movements: assessing the stability and stability of the technique.

In the first case, the technique of movements performed under familiar conditions is measured (during training sessions, assessments, etc.). In this case, the influence of confusing factors (emotions, actions of opponents, etc.) on the result of the exercise is insignificant. The stability of the results and values of the main biomechanical characteristics of the exercise will indicate their mastery.

The stability of the technique is determined when the movement is performed in competitions (especially in the fight against strong opponents), under conditions of fatigue, when external conditions change, etc. And in this case, the stability of the indicators will also indicate the mastery of the technology.

Separate control of stability and sustainability is necessary due to the fact that some athletes demonstrate effective technique in comfortable conditions, but in competitions the results sharply decrease and the technique breaks down. Identification of the reasons for insufficient mastery of the technique makes it possible to outline measures to eliminate them (for example, increase the specific volume of specialized exercises, carry out psychoprophylaxis, etc.).

It is important to monitor the mastery of technique during training sessions. Consider the following example. An athlete (runner, swimmer, cyclist, tennis player, etc.) performs repeated exercises during training.

If their biomechanical characteristics are periodically recorded, the following picture will be obtained: at first, the values of these characteristics are relatively stable. Then, from a certain point (its onset is determined by the level of special endurance), the spread of values increases, while still remaining within acceptable limits.

Continuing to perform the exercise leads to an even greater scatter in the values of the characteristics and the appearance of errors. The ability to determine this point during the control process is very important: continuing the exercise can lead not to improving the technique of movements, but to the consolidation of errors.

The stability of the technique is influenced by the attitude towards performing the exercise. A movement can be well mastered, but the effectiveness of the technique will vary if it is performed under different conditions (differences in the surface of the track, differences in shoes, equipment, etc.). This is a natural phenomenon and must be taken into account when monitoring the mastery of exercises.

6. Control of the tactical readiness of athletes

Control of tactical readiness or, what is the same, tactical skill is to assess the appropriateness of the actions of an athlete (team) aimed at achieving success in sports competitions.

The set of such actions is called tactical options. Not only the tactical actions themselves are subject to control, but also various methods of psychological influence on opponents. These techniques are used in joint training, in warm-ups and directly in competitions. There are individual, group and team tactics.

When developing tactic control methods, it is necessary to consider:

1) the structure of competitive activity in a particular sport. For example, there are cyclic sports (middle and long distance running, group cycling, cross-country skiing, etc.) in which there is contact between competitors.

In other cyclic events (100-400 m running, swimming, rowing, etc.) there is no such contact, since competitions are held on separate tracks. There is no contact between competitors in weightlifting either, but, unlike previous sports, they do not perform together, but sequentially, one after another.

A.A. Ter-Ovanesyan and I.A. Ter-Hovhannisyan identifies eight groups of sports with significantly different specifics of competitive activity and, therefore, with different tactics criteria;

2) the influence on tactics of the level of preparedness of athletes, the characteristics of partners and rivals, external conditions, tasks that the athlete needs to solve, etc. Taking into account all these factors is necessary to select a criterion on the basis of which one can judge the optimal tactics of an athlete or team. There are several criteria for optimal tactics: 1) achieving the highest results in competitions; 2) the result may not be the highest, the main thing is to win; 3) not only enter the next round of competition, but also do it with the least amount of energy.

Tactical skill is characterized by the volume, versatility, rationality and effectiveness of tactical actions that an athlete uses in competitions and training. It can be seen that the content of this definition is very close to the definition of manifestations of technology. It is no coincidence that in many sports (especially games and martial arts) they talk not about tactical or technical skill, but about tactical and technical skill. Tactical (or tactical-technical) actions are based on tactical knowledge, as well as the ability to assess situations that arise during a sports match. Therefore, control of tactical skill offers an assessment not only of tactical actions, but also of tactical thinking.

7. Control of tactical thinking

Tactical knowledge in its simplest form is a set of rules about how and in what ways it is necessary to conduct a duel (competition) with opponents. They are tested during a theoretical survey.

It is necessary to take into account that there may be several possible answers to one question and all of them will be correct. This is explained, firstly, by the variety of features that characterize the same tactical situation, and, secondly, by the fact that the athlete (wittingly or unwittingly) chooses the tactical option that best suits his motor and technical capabilities.

Tactical thinking is assessed in two ways. In the first case, experts observe the athlete's actions during competitions, assessing the correctness (tactical expediency) of the decisions he makes.

Main criteria: originality and unpredictability of tactical actions used by the athlete, tactical interactions with partners, understanding of their plans, effectiveness in solving tactical problems, etc. The assessment is carried out in accordance with the rules of examination. In the second case, information and training devices are used, in which the assessed tactical situation is reproduced in front of the athlete on the screen of a video monitor. Simultaneously with the

start of the exposure, the timing device is switched on. The accuracy and speed of solving a tactical problem are assessed.

8. Control of tactical actions

Control of the volume of tactics consists of recording the number of tactical moves and tactical options that are used by an athlete, a group of athletes or a team during competitions (training sessions). The versatility of tactics is characterized by how diverse these moves are. Their information content was determined by comparing the registered values of the winners and losers.

The effectiveness of tactics is characterized by the extent to which the tactical move (option) used in competitions contributed to the solution of the task.

In cyclic sports, the effectiveness of tactics can be monitored by speed dynamics (layout). Any distance can be covered at a uniform and variable speed. In the first case, there are fluctuations in speed over the distance, but they are within ±3%. Such speed fluctuations are typical for average athletes; For a highly qualified person, deviations within ±1% are more typical. If an athlete has chosen a uniform method of covering the distance, then his effectiveness will be characterized by two indicators: 1) the result in the competition and 2) the value of the standard deviation from the average speed over the distance. In principle, the tactic of evenly covering the distance is the most economical. In this case, energy costs are the least compared to other methods of covering the distance.

Variable speed tactical options are numerous and the choice depends on many factors. So, if it is necessary to show the best result, then the distance is covered according to a pre-processed layout. This tactic allows you to provide the least energy consumption and gain an advantage with equal physical and technical readiness.

The effectiveness of a tactic is determined in various ways. Thus, in rowing, it is assessed by the ratio of the time to complete the first and second half of the distance in the control start, as well as by the correspondence of the actual rowing pace to the given one. In sports games, the volume of tactical moves (options) used is compared with their effectiveness. In many cases it is advisable to control tactical actions in different parts of the competition. Monitoring and evaluation of tactical actions must be carried out taking into account the conditions of the competition (route profile in a bicycle race, pool track or rowing channel, etc.).

Control of tactical actions is usually carried out in accordance with a certain criterion. In sports, this is usually the result in competitions. In mass physical culture, the criteria are different - efficiency of actions, rationality, etc.

PRACTICAL SECTION

Topic 1. Functional tests

Practical work 1
Simultaneous functional tests

1. *Orthostatic test.*

Orthostatic reactions of the human body are associated with the fact that when the body moves from a horizontal to a vertical position, a significant amount of blood is deposited in the lower half of the body.

As a result, the venous return of blood to the heart worsens and, as a result, the systolic volume of ejected blood decreases (by 20-30%). Compensation for this adverse effect is carried out primarily by increasing the heart rate (HR). In addition, changes in vascular tone also play an important role. The degree of decrease in venous return of blood to the heart with a change in body position largely depends on the tone of the large veins. If this tone is reduced, then the decrease in venous return can be so significant that when standing up, due to a sharp deterioration in the blood supply to the brain, fainting can occur. Low venous tone can also be the cause of fainting when a person remains in an upright position for a long time - orthostatic collapse.

Carrying out an active orthostatic test is as follows: the subject is in a horizontal position for 5 minutes (e.g, lying on his back), while his pulse is repeatedly counted and blood pressure (BP) is measured. Based on the data obtained, the average initial values are determined. Next, the person stands up and remains in an upright position for 10 minutes in a relaxed position (standing at a distance of 25-30 cm from the wall with his back leaning against it). Immediately after moving to a vertical position, heart rate and blood pressure are recorded again. These same values are then recorded every minute.

The reaction to an orthostatic test is an increase in heart rate. Due to this, the minute volume of blood flow is slightly reduced. In well-trained people, the increase in heart rate is relatively small and ranges from 5 to 15 beats/min. In adolescents, the reaction may be more pronounced. Systolic blood pressure (SBP) either remains unchanged or decreases slightly (by 2-6 mm Hg). Diastolic blood pressure (DBP) increases by 10-15% relative to the value when the subject is in a horizontal position. If during a 10-minute study systolic blood pressure approaches the initial values, then diastolic blood pressure remains elevated.

Signs of orthostatic instability during such a test are a pronounced drop in blood pressure and an increase in heart rate by more than 25-30 beats/min, 16-24 - satisfactory, 9-15 - good, 5-8 - excellent. If during 10 minutes of the study the heart rate does not exceed 89 beats/min, the reaction is considered normal. A heart rate equal to 90-95 beats/min indicates a decrease in orthostatic stability, and a heart rate exceeding 95 beats/min indicates low resistance to changes in body position in space, at which the development of orthostatic collapse is possible.

The response to an orthostatic test improves under the influence of sports training. Moreover, this applies to all athletes, and not just representatives of those sports in which changing body position is a mandatory element.

There is another modification of the orthotest. With the subject lying on his back, after a 3-5 minute quiet position, the pulse rate and maximum blood pressure are determined; After this, the person being examined must quickly stand up, and the pulse is again counted and blood pressure is measured.

With a favorable reaction of the cardiovascular system to this load, the pulse increases by no more than 4 beats per minute, and the maximum blood pressure increases by 10 mm. Such data are considered the best indicators and are taken as an index of 100.

When the cardiovascular system reacts unfavorably, the heart rate increases and maximum blood pressure drops. If the pulse quickens to 40 beats/min or more, and the maximum blood pressure drops by 10 mm, then such data refers to the worst indicators of the functional ability of the cardiovascular system and is taken as an index equal to 0.

The best indices are considered to be 100-85, acceptable 84-75 and worst 74-60. Even lower indices, as a rule, indicate that the student is unfit to perform physical activity. Such children should be prescribed, with appropriate consultation with doctors, therapeutic exercises.

When determining the index by increased heart rate and changes in blood pressure, you can use the data given in table. 1.

Table 1 - Indices of increased heart rate and changes in blood pressure after a functional test

Increased heart rate in a minute	**Changes in maximum blood pressure (mmHg)**										
	Magnification(+)						**Decrease (-)**				
	+10	+8	+6	+4	+2	+0	-2	-4	-6	-8	-10
At 0-4 beats	100	95	90	85	80	75	70	65	60	55	50
At 5-8 beats	95	90	85	80	75	70	65	60	55	50	45
At 9-12 beats	90	85	80	75	70	65	60	55	50	45	40
At 13-16 beats	85	80	75	70	65	60	55	50	45	40	35
At 17-20 beats	80	75	70	65	60	55	50	45	40	35	30
At 21-24 beats	75	70	65	60	55	50	45	40	35	30	25
At 25-28 beats	70	65	60	55	50	45	40	35	30	25	20
At 29-32 beats	65	60	55	50	45	40	35	30	25	20	15
At 33-36 beats	60	55	50	45	40	35	30	25	20	15	10
At 37-40 beats	55	50	45	40	35	30	25	20	15	10	5
At 41-44 beats	50	45	40	35	30	25	20	15	10	5	0

2. *Ruffier's test.* With the subject lying on his back, the number of pulsations in 15 seconds is determined within 4-5 minutes (P1); then within 45 seconds the subject performs 30 squats. After the end of the load, the subject lies down, and the number of pulsations is again counted for the first 15 seconds (P2), and then for the last 15 seconds of the first minute of the recovery period (P3). Heart performance is assessed using the formula:

$$\textit{Ruffier index} = \frac{4\,(Pi + P2 + P3) - 200}{10}$$

The results are assessed by the index value from 0 to 15. Less than 3 - high performance; 4-6 - good; 7-9 - average; 10-14 - satisfactory; 15 and above - bad. There are

$$\textit{Ruffier index}\text{- Dixon} = \frac{(R_2 - 70) + (R_3 - P_i)}{10}$$

other modifications of the calculation:

The resulting Ruffier -Dixon index is rated as good from 0 to 2.9; average - from 3 to 6; satisfactory - from 6 to 8 and bad - above 8.

3. *Belgian test.* Determination of the response of the cardiovascular system to trunk bending.

Within 90 seconds, the subject must perform 20 downward bends with arms lowered, after which the pulse (P) is counted three times in 10 seconds: before the bends (P1), immediately (P2) and 60 s (P3) after them. An indicator characterizing the work of the heart and reflecting the physical capabilities of the subject is calculated using the formula:

(P1 + P2 + P3 - 33) / 10

If the results obtained are within

- 0-0.30 - heart condition is excellent;
- 0.31-0.60 - good condition;
- 0.61-0.90 - average;
- 0.91-1.20 - mediocre;
- 1.21 or more - you need to consult a doctor.

3. Martinet's test. During mass examinations of low-skilled athletes, a one-stage functional test with 20 squats for 30 seconds is most often used. The normal reaction to physical activity of a one-stage functional test is expressed in the fact that the pulse in relation to the initial values increases by 50-70%, systolic blood pressure increases by 15-30%, diastolic blood pressure decreases by 10-30% or remains unchanged. Pulse pressure increases by 60-80% compared to resting data. Restoration of heart rate lasts from 1 to 2-3 minutes, blood pressure - up to 3-4 minutes.

4. *Stange's test.*

The test is as follows: the subject, in a sitting position, takes a deep breath and exhales, then inhales again (approximately 80% of the maximum), closes his mouth and at the same time pinches his nose with his fingers, holds his breath (the stopwatch starts at the end of the inhalation).

Healthy, untrained people are able to hold their breath for 40-55 seconds, athletes - for 60-90 seconds and longer. The better prepared the athlete, the longer he can hold his breath. When tired or overtrained, the time you hold your breath decreases.

5. *Genchi's test.*

The test involves holding your breath after exhaling. If it is carried out after the Stange test or another similar test, then a rest of 5-7 minutes is necessary.

Healthy, untrained people are able to hold their breath for 25-30 seconds, well-trained athletes - 40-60 seconds or longer. Due to the high intensity of the load, the test is used only when examining athletes.

Practical work 2
Two-stage functional tests

1. *Sample D.N. Korobova*(60 jumps for 30 seconds, 2 times with a rest interval of 4 minutes). The subject performs the same load 2 times - 60 jumps for 60 seconds with a rest interval of 4 minutes. Pulse and blood pressure are determined and compared with the original data.

Good functional capacity of the cardiovascular system is revealed by a normotonic response to both physical activities.

If the functionality of the cardiovascular system is reduced, then after the 1st load a normotonic reaction is possible, but after the 2nd load an atypical reaction is noted. If the functional insufficiency of the cardiovascular system is significantly expressed, then an atypical reaction is detected after the 1st load.

2. *Two-stage test L.G. Serkin and A.V. Ionina*(depending on specialization: sprinter - 15 seconds running in place at maximum pace, repeating the load after 3 minutes; weightlifters

- lifting a 32 kg weight with both hands from the floor to chin height, repeating after 5 minutes). Provides for the use of differentiated physical activity on strength, speed and endurance, depending on the athlete's specialization.

For example, a sprinter runs in place for 15 seconds at maximum pace, the load is repeated after 3 minutes. Weightlifters and wrestlers perform a strength test, which involves lifting a 32 kg weight with both hands from the floor to chin height as many times as is obtained by dividing the athlete's body weight by 4.

For example, with a body weight of 68 kg - 17 times at a pace of 1 lift in 1-1.2 seconds, the athlete performs the second load, the same as the first, after 5 minutes. Pulse and blood pressure are examined during this test at rest, in the interval between exercises and during the 10-minute recovery period. In addition to examining pulse and blood pressure, external signs of fatigue and the quality of exercise are taken into account.

Practical work 3
Multi-moment functional tests

1. *Flyers Test*A.

Used for medical examination of highly qualified athletes. The test includes 20 squats, 15 seconds of running in place at a maximum pace, 3 minutes of running in place at a pace of 180 steps per minute. The technique for conducting a combined three-stage functional test is standard.

The first phase - 20 squats for 30 seconds - prepares the body for major physical activity and is considered a warm-up. The second phase - a 15-second run in place at a maximum pace with the hip raised to a horizontal level - determines the body's ability to sharply increase blood circulation, which is an indicator of the body's adaptability to high-speed loads.

The third phase - a 3-minute run in place at a pace of 180 steps per minute with the hip raised to 75 degrees from the horizontal level - helps to identify the body's ability to increase blood circulation over a relatively long period, which determines the body's ability to work for endurance.

When analyzing data from a combined three-stage functional test, the recovery time of pulse and blood pressure is taken into account: after the first phase - 3 minutes, after the second - 4 minutes, after the third - 5 minutes. During the recovery period, the pulse is counted during the first 10 seconds of each minute, and blood pressure is measured in the remaining 50 seconds.

2. *Endurance coefficient*.

The endurance coefficient (EC) characterizes the functional state of the cardiovascular system and is determined by the Kvass formula:

CV = (HR x 10) / PP,

where HR is resting heart rate, PP is pulse pressure.

Score: 16 - normal, above 16 - weakening of the cardiovascular system, below 16 - increased activity of the circulatory system.

TOPIC 2. Psychodiagnostics of personality traits

Practical work 1
Diagnosis of the properties of the nervous system

1. *Diagnosis of the properties of the nervous system*

This questionnaire was developed in relation to sports activities and is widely used in psychological research in the field of sports.

Instructions. You are asked a number of questions regarding your behavior in various situations. Each question must be answered with one of the following options: "yes", "no", "I don't know".

1. Do you easily get along with new teammates, coaches, managers?
2. Are you able to refrain from one or another action until you receive the appropriate order?
3. Is a short rest enough for you to recuperate after tiring work?
4. Are you able to work in adverse conditions?
5. Do you refrain from non-business, emotional arguments while playing sports?
6. Is it easy for you to get involved in training after a long break?
7. Do you achieve better results in competitions than in training?
8. Are you able to assign a certain task to someone and wait patiently for it to be completed?
9. Do you fall asleep equally easily when you go to bed at different times of the day?
10. Can you keep a secret if you are asked to do so?
11. Is it easy for you to return to work that you have not done for several weeks or months?
12. Are you able to quickly calm down and "pull yourself together" as instructed by your coach?
13. Do you willingly strive to participate in responsible competitions?
14. Does monotonous work make you bored or sleepy?
15. Do you fall asleep easily after intense experiences?
16. Are you able to quickly concentrate on the upcoming exercise or task?
17. Are you willing to do difficult and risky exercises?
18. Do you find it difficult to contain your anger or irritation?
19. Are you able to control yourself in difficult moments?
20. Do you know how, when required, to adapt your behavior to the behavior of others?
21. Do you remain cheerful and confident in large and important competitions?
22. Does the composition of the group in which you train affect your well-being and mood?
23. Are you able to endure defeat?
24. Are you confident in your abilities when going to the start?
25. Do unexpected changes in your training and competition schedule cause you irritation?
26. Are you willing to start doing new exercises and mastering new techniques?
27. Are you able to behave calmly when you are waiting for an important decision?
28. Is it easy for you to organize the first days of your vacation?
29. Do you respond quickly to commands?
30. Do you easily adapt your gait or manner to that of slower people?
31. Do you quickly "grab" a new movement or exercise?

32. Are you willing to speak at meetings, seminars, classes?
33. Is it easy for you to ruin your mood?
34. Is it difficult for you to break away from doing exercises and tasks?
35. Is it easy for you to refrain from reprimanding a teammate if he made a mistake?
36. Is it easy to provoke you to do something?
37. Is it easy for you to restrain yourself and not respond to a harsh remark from a partner or coach?
38. Do you always show patience and persistence in repeatedly performing difficult exercises and tasks?
39. Do you easily endure long hours of training?
40. Do you easily engage in conversation with fellow travelers?
41. Do you refrain from making rude remarks about your opponent or their fans?
42. Are you willing to take on work that requires a lot of manual dexterity?
43. Are you able to change a decision you have already made, taking into account the opinions of other people?
44. How quickly do you get used to the new work system?
45. Can you quickly regain your strength after a hard workout or competition?
46. Can you quickly pack up and be ready to go after your workout or competition is over?
47. Do you often give up on your intentions if obstacles arise?
48. Is it easy for you to stick to your usual routine on race days?
49. Do you usually wake up quickly and easily?
50. Are you able to refrain from an immediate, impulsive reaction?
51. Do you find it difficult to train or perform in competitions with noisy spectators?
52. Is it easy for you to refrain from starting prematurely (false starts)?
53. Do you successfully control your excessive excitement when going to the start line?
54. Do you quickly get used to a new training place?
55. Do you like frequent changes?
56. Do you tend to take unnecessary risks in competitions?
57. Do you like to work long and painstakingly to perfect the technique of a particular exercise?
58. Can you perform the exercise at the end of the workout as easily and freely as at the beginning?
59. Do you often experience sudden mood swings before the start of a competition?
60. Can we say that most often before the start you are in a state of “combat readiness”?
61. Do you like intense workouts?
62. Can you refrain from making inappropriate remarks?
63. Does it matter to you to have a permanent place in the locker room, in the gym, on the track, on the track during training?
64. Do you easily move from one activity to another?
65. Do you weigh the pros and cons before making an important decision?
66. Is it easy for you to continue competing if you failed or made a mistake at the very beginning?
67. Do you feel rushed during warm-ups at competitions?
68. Do you quickly get bored with monotonous training sessions?

69. Is it easy for you to contain your outward expression of joy from winning a competition?

70. Do you refrain from unnecessary movements and gestures when speaking, speaking, or answering questions?

71. Do you enjoy a lively environment during training sessions or competitions?

72. Do you like long-term activities that require great skills?

73. Are you able to focus your attention on a specific task for a long time?

74. Do you enjoy training tasks that require fast movements?

75. Do you know how to control yourself in difficult situations?

76. Do you quickly get to work when given a task?

77. Are you able to wait patiently after finishing a training session to leave the training area in an orderly manner?

78. Are you able to quickly pull yourself together after making a mistake and successfully complete the exercise?

79. Do you scan newspapers quickly?

80. Do you ever speak so quickly that you cannot be understood?

81. Can you work normally without getting enough sleep?

82. Are you able to work for long periods of time without interruption?

83. Are you able to exercise freely if you have a toothache or headache?

84. Are you able, if necessary, to calmly finish your work, knowing that your comrades are warming up or waiting for you?

85. Do you respond quickly to unexpected questions?

86. Do you prefer speed-strength exercises in your warm-up?

87. Can you remain calm and composed if the judges make mistakes towards you?

88. Is it easy for you to change the competitive tactics you planned earlier?

89. Are you patient?

90. Can you easily adapt to a slower pace of exercise if necessary?

91. Is it easy for you, while preparing for the start, to simultaneously perform several other actions (help a friend, answer questions)?

92. Can teammates easily change your bad mood?

93. Can you easily perform several actions at the same time?

94. Do you maintain mental balance when you witness an accident on the street?

95. Do you like work that requires a lot of different manipulations?

96. Is it easy for you to remain calm when you have to wait a long time for the announcement of the results of the competition?

97. Are you independent in difficult life situations?

98. Do you feel free in a large or unfamiliar company?

99. Can you immediately interrupt a conversation if necessary?

100. Do you easily adapt to different working styles of different trainers?

101. Do you like to change places of training and competitions often?

102. Do you tend to take the initiative when something out of the ordinary happens?

103. Do you refrain from making inappropriate comments towards judges or competition organizers when they make mistakes?

104. Do you immediately start working at full strength during training?

105. Do you dare to oppose conventional wisdom if you think you are right?

106. Does failure in competition motivate you?

107. Do you easily regain your peace of mind after losing a competition?

108. Are you able to wait calmly, for example, in a queue?

109. Do you refrain from intervening if you know in advance that it will lead to nothing?

110. Are you able to calmly wait for the signal to start the competition?

111. Are you able to react instantly in unexpected directions?

112. Do you remain quiet when asked to do so?

113. Do you agree without much internal hesitation to painful medical procedures?

114. Can you work intensively?

115. Are you willing to change places of entertainment and recreation?

116. Is it difficult for you to get used to a different daily routine?

117. Are you willing to compete when you know your opponent is stronger than you?

118. Is it easy for you to extinguish in your mind the idea of past failures in competitions if they suddenly arise?

119. Do you feel easy during training if you have to perform various exercises and tasks?

120. Do you control your feelings when going to the start line?

121. Are you willing to perform exercises in large series during training?

122. Is it easy for you to force yourself to do risky and dangerous exercise?

123. Does your voice break in unusual situations?

124. Are you able to be distracted by extraneous stimuli during training?

125. Are you able to stand for a long time or sit quietly if you are asked to do so?

126. Are you able to suppress your fun if it might offend someone?

127. Do you easily move from sadness to joy?

128. Is it easy for your opponent to throw you off balance during competition?

129. Do you easily comply with the rules of conduct required in your environment?

130. Are you willing to perform in demonstrations or at meetings with the public, schoolchildren, etc.?

131. Do you get to work quickly, without additional preparation?

132. Are you ready to come to the aid of another person, risking your life?

133. Are your movements energetic?

134. Are you willing to do responsible work?

Key to the questionnaire. The degree of expression of the properties of the nervous system (the strength of the processes of excitation and inhibition, as well as their mobility) is assessed by summing up the points received for answering questions. If the answer matches the code, it is worth two points; if it does not match, then it receives a zero score; The answer “I don’t know” is worth one point.

Questionnaire code:

The strength of excitation processes.

Answer "yes": 3, 4, 7, 13. 15, 16, 19, 21, 23, 24, 32, 39, 45, 56, 60, 61, 66, 72, 73, 78, 81, 82, 83 , 94, 97, 98, 102, 105, 106, 113, 114, 117, 121, 122, 124, 130, 132, 133, 134;

The answer is “no” - 47, 51, 107, 123.

The strength of braking processes.

Answer "yes": 2, 5, 8, 10, 12, 16, 27, 30, 36, 37, 38, 41, 48, 50, 52, 53, 62, 65, 69, 70, 75, 77, 84 , 87, 89, 90, 96, 99, 103, 108, 109, 110, 112, 118, 120, 125, 126, 129;

The answer “no”: 34, 36, 59, 67, 128.

Mobility of nervous processes.

Answer "yes": 1, 6, 9, 11, 14, 20, 22, 26, 28, 29, 31, 33, 40, 42, 43, 44, 46, 49, 54, 55, 64, 68, 71 , 74, 76, 79, 80, 85, 86, 88, 91, 92, 93, 95, 100, 101,107, 111, 115, 116, 119, 127, 131;

The answer “no”: 25, 57, 63.

The balance of nervous processes is assessed by the ratio of the sums of the strengths of the processes of excitation and inhibition.

A score of 42 points or higher for each property is considered to be a high degree of its expression.

Practical work 2

Studying the properties of temperament

G. Eysenck test

Using this questionnaire, three indicators are assessed: extraversion, neuroticism, attitudinal behavior (“lie scale”). The questionnaire is recommended for use when studying adult athletes.

Instructions. You are asked a series of questions characterizing your behavior in various situations. You can only answer “yes” or “no” to questions.

1. Do you like the excitement and bustle around you?
2. Do you often have a restless feeling that you want something, but you don’t know what?
3. Are you one of those people who don't mince words?
4. Do you feel sometimes happy and sometimes sad for no reason?
5. Do you usually keep a low profile when you're in company?
6. As a child, did you always do immediately and irrevocably what you were told to do?
7. Do you sometimes have a bad mood?
8. When you are drawn into a quarrel, do you prefer to remain silent, hoping that everything will work out?
9. Are you easily susceptible to mood swings?
10. Do you like being around people?
11. Have you often lost sleep because of your worries?
12. Are you stubborn sometimes?
13. Would you call yourself dishonest?
14. Do good thoughts often come to you too late?
15. Do you prefer to work or study alone?
16. Do you often feel lethargic and tired for no good reason?
17. Are you a lively person by nature?
18. Do you sometimes laugh at indecent jokes?
19. Do you often find yourself so undernourished that you feel “fed up”?
20. Do you feel self-conscious in anything other than casual clothing?
21. Do your thoughts often wander when you are trying to focus on something?
22. Can you quickly express your thoughts in words?
23. Are you often lost in your thoughts?
24. Are you completely free from all prejudices?
25. Do you like April Fools' jokes?
26. Do you often think about your business?
27. Do you really like to eat delicious food?
28. Do you need a friendly person to talk you out when you're angry?
29. Do you hate borrowing or selling something when you need money?

30. Do you brag sometimes?
31. Are you very sensitive to certain things?
32. Would you rather be alone at home than go to a boring company?
33. Do you sometimes get so restless that you can't sit still for long?
34. Do you tend to plan your affairs carefully and earlier than you should?
35. Do you ever feel dizzy?
36. Do you do a better job of thinking about it on your own rather than discussing it with others?
37. Do you always respond to emails immediately after reading them?
38. Do you ever feel short of breath even if you haven't done any strenuous work?
39. Would you say that you are a person who doesn't care about things being exactly the way they should be?
40. Are your nerves bothering you?
41. Do you prefer to make plans than to act?
42. Do you sometimes put off until tomorrow what you should do today?
43. Do you get nervous in crowded places?
44. When meeting people, are you usually the first to take the initiative?
45. Do you have severe headaches?
46. Do you usually think that everything will work itself out and go back to normal?
47. Is it difficult to fall asleep at night?
48. Have you ever lied in your life?
49. Do you sometimes say the first thing that comes to mind?
50. How long do you worry after the embarrassment that happened?
51. Are you usually closed off to everyone except your close friends?
52. Do troubles often happen to you?
53. Do you like to tell stories to your friends?
54. Do you prefer to win than to lose?
55. Do you often feel awkward in the company of people above you?
56. When circumstances are against you, do you usually think that something else is worth doing?
57. Do you often get a “sick feeling in the pit of your stomach” before an important task?

Key to the questionnaire:

Extraversion: answers “yes” to questions 1, 3, 8, 10, 13. 17, 22, 25, 27, 39, 44, 49, 53, 56 give 1 point; Answers “no” to questions 5, 15, 20, 29, 32, 34, 37, 41, 51 give 1 point. The total amount of points is found.

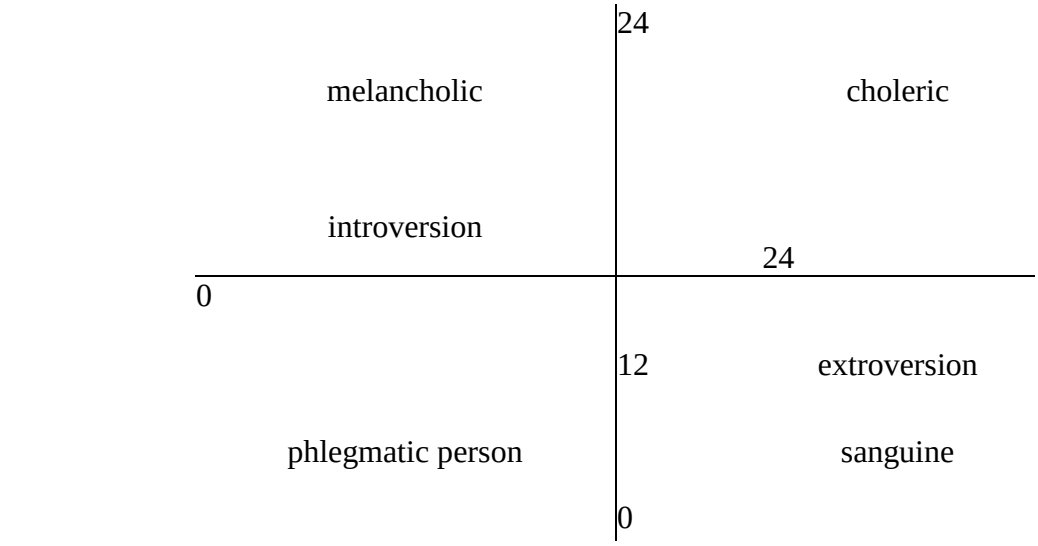
Neuroticism: 2, 4, 7, 9, 11, 16, 19, 20, 21, 23, 26, 28, 31, 33, 35, 38, 40, 43, 45, 47, 50, 52, 55, 57 - “yes” answers are worth 1 point. The total amount of points is found.

Deceit: answers “yes” to questions 6, 24, 36 - 1 point; answers “no” to questions 12, 18, 30, 42. 48, 54 - 1 point. The sum of points is found.

If the number of points on the “insincerity” scale is five or more, processing the results does not make sense, the answers are untruthful.

If the number of points on the “extra-introversion” scale is less than 12, then we are talking about predominant introversion, if more than 12, then we are talking about predominant extroversion.

The assessment on the “neuroticism - stability” scale is carried out similarly to the previous one. If more than 12 points - neuroticism, less than 12 points - stability. The obtained data is transferred to the graph (Fig. 4) and the temperament sector is determined along the axes of intersection of individual coordinates.



Rice. 4 - Properties of temperament according to G. Eysenck

Practical work 3

Diagnosis of character traits

Character is a socially formed structural component of personality. It is the character of an athlete that determines his attitude towards training, competition, teammates, coach, etc. Often an athlete who is endowed with a sense of responsibility and has a firm, strong character wins competitions. If we talk about abilities and character, then it is character that determines the manifestation of an athlete’s abilities.

1. Revealing resilience and strength of character

Instructions. Carefully read each of the twenty proposed questions and choose the answer that is most typical for you.

1. Do you often think about the impact your actions have on others?
   A) very rarely
   B) rarely
   B) quite often
   D) very often
2. Does it happen to you to say something that you yourself do not believe (due to stubbornness, in defiance of others, or for reasons of prestige)?
   A) yes
   B) no
3. Which of the following qualities do you value most in people?
   A) perseverance
   B) breadth of thinking
   C) efficiency, ability to show oneself
4. Do you have a penchant for pedantry?
   A) yes
   B) no
5. Do you quickly forget about troubles that happen to you?

A) yes
B) no

6. Do you like to analyze your actions?
A) yes
B) no

7. Being among persons known to you:
A) try to maintain the tone accepted in this circle
B) remain yourself

8. When starting a difficult task, do you try not to think about the difficulties that await you?
A) yes
B) no

9. Which of the following definitions do you think best applies to you?
A) dreamer
B) “shirt-guy”
C) diligent in work
D) punctual, neat
E) “philosopher” in the broad sense of the word
F) a fussy person

10. When discussing a particular issue:
A) express your point of view, although it may differ from the majority opinion
B) you think that in this situation it is better to remain silent, although you have a different point of view
C) support the majority, remaining unconvinced
D) don’t bother thinking and accept the point of view of the majority

11. How do you feel when you get an unexpected call from your manager?
A) irritation
B) anxiety
C) concern
D) does not cause any feeling

12. If, in the heat of controversy, your opponent “breaks down” and makes a personal attack against you, what will you do:
A) answer him in kind
B) ignore this fact
B) be demonstratively offended
D) offer to take a break

13. If your work is rejected, it causes you:
A) annoyance
B) shame
B) anger

14. If you get into trouble, who do you blame first?
A) yourself
B) “fatal bad luck”
C) other objective circumstances

15. Don't you think that people around you (managers, colleagues, subordinates) underestimate your abilities and knowledge?
A) yes
B) no

16. If your friends and colleagues start making fun of you, what do you do?
A) be angry with them

B) try to retreat

C) without getting irritated, you begin to play along with them D) you respond with laughter and, as they say, zero attention D) you act indifferent, smile, but in your heart you are indignant

17. If you are in a hurry, and your usual place does not have your briefcase, umbrella, gloves, etc., then what do you do?

A) you will continue your search in silence B) you will search, simultaneously blaming your family for the mess C) you will leave without the thing you need

18. What is most likely to throw you off balance?

A) long line

B) crowding on public transport

C) the need to come to a certain place several times for the same issue

19. Having finished the argument, do you continue to conduct it mentally, bringing more and more new arguments in defense of your point of view?

A) yes B) no

20. If you need to do urgent work

to choose an assistant, which of the candidates will you choose?

A) a dutiful person, but lacking initiative B) a knowledgeable person, but stubborn and argumentative C) a gifted person, but lazy

The results of the answers are assessed on a rating scale, then the total score is calculated.

Grading scale

1. A – 0	7. A - 2	11 A - 0	16. A - 0
B – 1	B - 0	B - 1	B - 1
C - 2	8. Yes - 0	C - 2	C - 2
D – 3	No - 2	D - 0	D - 0
2. Yes – 0	9. A - 0	12 A - 0	E - 1
No – 1	B - 1	B - 2	17. A - 2
3. A – 1	C - 3	C - 1	B - 0
B – 1	D - 2	D - 3	C - 1
C – 0	E - 2	13 A - 2	18. A - 1
4. Yes – 2	F - 0	B - 1	B - 0
No – 0	10. A - 2	C - 0	C - 2
5. Yes – 0	B - 0	14 A - 2	19. Yes - 0
No – 2	C - 0	B - 0	No - 2
6. Yes – 2	D - 0	C - 0	20. A - 0
No – 0		15 Yes - 0	B - 1
		No - 2	C - 2

Diagnostic significance of the results obtained. Below 15 points. Such a person is characterized by weak character, imbalance and carelessness. For the troubles that happen to him, he is ready to blame anyone, but not himself. It is difficult to rely on him in friendship and at work. He does not have sufficient reliability in his relationships with his colleagues.

From 15 to 25 points. Such a person has a fairly strong character. He has a realistic outlook on life, but not all of his actions are equal. He has breakdowns and delusions. He is conscientious and quite easy to work with in a team. And yet he has something to think about and get rid of some shortcomings.

From 26 to 28 points. This is a persistent person with a sense of responsibility. He values his own judgments, but also takes into account the opinions of others, correctly navigates situations that arise, and in most cases knows how to choose the right decision. This indicates the presence of strong character traits. He is not alien to the feeling of narcissism and can show cruelty towards others.

Practical work 4

Studying the mental reliability of an athlete

Methodology V.E. Milman, V.L. Marischuk.

Mental reliability is considered as the stability of the functioning of basic mental mechanisms in difficult competitive conditions.

It includes: competitive emotional stability, self-regulation, motivational and energetic component, stability and noise immunity.

Indicators of competitive emotional stability: nature, intensity of pre-competitive and competitive emotional arousal, and its fluctuations, the degree of its influence on the athlete's performance.

Indicators of self-regulation: awareness and assessment of one's emotional state, the ability to influence it, the ability to rebuild during a struggle, control over one's actions.

Indicators of the motivational sphere: love of sports, desire to fight, complete dedication in training and competitions.

Indicators of stability and noise immunity: stability of the functional state, stability of motor skills, immunity to the effects of interference.

Below is the Mental Reliability Questionnaire and the key to it.

Instructions. Before you are questions, the purpose of which is to identify the psychological characteristics of your sports activity.

For each question, choose one of the three suggested answers and write it on the answer sheet next to the question number.

1. In what cases do you perform successfully in competitions?
   A) being in a calm state, when I'm not worried
   B) being in a state of heightened excitement
   C) in a state of strong excitement
2. Do you usually get very nervous during competitions?
   A) Yes
   B) Sometimes
   C) No
3. Do you usually accurately assess the degree of your anxiety and other emotional states?
   A) Yes
   B) I can't say for sure
   C) No
4. Do you like performing in estimation exercises and control exercises?
   A) Yes
   B) I can not say exactly
   C) No
5. Can you maintain a consistent level of high performance during the most important period of the season?
   A) Yes
   B) there are fluctuations
   C) No
6. Is your technology stable?
   A) Yes

B) there are fluctuations
C) No

7. Do unexpected interruptions really throw you off?
A) Yes
B) Sometimes
C) No

8. Does competition anxiety stop you from performing at your best?
A) Yes
B) Sometimes
C) No

9. Do you give your all at important competitions?
A) Yes
B) Sometimes
C) No

10. Do you willingly perform volumetric, intense loads?
A) Yes
B) not always
C) No

11. Do failures have a big impact on you?
A) yes, very frustrating
B) quickly forgotten
C) I don't attach much importance to them

12. In what cases do you achieve the best results?
A) with strict control over your actions
B) when executed automatically
C) something in between

13. Do you have serious, inexplicable mistakes during important competitions that affect the results of your performances?
A) Yes
B) Sometimes
C) practically never happens

14. With a successful combination of circumstances, do you have the feeling that “the job is done”, “that everything would soon be over”?
A) Yes
B) Sometimes
C) No

15. When do you usually start to feel nervous before a big competition?
A) a few days before the competition
B) on the eve of the competition
C) just before the start

16. Is it difficult for you to disconnect from thoughts about your upcoming performance at important competitions?
A) Yes
B) No
C) I can switch off, but not for long

17. Do you carry out special adjustments before going to the start? (several options possible)
A) no, I won't
B) I try to calm down, relieve tension

C) I try to think about something pleasant
D) focusing on the upcoming performance
E) I'm trying to get active and tone up my muscles.
F) I try to distract myself from the thought of the upcoming competition
and) I try to induce sports anger in myself
G) I'm going over in my mind the tactical and technical aspects of the upcoming-final performance
K) I use warm-up as a psychological adjustment

18. Can you quickly switch from one type of setting to another if you see fit?
A) No
B) usually this is not necessary
C) Yes

19. During wrestling, can you quickly force yourself to calm down if necessary?
A) No
B) not always
C) usually I can

20. Do you use verbal orders to yourself for these purposes?
A) No
B) usually this is not necessary
C) Yes

21. Are you willing to sacrifice a lot in life for success in sports?
A) yes, I can give up a lot
B) this problem has not arisen yet
C) No

22. What is your attitude towards competitions?
A) competition is a difficult exam
B) competition is a holiday
C) both

Processing survey materials. The number of points for each component is calculated. A score of "0" points corresponds to the average level of mental reliability. A score with a "-" sign indicates a decrease in the level of reliability, a score with a "+" sign indicates an increase in the level of reliability.

Key to the "Mental Reliability" questionnaire

	Components of Mental Reliability											
	SEU			SR			ME			StP		
	A	B	C	A	B	C	A	B	C	A	B	C
1	-2	-1	+1									
2	-2		+1									
3				-2	-1	+1						
4							+1		-1			
5										+1	-1	-2
6										+1	-1	-2
7										-2	-1	+1
8	-2	-1	+1									
9							+1	-1	-2			
10							+1	-1	-2			

11							+1	-1	-2			
12				+1	-1							
13	-2		+1									
14	-2		+1									
15	-2	-1										
16				-2	+1	-1						
17	The nature of emotional reactions: a - neutral; d, b, c, e, - asthenic								f, g, k, - sthenic;			
18				-2		+1						
19				-2	-1	+1						
20				-1		+1						
21							+1	-1	-2			
22							-1	+2	+1			

Practical work 5

Athlete Noise Immunity

Test G.D. Babushkina, Yu.V. Yakov.

Noise immunity is the ability of an athlete to perform a certain activity without reducing results under the influence of various interferences (external, internal). For a football player, such obstacles can be biased refereeing, the actions of opponents, etc. For a gymnast, an unsuccessful start to the competition; poor performance by teammates; biased judging, etc.

This questionnaire is intended to study the quality of noise immunity in team sports athletes. With appropriate processing of the content of the questions, it can be used in other sports.

*Instructions.*Dear athlete! Please answer the questions posed that reflect your behavior at the competition. Choose one of the suggested answers and place it next to the question.

1. Do you usually get very nervous during competitions?
   A) Yes
   B) Sometimes
   C) No
2. Do you like to perform in estimations and control training?
   A) No
   B) not always
   C) Yes
3. Do failures have a big impact on you?
   A) Yes
   B) not always
   C) I don't attach much importance to them
4. Do unexpected interruptions really throw you off?
   A) Yes
   B) Sometimes
   C) No
5. Do you often experience a negative state during competitions?
   A) Yes
   B) Sometimes
   C) No

6. Do you experience serious, unexplained errors during competitions that affect your performance?
   A) Yes
   B) Sometimes
   C) No
7. Can competition conditions affect your competitive performance?
   A) Yes
   B) Sometimes
   C) No
8. Do spectators have a negative influence on you during competitions?
   A) Yes
   B) Sometimes
   C) No
9. Can incorrect or biased actions by a judge throw you off balance?
   A) Yes
   B) Sometimes
   C) No
10. Do you get annoyed when the coach makes comments to you during the game?
   A) Yes
   B) Sometimes
   C) No
11. Can your partner's bad actions affect your mental state?
   A) Yes
   B) Sometimes
   C) No
12. Does a strong, competent and active opponent make you nervous and feel like “it would all be over soon”?
   A) Yes
   B) Sometimes
   C) No
13. Do you give up when you make mistakes in the game and your actions are unsuccessful?
   A) Yes
   B) Sometimes
   C) No
14. Could constantly being behind in the score or playing point-to-point make you feel unstable or unsure?
   A) Yes
   B) Sometimes
   C) No
15. Could unfavorable relationships on your team negatively impact your performance in the game?
   A) Yes
   B) Sometimes
   C) No
16. Does competition anxiety stop you from performing at your best?
   A) Yes
   B) Sometimes
   C) No

17. In what cases do you perform successfully in competitions?
A) being in a calm state
B) being in a state of heightened excitement
C) in any condition
18. During a sports fight, can you, if necessary, force yourself to quickly calm down?
A) No
B) not always, c) yes
19. Does the onset of fatigue reduce the effectiveness of your actions in competitions?
A) Yes
B) Sometimes
C) No
20. During what period of competition are your actions most effective?
A) in the first quarter of the game
B) in the first half of the game
C) throughout the game

Key to the questionnaire. Answers "a" are worth 1 point, answers "b" are worth 2 points, answers "c" are worth 3 points. The total amount of points characterizing the athlete's noise immunity is found. The maximum value is 60 points, the minimum is 20 points.

Practical work 6

Diagnosis of the properties of the nervous system

Questionnaire of the Polish psychologist J. Strelyau.

This questionnaire can be used when studying any group of subjects (by age and occupation).

Instructions: Assess the severity of your symptoms characterizing the properties of the nervous system on the following scale:

Yes answer:

A) extremely +3
B) moderately +2
C) to a small extent +1

Uncertain answer - 0

The assessment is placed opposite the indicators in the protocol (Table 1).

1. If I fail, I continue until the end.
2. Reprimand from parents and teachers has a positive effect on my condition and behavior.
3. Indifferent to ridicule and attempts to make fun of me.
4. I easily concentrate and maintain attention during mental work, despite interference (noise, conversations, etc.).
5. I easily focus my attention on doing physical work.
6. After an argument, quarrel or other troubles, I easily calm down and focus on the desired activity.
7. I can easily restrain and control myself in the most unexpected situations.
8. I calmly and patiently do difficult work.
9. In difficult situations, I remain collected, calm, and patient.
10. On the eve of any event (exam, celebration, travel, etc.) my behavior does not differ from usual.
11. I have mood swings over trifles.
12. As a rule, I sleep soundly before tests (exams, competitions).

13. Able to restrain himself, I can quickly calm down on demand.

14. I am calm about biased assessments of my activities.

15. In exciting situations (dispute, quarrel, exam), I show calmness and composure, I control myself.

16. I am not quick-tempered, not irritable.

17. I show restraint and self-control in the face of unexpected news.

18. I easily keep interesting news secret.

19. Able to patiently repeatedly perform a variety of exercises that require painstaking work, to achieve clarity and completeness of the work performed.

20. I carefully and leisurely prepare for the start of an important task.

21. My mood is usually even and stable.

22. Activity in studies, sports, everyday life, etc. manifests itself evenly, without periodic ups and downs.

23. I have uniform and correct speech, restrained movements.

24. I easily master complex tasks in class, and I strive to begin completing them as soon as possible.

25. I often make mistakes, even gross ones, because I'm in a hurry.

26. I start completing a new task immediately, without much thought.

27. I react quickly to the actions of other people and to changing conditions.

28. I quickly acquire new skills and habits in classes and in life, and I can change them without much difficulty.

29. I easily correct my mistakes.

30. I easily and quickly get used to the character, requirements of new teachers, to new living and working conditions.

31. I easily make new acquaintances, I love being with people.

32. I quickly switch from rest to business, getting involved in work.

33. I can quickly move from one job to another, from one activity to another.

34. I love it when assignments change frequently.

35. I fall asleep easily and quickly, wake up, and get up.

36. I easily switch from experiencing failures and troubles to some kind of activity.

37. My mood often changes.

38. My feelings are clearly manifested in facial expressions, movements, and speech.

39. My speech and movements are very fast, but I can force myself to speak and move more slowly.

Completing the task. Add up the points with the "+" sign and the "-" sign separately in each of the three columns (Table 10), find the algebraic sum and convert them into percentages. 100% is the total number of marks minus dashes (zero answer, if any), multiplied by three. Record the obtained values in the protocol. Then, based on these data, a conclusion is made about the severity of the properties of the nervous system

more - a high degree of severity of the property, 49-25 points - average, 24-0 - low.

The numbers corresponding to the boundaries with the "+" sign characterize high, medium and low degrees of strength, mobility and balance, with the "-" sign - weakness, imbalance and inertia of the nervous system. The type of temperament is determined by the totality of the properties of the nervous system.

At the same time, the following boundaries are adhered to: 50 points and a higher degree of severity of the property, 49-25 points - average, 24-0 - low. The numbers corresponding to the boundaries with the "+" sign characterize high, medium and low degrees

of strength, mobility and balance, with the “-” sign - weakness, imbalance and inertia of the nervous system. The type of temperament is determined by the totality of the properties of the nervous system

Table 10 - Minutes for assessing the properties of the nervous system

Properties of the nervous system					
Force		Equilibrium		Mobility	
Indicator No.	grade	Indicator No.	grade	Indicator No.	grade
1 2 3 16		17 18 19 32		33 34 35 48	
Sum points with a "+" sign		Sum points with a "+" sign		Sum points with a "+" sign	
Sum points with a "-" sign		Sum points with a "-" sign		Sum points with a "-" sign	
Algebraic sum of points		Algebraic sum of points		Algebraic sum of points	
in %		in %		in %	

TOPIC 3. DIAGNOSTICS OF INTERPERSONAL RELATIONSHIPS IN A SPORTS TEAM

Small group as an object of diagnosis

A sports team, study group, class is a small group with a socially significant goal, endowed with leadership. The nature of the developing interpersonal relationships in them has a significant impact on the fulfillment of the tasks assigned to the teacher and coach.

There are two criteria that allow us to talk about a group as a subject of activity: frequency and duration of interaction between group members; the number of its constituent members (from 2 to 45). There is a direct connection between the number, frequency and intensity of communications in a group and its cohesion: the number and strength of mutual positive and negative choices are indicators for determining group cohesion.

In Russian psychology, a small group is considered as a sphere for identifying the capabilities of an individual, manifestation of his individuality, as an environment in which a personality is formed. In this regard, research into personality in a group is relevant and makes it possible to solve practical problems related to group management. The main feature of a small group is the immediacy of communication between its members, which is the subject of the study. When studied, groups are undifferentiated and characterized by fragility. There are no subgroups identified in the group.

Relationships acquire special significance and coloring at school age. Personal relationships arise not only on the basis of likes, but also on the activities performed. Personal and business relationships are closely connected, and this is used in school pedagogy when recruiting groups to organize additional classes with lagging students.

Relationships in groups involved in sports (education and training groups of youth sports schools, sports teams) develop mainly on a business basis and depend on sports qualifications, the status of the athlete in the group or team. Personal qualities at this age are not the leading factor in the formation of relationships. At this age, there are two communication structures in groups: business (formal) and interpersonal (informal).

Informal structure depends on the formal structure of the group to the extent that individuals subordinate their behavior to the goals and objectives of joint activity. Diagnostics allows us to assess the extent of this influence.

For sports activities (especially in children's and youth sports), it is important that the structure of an informal nature is projected (influences) the system of business relationships, affects the cohesion of the group and the results of collective activities.

When psychodiagnostics of relationships in a group, it is important to know that business and interpersonal relationships are differentiated according to the parameters “attitude” and “communication”.

Psychological attitude is the internal reality of the subject, which is a reflection of other people in thoughts and experiences. Attitude is the internal state of the subject.

Communication is a process of verbal and non-verbal interaction in which interpersonal relationships are manifested, consolidated and developed. Communication is an externally observable process that does not always reflect the essence of interpersonal relationships. Therefore, interpersonal relationships and communication require different methods for their diagnosis.

One of the most effective methods for studying the structure of small groups, as well as the position of an individual in a group, is sociometry.

Practical work 1

Sociometry

This method has found widespread use in the study of various problems of sports groups and teams.

Goal: identifying interpersonal relationships in a sports team.

Instructions for team athletes. You need to answer the following question: "Which team member would you invite to your birthday?" First, write the name of the person you would invite first, and then the person you would invite second and third.

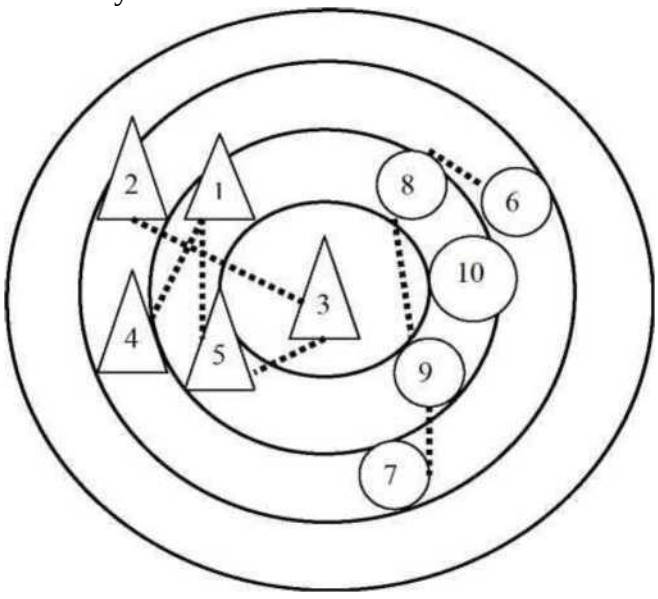
Instructions for the teacher. In 10 minutes. collect pieces of paper that must be signed. If the student does not indicate anyone, then he turns in a sheet only indicating his last name. The study is carried out in a group several times (every 3-4 months) to increase reliable answers. It is better to carry out repetition in a slightly different form. For example, you can ask other questions:

- Who would you like to have as a neighbor in your apartment or in your yard?
- Who would you like to go hiking with?

Processing the results. The data is entered into the main results table. The surnames of all members of the group being studied are written in the left column (in alphabetical order, first boys, then girls), along the horizontal line - only their numbers. At the corresponding intersections, the numbers 1, 2, 3 indicate those whom each student chose in the 1st, 2nd, 3rd line.

Then mutual elections are indicated. If among those whom the participant chose, there are those who chose him, then this means that he and these students have mutual elections. In the table they are underlined or circled. Next, the number of elections received by each participant and the number of mutual elections are calculated vertically.

The psychological well-being of an individual is largely determined by the sociometric method. To get a clearer picture of the position in the team, based on the data in the table, a map of group differentiation is drawn up (Fig. 5). In its simplest form, it looks like a shield consisting of four concentrically located circles. Each circle determines the student's position based on the results of the study.



Rice. 5 - Sociometric matrix

In the first circle are students who received 6 or more selections, in the second circle - 3-5 selections, in the third circle - 1-2 selections, and in the fourth circle are those who did not receive a single selection. A favorable position in the team is observed among athletes who are in the first ("stars") and second circles; an unfavorable position, which reduces the strength of personality, is observed among the "outcasts." On the map, boys are indicated by triangles, girls by circles. Dotted lines indicate mutual elections.

Selection results

Who is chosen											
No.	Who chooses	1	2	3	4	5	6	7	8	9	10
1	Avdeev			1	3	2					
2	Borisov	1		2			3				
3	Bohan		1			3				2	
4	Volodin	1		2		3					
5	Gorin	1		3	2						
6	Voitova		2					1			3
7	Gashchenko								1	2	3
8	Denisova			1			2			3	
9	Evdokimova							1	2		3
10	Zhuk			3		2			1		
Number of received		3	2	6	2	4	2	2	3	3	3
Of these, mutual		2	2	2	2	3	1	1	1	2	0

When summing up, you can additionally find out:

- what provides this or that athlete a certain place in the structure of interpersonal relationships in the group (conversation, data from psychological techniques);
- does the position of individual athletes affect the group as a whole (conversation, observation);
- are the “stars” the actual leaders of this team, what type of leaders are they;
- what explains the position in the team of those whom no one chose (character traits, position of habit);
- what causes the presence of separate groups, what is the unifying principle in them;
- what is the role of the group in the life of the team.

There may be discrepancies between the actual relationships and those that can be assumed based on the map. This is because the resulting data informs not only actual but also desired relationships. Long-term observation of the researcher and trainer allows the results to be corrected.

Based on data from this methodology, the researcher is looking for ways to equalize the social status of the “outcasts” and unite individual groups into a common team. Leveling the position of athletes requires the use of different techniques depending on the characteristics of their charater, attitudes, interests and abilities: this could be, for example, a message about the athlete’s achievement, praise, activation of his self-education, his participation in communication training, self-confidence, in significant general affairs.

Using this method, business and interpersonal relationships in a sports team are studied. When studying business relationships, questions are asked related to the business area of activity in teams. When studying interpersonal relationships, questions are asked regarding the non-business activities of the team.

Advantages and limitations of the sociometric method:

1. The practical value of the sociometry method is undoubted and lies in the ability to penetrate into the invisible, but really existing group structures of interpersonal and business relationships.

2. The limitation of this method lies in the manifestation of subjectivity when obtaining information about people's relationships.

3. The value of the sociometry method increases when other methods are used (conversation, interview).

Working with a sports team requires a good understanding of those group processes that determine the cohesion or disunity of team members and their emotional well-being. One of the important sections of psychological and pedagogical control in a sports team is the operational diagnosis of the characteristics of the team and the general group situation (psychological atmosphere). Below are two methods for studying relationships in a sports team.

Practical work 2

Psychological atmosphere in the team

Instructions. Below are opposite pairs of words that can be used to describe the atmosphere in a sports team. The closer you place the "x" to the right or left word in each pair, the more pronounced this feature is in your team.

So, the atmosphere in your team is characterized by:

Friendliness	1	2	3	4	5	6	7	8	Hostility
Agreement	1	2	3	4	5	6	7	8	Disagreement
Satisfaction	1	2	3	4	5	6	7	8	Dissatisfaction
Passion	1	2	3	4	5	6	7	8	Indifference
Productivity	1	2	3	4	5	6	7	8	Unproductivity
Heat	1	2	3	4	5	6	7	8	Cold
Cooperation	1	2	3	4	5	6	7	8	Lack of it
Mutual support	1	2	3	4	5	6	7	8	Malice
Entertaining	1	2	3	4	5	6	7	8	Boredom
Success	1	2	3	4	5	6	7	8	Failure

The answer to each of the ten points is scored from left to right from 1 to 8 points, depending on which of the characteristics the "x" sign is placed closer to (the closer to the left column, the lower the score and the more favorable the situation in the team). The final score on the scale ranges from 10 (the most favorable atmosphere) to 80 (the most unfavorable).

Practical work 3

Sports team cohesion

Instructions. Read each question carefully and highlight the answer that best matches your opinion.

1. *How would you rate your membership in the team?*

1) I feel like a member of a team, part of a team (5)
2) Participate in most activities (4)
3) I participate in some activities and do not participate in others (3)
4) I don't feel like I'm a member of the team (2)
5) I train separately from other team members (1)
6) I don't know, it's difficult to answer (1)

2. *Would you move to train for another team if the opportunity presented itself?*

1) Yes, I would really like to go (1)
2) More likely to switch than stay (2)
3) I don't see any difference (3)
4) Most likely, he would remain on his team (4)
5) I would really like to stay on my team (5)
6) I don't know, it's hard to say (1)

3. *Relationships between athletes on your team?*

A.During training:

1) Better than most teams (3)
2) About the same as most teams (2)
3) Worse than most teams (1)
4) Don't know (1)

B. At competitions:

1) Better than most teams (3)
2) About the same as in other teams (2)
3) Worse than most teams (1)
4) Don't know (1)

B.Outside of training and competition:

1) Better than most teams (3)
2) About the same as in other teams (2)
3) Worse than other teams (1)
4) Don't know (1)

4. *Relationship between athletes and coach?*

1) Better than most teams (3)
2) About the same as most teams (2)
3) Worse than most teams (1)
4) Don't know (1)

5. *Attitude to work in training and competitions*

1) Better than most teams (3)
2) About the same as most teams (2)
3) Worse than most teams (1)
4) Don't know (1)

The athlete chooses one of the answers offered to him for each question, for which he is given a certain point (in brackets). The final score is obtained by summing up the individual scores of all team members and finding the arithmetic mean. Team cohesion ranges from 7 (very unfavorable atmosphere) to 25 (very favorable). The final scores are analyzed to identify athletes with extreme scores, and the distribution of responses to each question is then reviewed to highlight the most serious problems in the team.

The “psychological atmosphere in the team” scale and the group cohesion index are used to monitor intra-collective relationships in the team and increase:

1) the effectiveness of competitive activity by optimizing the socio-psychological conditions for the preparation and performance of athletes;

2) the level of educational work in the team as a result of creating the most favorable situations and environment.

Psychological compatibility and workability. Psychological compatibility is a decisive factor in the ability of athletes to work together in group activities. Completing squads for acrobatics, badminton, rowing, basketball, etc. is carried out in most cases according to physical and technical data, and the psychological factor is not always taken into account. Therefore, in these sports there is often a turnover of playing compositions, instability of game interaction, low performance, a long time to learn exercises, etc.

Thus, performance indicators, for example, in pair acrobatics, are:

1) stability of execution of group elements;
2) duration of learning new exercises;
3) workability of partners in the “srasov” test.

Psychological compatibility in group acrobatics presupposes:

1) according to the properties of nervous processes - a combination of average levels of strength, mobility, balance;

2) according to indicators of personal anxiety - various combinations of moderate and low indicators of personal anxiety;

3) according to the characteristics of "extraversion-introversion" - a combination of extrovert-introvert;

4) according to the characteristics of rationality-irrationality - a combination of homogeneous characteristics (rational-rational);

5) according to the criteria of "ethics-logic" - the presence of an ethical athlete with an introverted orientation;

6) by combination of role positions - leader-follower (e);

7) according to the perception of time - the minimum discrepancy in the assessment of the time interval (10 seconds) is 1.2 s.

In other sports, such as basketball, compatibility indicators will be different.

To diagnose compatibility and workability, below are two methods that a coach can use.

Practical work 4

Psychological compatibility and workability

1. "Srasov" test

Instructions. The partner is offered a questionnaire, which he fills out for his partner. For each question, choose one of the answers: "yes", "perhaps yes", "no".

Partner 1	Partner 2
1. He does it right	1. He empathizes with others when the team is doing less well.
2. He completes the work on time without delaying others.	2. He comes to the rescue when the overall work is not going well
3. He does the job efficiently (there is no need to redo anything after him)	3. He has a good sense of when a job is being done easily or poorly.
4. He understands his functions correctly	4. He is ready to help when needed.
5. He accurately evaluates the work of others.	5. He is quick to respond to requests for help.
6. He correctly assesses the quality of others	6. Easy to work with

*Key to the questionnaire.*The total number of points for each column is calculated, taking into account that the answers are scored as follows: "yes" - 2 points, "probably yes" - 1 point, "no" - 0 points. Compatibility and workability scale: 0-6 points - satisfactory compatibility and workability; 7-9 points - good; 10-12 points - excellent.

Practical work 5

Diagnostics of interpersonal relationships

Diagnostics of interpersonal relationships in the "coach-athlete" system

Instructions. Read each of the statements carefully. If you think that it is correct and corresponds to your relationship with the coach, then write "yes," but if it is incorrect, then "no."

1. The coach knows how to accurately predict the results of his students.
2. I find it difficult to get along with the coach.
3. The coach is a fair person.
4. The coach skillfully guides me to the competition.
5. The coach clearly lacks sensitivity in his relationships with people.
6. The coach's words are law for me.

7. The coach carefully plans his work with me.
8. I'm quite happy with the coach.
9. The coach is not demanding enough of me.
10. A coach can always give reasonable advice.
11. I completely trust the coach.
12. The coach's assessment is very important to me.
13. The trainer basically works according to a template.
14. Working with a trainer is a pleasure.
15. The coach pays little attention to me.
16. The coach, as a rule, does not take into account my individual characteristics.
17. The coach doesn't feel my mood well.
18. The coach always listens to my opinion.
19. I have no doubt about the correctness and necessity of the methods and means that the trainer uses.
20. I won't share my thoughts with the coach.
21. The coach punishes me for the slightest offense.
22. The coach knows my strengths and weaknesses well.
23. I would like to become like a coach.
24. My coach and I have a purely business relationship.

Each question that matches the key is worth 1 point.

- The Gnostic component includes questions: 1, 4, 7, 10, 13, 16, 19, 22 (numbers with a "-" sign mean the answer is "no", the rest are "yes".
- The emotional component includes questions: 2, 5, 8, 11, 14, 17, 20.
- The behavioral component includes questions: 3, 6, 9, 12, 15, 18, 21, 24.

The arithmetic average score makes it possible to present a kind of generalized "portrait" of the coach, created by his team, for each component and for the final indicator. The higher the score, the more favorable the attitude towards the coach on the part of his students.

Practical work 6

Diagnostics and self-assessment of the pre-launch state

1. Diagnostics of the pre-launch state.

To ensure successful performance at sports competitions, it is necessary to know the nature of the athlete's pre-start state. Knowing the athlete's condition, the teacher can apply means and methods to optimize it and bring it to a state of combat readiness.

Many different methods are used to diagnose the pre-launch state. Here are a few of them that coaches and physical education teachers can easily use when putting up various teams to participate in competitions (B.A. Vyatkin, 1981).

Observation method behind the external manifestations of the athlete. The emotional mental state of an athlete can be expressed externally and includes external expressive movements, various bodily manifestations, and changes of a humoral nature. In order to use this method, long-term observations of athletes in competitions and comparison of the results of their performances are necessary.

Method for measuring maximum muscle effort (dynamometry). This method allows us to judge the athlete's ability to mobilize his strength. The athlete is given the task of squeezing the dynamometer with maximum force three times, the average value is taken and compared with his maximum force (background, identified in classes). An increase in the indicator before the start by 2-4 kg from the background is considered as an indicator of the state of "combat readiness"; a decrease by 3-4 kg indicates apathy.

Method for measuring short time intervals. Using this method, the ability of subjective counting is determined, which, under the influence of increased excitation, reveals a tendency

to underestimate it (shortening), and with the development of the inhibition process, to overestimate it (lengthen). The subject is given the task of starting a regular stopwatch and stopping it without looking after 10 seconds have passed.

A shortening of the usual assessment of a period of time within 0.5-1.5 seconds characterizes the optimal neuropsychic stress corresponding to the state of combat readiness. A shortening of more than 1.5 seconds indicates pre-launch fever. Overestimating a 10-second interval by 1.5-2 seconds or more indicates apathy.

Heart rate measurement (heart rate). This method is available not only to the teacher, but also to every participant in the competition. It is necessary to identify the heart rate over the course of several competitions, comparing it with the results of the participant's performance at the competition with his external manifestations, with his report on the pre-start state, his sensations. In this way, the zone of optimal heart rate corresponding to the state of combat readiness is determined. Each athlete must know these boundaries in order to independently determine the nature of the pre-start state.

2. *Self-assessment of pre-launch state*

It is important for both the athlete and the coach to know the subjective state of an athlete based on his assessment of his sensations, feelings, and thoughts in order to correct one or another component of the state. To determine the severity of each component of the condition and the condition as a whole, a questionnaire with the following content is proposed.

*Instructions.*Read each statement and mark the answer that best matches your current situation.

1. How easily and freely do you move?
   A)more than usually
   B) as usual
   C)less than usual
2. How do you rate your mood?
   A)better than usual
   B) as usual
   C)worse than usual
3. How do you imagine your tactical action plan for the upcoming competitions?
   A)better than usual
   B) as usual
   C)worse than usual
4. How easily and freely do you breathe?
   A) better than usual
   B) as usual
   C) worse than usual
5. How do you assess your emotional state?
   A) better than usual
   B) as usual
   C)worse than usual
6. How much do you think about what the outcome of the competition will be?
   A) more than usually
   B) as usual
   C)less than usual
7. How do you rate the stability of your technique?
   A)higher than usual
   B) as usual
   C)lower than usual
8. How eager are you to participate in a future competition?
   A)more than usually
   B) as usual

C)lower than usual

9. Do thoughts about competing in competitions bother you?
   A)more than usually
   B) as usual
   C)less than usual
10. How do you evaluate the sense of balance in your movements?
   A)better than usual
   B) as usual
   C)worse than usual
11. Are you satisfied with your relationship with your coach?
   A)more than usually
   B) as usual
   C)less than usual
12. How do you assess your chances of success in the upcoming competition?
   A)higher than usual
   B) as usual
   C)lower than usual
13. How do you feel your heart working?
   A)less than usual
   B) as usual
   C)more than usually
14. Are you satisfied with your relationships with the people closest to you?
   A)more than usually
   B) as usual
   C)less than usual
15. How able are you to suppress the thought of possible failure in competition?
   A)more than usually
   B) as usual
   C)less than usual
16. How do you feel in your stomach and intestines?
   A)more than usually
   B) as usual
   C)less than usual
17. Do people around you get on your nerves?
   A)more than usually
   B) as usual
   C)less than usual
18. Do you think a lot about upcoming competitions?
   A)more than usually
   B) as usual
   C)less than usual
19. How would you rate your sense of coordination of your movements?
   A)better than usual
   B) as usual
   C)worse than usual
20. Are you confident?
   A)more than usually
   B) as usual
   C)less than usual
21. Do you think about your rivals?
   A)more than usually
   B) as usual

C)less than usual

22. How “fit” do you feel?
A)better than usual
B) as usual
C)worse than usual

23. How competitive do you feel?
A)more than usually
B) as usual
C)less than usual

24. How attentive are you?
A)more than usually
B) as usual
C)less than usual

25. How do you perceive your “sports feeling” (water, equipment, distance, etc.)?
A)better than usual
B) as usual
C)worse than usual

26. How calm are you?
A)more than usually
B) as usual
C)less than usual

27. Do you think a lot about what other people expect from you in upcoming competitions?
A)more than usually
B) as usual
C)less than usual

28. What was your appetite today?
A)better than usual
B) as usual
C)worse than usual

29. How anxious are you about the upcoming competition?
A)more than usually
B) as usual
C)less than usual

30. How important do you think the upcoming competitions are?
A)more than usually
B) as usual
C)less than usual

Processing the results: Physical component, questions: 1, 4, 7, 10, 13, 16, 19. 22, 25, 28; Emotional component, questions: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29; Cognitive component, questions: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30.

Answers A are worth 3 points;

Answers B are worth 2 points:

Answers C are worth 1 point.

The sum of points for each component is found. The maximum sum of each component is 30 points, the minimum is 10 points. The higher the sum of points, the more formed the component.

Practical work 7

Athlete's attitude towards the upcoming competition

1. *“Attitude to the upcoming competition” scale.*

The scale consists of 28 judgments to which the athlete must answer “yes” or “no.” The survey is conducted individually. Each athlete is given a questionnaire and questionnaire to answer.

Instructions. Visualize the upcoming competition as vividly as possible and answer each of the given judgments. If you agree, put the answer “yes”; if you disagree, put the answer “no”.

1. I'm ready to show good results.
2. I am better prepared for these competitions than my competitors.
3. I want to show good results in these competitions.
4. I'm afraid of letting the team down.
5. Physically I am well prepared for these competitions.
6. There will be many equal opponents at these competitions.
7. This is a very important competition for me.
8. I currently have a strained relationship with my coach.
9. I am in good athletic shape.
10. I don't know my opponents well.
11. A lot will be decided for me at these competitions.
12. Conflicts with teammates prevent me from properly preparing for the upcoming competitions.
13. I am confident that I will be able to complete the task set before me in these competitions.
14. I'm not afraid of my opponents.
15. I think it will be a difficult competition.
16. My successful performance in these competitions is important for the whole team.
17. I am pleased with the result of the last competition.
18. At the upcoming competitions I will have “inconvenient” opponents.
19. It is very important for me to perform well in these competitions.
20. It seems to me that my teammates don’t believe in my success.
21. I am confident in my abilities.
22. I have already won against my opponents.
23. I constantly think about upcoming competitions.
24. At these competitions I am afraid of letting my coach down.
25. Technically I am well prepared for the upcoming competitions.
26. Among my rivals there are those whom I don’t know at all.
27. I'm looking forward to the upcoming competitions.
28. The coach highly appreciates my readiness for these competitions.

Key to the questionnaire:

No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Yes			+	+		+	+	+		+	+	+		
No	+	+			+				+				+	+
No.	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Yes	+	+		+	+	+			+	+		+	+	
No			+				+	+			+			+

Each question on the OPS scale that matches the key is scored 1 point. Processing of the survey protocol is carried out using the key of “working” answers for each of the components. As a result, 4 indicators and a final index are obtained. The higher the indicator, the more “unfavorable” the athlete’s attitude towards the competition.

1. Confidence indicator - “can I do it” - questions: 1, 5, 9, 13, 17, 21, 25. High indicators mean: lack of confidence in one’s abilities; lack of desire to perform; unrealistic implementation of assigned tasks, etc.; 7 points - the athlete subjectively believes that he is not ready for competition; 0 points - high readiness.

2. Perception of the capabilities of rivals - “can rivals” - questions: 2, 6, 10, 14, 18, 22, 26. Comparison of one’s capabilities with the capabilities of rivals. 7 points - high assessment of the opponents’ readiness; 0 points - low assessment of the opponents' readiness.

3. An indicator of the desire to participate in the competition and the significance of the competition - “do I want to” - questions: 3, 7, 11, 15, 19, 23, 27. 7 points - high subjective significance and a great desire to perform. 0 points - low importance and lack of desire to compete.

4. Subjective perception of other people’s assessment of the athlete’s capabilities - “can I from the point of view of other people (coach, teammates)” - questions: 4, 8, 12, 16, 20, 24, 28. 0 points - high score. 7 points - low.

Return questions: 1, 2, 5, 9, 13, 14, 17, 21, 22, 25, 28. Answers “no” are worth one point. The rest are direct questions. Answers “yes” are worth one point.

Typically, this OPS scale is used in combination with other techniques, in particular with the reactive anxiety scale. In this case, the coach can control both the attitude towards the upcoming competition and the level of pre-competition anxiety.

TOPIC 4. METHODS OF RESEARCH AND EVALUATION OF THE EFFECTIVENESS OF PHYSICAL EXERCISE TECHNIQUES

The effectiveness of mastering a sports technique (or the effectiveness of a technique) of a particular athlete is the degree of its proximity to the most rational option. The effectiveness of technology (as opposed to rationality) is a characteristic not of one or another version of technology, but of the quality of mastery of technology. Depending on how a rational technique is defined (model, standard), three groups of indicators of its effectiveness are distinguished.

1. Absolute efficiency of technology. The recorded values are compared with reference values selected on the basis of biomechanical, physiological, psychological and aesthetic criteria. May be assessed:

• uniformity and straightness of movement of a person, a projectile;
• dynamics of projectile speed along the entire trajectory;
• distance covered per cycle (step, stroke, lay);
• solving a motor problem (in games, martial arts).

2. Comparative effectiveness of technology. The performer's technique is compared with that of a highly qualified athlete (but this is unacceptable in games and martial arts). Can be compared:

• biomechanical indicators;
• number of accurate passes, goals scored, etc. in a series of games.

2. *Implementation efficiency of technology*. The shown result is compared with the predicted (proper) result for the existing level of physical fitness or with the result in the control exercise. The smaller the difference, the more effective the technique. The proper result can be determined:

• using a mathematical model (regression equation);
• by the duration of solving a motor task under different conditions;
• by the number of successfully performed techniques.

Practical work 1

Determining the comparative effectiveness of hurdle running techniques

Biomechanical analysis of hurdle running technique

The literature contains quantitative data on some indicators of the technical skill of qualified hurdlers (Table 11).

Table 11 - Indicators of 110 m hurdle technique (according to V.V. Mehrikadze et al., 2008)

Distance from the take-off point to the barrier, m	2.10-2.25
Distance from barrier to landing site, m	1.04-1.45
Distance from the barrier to the highest point of the body's central gravity,	0.14-0.38
Angle of torso in position over the barrier, degrees	30-42
Torso angle upon landing, degrees	23-27

Goal of the work. Create an idea of determining the comparative effectiveness of physical exercise techniques based on biomechanical indicators.

Initial data.

The results of the biomechanical analysis of the hurdle running technique of FPhCS tudents who are not involved in athletics (Table 12).

Table 12 - Indicators of hurdle running technique among FPhCS students when running through 2 low (80.0 cm) barriers and their close arrangement (8.00-8.25 m)

Distance from the take-off point to the barrier, m	Distance from barrier to landing site, m	Distance from the barrier to the highest point of the WCTC, m	Angle of torso over the barrier, degrees	Torso angle upon landing, degrees
1.37	0.62	0.37	16	12
1.36	0.65	0.37	16	12
1.34	0.54	0.38	16	10
1.37	0.56	0.39	16	11
1.46	0.60	0.41	18	11
1.35	0.53	0.38	16	10
1.41	0.70	0.39	17	13
1.37	0.64	0.38	16	12
1.35	0.62	0.37	16	12
1.39	0.68	0.38	17	13
1.38	0.65	0.35	17	12
1.43	0.67	0.39	25	13
1.37	0.72	0.37	16	19
1.42	0.59	0.40	17	11
1.45	0.76	0.39	29	24
1.35	0.64	0.32	16	12
1.38	0.61	0.38	17	12
1.39	0.62	0.39	17	12
1.36	0.56	0.38	16	11
1.39	0.74	0.37	17	20
1.40	0.71	0.38	17	13
1.40	0.73	0.38	17	14
1.34	0.58	0.32	16	11
1.37	0.59	0.34	16	11

Progress.

1. Calculate the average values (X), standard deviation (S) and coefficient of variation (V) of the analyzed technical indicators among students.

2. Indicate whether the group of students is homogeneous or not for each of the analyzed indicators.

3. Describe the differences in technical skill indicators among hurdlers of various qualifications.

Practical work 2

Determination of the implementation efficiency of the shot put technique using a mathematical model

Math modeling.

Using mathematical models, it is possible to reliably determine the implementation efficiency of a particular performer's technique - the ratio of the physical and technical readiness of the student. A connection was revealed between sports results in the shot put (Y) and results in the bench press (x1), squats with a barbell on the shoulders (x2), standing shot put (x3), standing high jump (x4), overhead shot throw back (x5):

$$Y1 = 7.455 + 0.010x1 + 0.028x2, \quad (1)$$

$$Y2 = 0.252 + 0.953x3 + 0.023x4 - 0.0001x5. \quad (2)$$

Technical readiness is assessed using as a criterion the difference between the actual and calculated results in the shot put (Table 13)

Table 13 - Evaluation of the effectiveness of the shot put technique

Yactual — Ycalc.	>1.65 m	0—1.65 m	0—1.65 m	< -1.65 m
efficiency	excellent	good	average	Bad

*Goal of the work.*Learn to evaluate the implementation effectiveness of physical exercise techniques using a mathematical model.

Initial data.

Multiple regression equations relating the running shot put result to test results - see formulas 1 and 2.

Table for evaluating the effectiveness of the shot put technique - see table. 13. Test results (Table 14).

Table 14 - Testing data and actual results in the shot put (according to M.A. Kaimin, 1981)

No.	X1, kg	X2, kg	Heh, m	X4, cm	X5, m	*Y*actual, m
1	2	3	4	5	6	7
1	140	182	12.96	59	15.59	13.96
2	140	182	14.10	60	14.84	15.60
3	140	182	13.80	53	16.51	13.73
4	140	182	13.10	53	15.13	12.70
5	169	220	11.62	53	14.12	13.61
6	169	220	13.53	59	16.01	15.31
7	169	220	12.80	53	16.14	15.92
8	169	220	13.71	60	14.24	16.99
9	115	146	13.61	58	14.90	14.38
10	115	146	11.83	55	15.07	11.03
11	115	146	12.86	58	16.00	12.35
12	115	146	12.90	59	14.99	12.89
13	128	163	13.75	61	16.52	12.57
14	128	163	13.84	52	15.38	14.07
15	128	163	12.90	59	15.24	14.97
16	128	163	11.52	54	14.90	11.66
17	155	192	14.14	58	16.21	14.38
18	155	192	11.54	52	15.24	14.30
19	155	192	12.79	53	16.28	14.40
20	155	192	12.79	53	16.28	14.98
21	155	192	14.22	53	15.15	16.11

Progress.

1. Substitute the testing data into equations 1 and 2, and calculate the expected results in the running shot put UraschA and Urasch.:-
2. Calculate the differences between the actual O'"act.) and expected (Calc.) results.
3. The resulting differences are compared with the data in Table. 1.
4. Draw a conclusion about the running shot put technique of this performer.
5. Answer the question: are significant differences possible in assessing the effectiveness of the shot put technique when using this mathematical model?

Practical work 3

Determination of the implementation efficiency of high jump technique

Technical efficiency coefficient.

In high jumps, the technical efficiency coefficient (^) can be used to assess the implementation efficiency of a technique:

(3)

where W is the motor jumping potential; h - excess of the bar over the length of the body, m. According to V.M. Dyachkov (1972), if the height overcome is greater than the body length, the technical efficiency should approach 12; the lower this indicator, the higher the implementation efficiency of the technique. If the height overcome is less than the length of the jumper's body, then the value of the technical efficiency coefficient will be negative, but at the same time, the lower the indicator, the higher the implementation efficiency of the technique.

Motor potential is calculated using the formula:

$$W = L*foTH.*H2*k, \quad (4)$$

where L is the length of the jumper's body, m; fi^. - relative foot strength; H - height of standing high jump without swinging arms, m; k is the ratio of the length of the legs to the length of the body (proportionality coefficient).

$$^{To}=G, \quad (5)$$

$$^{L}2$$

where L1 - leg length, m; L2 - body length (seated body length), m.

*Goal of the work.*Learn to evaluate the implementation effectiveness of physical exercise techniques using a mathematical model.

Equipment.

High jump pit, racks, bar, height meter. Scales. Height meter. Cloth tape measure or measuring tape. Bench leg press training device.

Progress.

1. Prepare a form to complete the work:

Determination of the implementation efficiency of technology in high jumps

Index	Magnitude
Standing body length, m	
Sitting body length, m	
Body weight, kg	
Strength of plantar flexion of the foot, kg	
Standing high jump without swinging arms, m	
Running high jump using the Fosbury flop method, m	
Running high jump using the "stepping over" method, m	
Leg length, m	
Proportionality coefficient, relative units	
Relative foot strength, rel. units	
Motor potential, rel. Units	
Exceeding the bar over the body length ("Fosbury flop"), m	
Technical efficiency coefficient, rel. units	
Exceeding the bar over the body length ("stepping"), m	
Technical efficiency coefficient, rel. units	

2. Fill in the form

• measure the strength of plantar flexion of the foot on a training device in a supine position, with the leg straightened at the knee;

• standing high jump without swinging arms is measured according to Abalakov.

3. To compare the implementation efficiency of the high jump technique using the "Fosbury flop" and "stepping over" methods.

Practical work 4

Approximate assessment of the implementation efficiency of the running shot put and hurdling technique

Comparing the sports result with the result in the control exercise.

In some cases, the implementation effectiveness of a technique can be quickly determined by comparing a sports result with the result in a control exercise. For example, in jumping shot put, a technique in which the result in the put is equal to the result in the shot throw from below can be considered good. In hurdling, the technique of overcoming a barrier can be assessed by the difference in time to overcome smooth and hurdle distances.

*Goal of the work.*Create an idea of an express method for determining the implementation effectiveness of a physical exercise technique.

Equipment.

Kernel, tape measure, starting blocks, barrier, stopwatch.

Progress.

1. Prepare a form to complete the work.

Approximate assessment of the implementation efficiency of the running shot put and hurdling technique

Run 30, s	Running 30 m, s	At, s	Shot put, m	Shot throw from below to	AS, m

2. Do a warm-up.
3. Do the exercises, fill out the table.
4. Compare the technique of several subjects.

KNOWLEDGE CONTROL SECTION

Tests in the academic discipline "Modern control technologies in the practice of physical culture and sports"

1. Control is aimed at

– monitoring the athlete's condition.

– **collection, evaluation and analysis of the necessary information about the actual progress of the training process and the athlete's condition.**

– athlete training process.

– targeted management of the training process.

2. Control in the training of athletes should include assessment

– training and competitive loads.

– the athlete's condition and preparedness.

– sports results of athletes

– **all of the above.**

3. Load control involves assessing the following characteristics:

– specialization of the load.

– coordination complexity of the load.

– direction and magnitude of the load.

– **all of the above.**

4. Physical fitness monitoring includes measuring

– somatometric indicators.

– functional indicators.

– **level of development of strength, speed, endurance, flexibility, agility and related abilities.**

– level of health.

5. There are functional tests

– single-stage and two-stage.

– two-moment and three-moment.

– **single-stage, two-stage and three-stage.**

– two-moment, three-moment and four-moment.

6. Martinet's sample is

– **20 squats for 30 seconds.**

– 30 squats for 30 seconds.

– 30 squats for 60 seconds.

– 60 squats for 60 seconds.

7. Stange's test is

– holding your breath while exhaling while sitting.

– **holding your breath while inhaling while sitting.**

– holding your breath while exhaling while lying down.

– holding your breath while exhaling while standing.

8. Genchi test is

– **holding your breath after exhaling while sitting.**

– holding your breath while inhaling while sitting.

– holding your breath after exhaling while lying down.

– holding your breath while exhaling while standing.

9. Determination of maximum oxygen consumption (MOC) characterizes

– the amount of general physical fitness.

– **the value of general physical performance.**

– the amount of general technical readiness.

– the value of general mental performance.

10. PWC170 is used for

– **determination of physical performance.**

– determination of general physical fitness.

– general mental performance.

– morbidity level.

11. Letunov's test includes

– 20 squats, 3-minute running in place at a pace of 180 steps per minute.

- **20 squats, 15 seconds of running in place at a maximum pace, 3 minutes of running in place at a pace of 180 steps per minute.**

– 15 seconds of running in place at a maximum pace, 3 minutes of running in place at a pace of 180 steps per minute.

– 20 squats, 15 seconds of running in place at maximum pace.

12. The endurance coefficient (EC) characterizes

– **functional state of the cardiovascular system.**

– functional state of the respiratory system.

– functional state of the digestive system.

– functional state of the nervous system.

13. The principles of psychodiagnostics are

– The principle of maintaining secrecy, the principle of scientific validity of psychodiagnostic methods, the principle of non-damage, the principle of the effectiveness of proposed recommendations.

– **The principle of maintaining secrecy, the principle of scientific validity of psychodiagnostic methods, the principle of non-damage, the principle of objectivity of conclusions from the results of psychodiagnostics, the principle of the effectiveness of proposed recommendations.**

– The principle of maintaining secrecy, the principle of non-harm, the principle of objectivity of conclusions from the results of psychodiagnostics, the principle of the effectiveness of proposed recommendations.

– The principle of maintaining secrecy, the principle of scientific validity of psychodiagnostic methods, the principle of non-damage, the principle of objectivity of conclusions from the results of psychodiagnostics.

14. When conducting psychodiagnostics, the following moral and ethical standards must be observed:

– 1. You cannot subject a person to a psychological examination without his consent. 2. The test taker does not have the right to know the results of psychodiagnostics. 3. When testing minor children, their parents have the right to know the results. 4. When testing in competitive selection or when applying for a job, a person has the right to know the purpose of testing and possible conclusions based on its results.

– **1. You cannot subject a person to a psychological examination without his consent. 2. The test taker has the right to know the results of psychodiagnostics. 3. When testing minor children, their parents have the right to know the results. 4. When testing**

in competitive selection or when applying for a job, a person has the right to know the purpose of testing and possible conclusions based on its results.

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15. Monitoring technical readiness, or technical mastery (TM), consists of assessing whether

– **what the athlete can do and how he performs the mastered movements.**

– what an athlete can do and how he breathes.

– what an athlete can do and how he eats.

– what an athlete can do and how he recovers.

16. There are two main methods of monitoring TM:

– **visual and instrumental.**

– documentary and metric.

– nominal and figurative.

– basic and arbitrary.

17. The volume of equipment is determined

– the total number of actions that an athlete performs during competitions.

– the total number of actions that an athlete performs throughout his entire sports career.

– the total number of actions that the athlete performs during training sessions.

– **the total number of actions that an athlete performs during training sessions and competitions.**

18. The training volume of technical techniques indicates the potential capabilities of athletes.

– level of physical fitness.

– level of physical development.

– the functional state of the athlete.

19. The versatility of an athlete’s technical preparedness is determined

– success in competitions.

– number of victories in competitions.

– **the degree of variety of motor actions that the athlete masters**.

– the ability to master new motor actions.

20. The most effective movement technique is one that best implements

– athlete's functional potential.

– **motor potential of the athlete.**

– athlete's mental potential.

– psychological potential of an athlete.

21. There are two main directions in monitoring the mastery of movements:

– assessment of the beauty and sustainability of technology.

– assessment of mobility and stability of equipment.

– assessment of stability and mobility of equipment.

– **assessment of the stability and sustainability of equipment.**

22. Control of tactical skill is

– **in assessing the appropriateness of an athlete's (team's) actions aimed at achieving success in sports competitions.**

– in assessing the professionalism of an athlete's (team's) actions aimed at achieving success in sports competitions.

– in assessing the assertiveness of an athlete's (team's) actions aimed at achieving success in sports competitions.

– in assessing the appropriateness of an athlete's (team's) actions aimed at achieving success in training sessions.

23. Tactical (or tactical-technical) actions are based on

– technical knowledge, as well as the ability to assess situations that arise during a sports match.

– theoretical knowledge, as well as the ability to assess situations that arise during a sports match.

– **tactical knowledge, as well as the ability to assess situations that arise during a sports match.**

– confessional knowledge, as well as the ability to assess situations that arise during a sports match.

24. Ruffier's test is used for

– **assessment of heart performance.**

– assessment of lung performance.

– assessment of brain performance.

– assessment of liver performance.

25. The degree of development of motor qualities is determined using two groups of tests:

– control and competition.

– simple and complex.

– **nonspecific and specific.**

– biomechanical and biochemical.

26. Non-specific tests are intended for

– **assessment of general physical fitness.**

– assessment of special physical fitness.

– assessment of the level of physical development.

– assessment of the level of mental preparedness.

27. Specific tests and used for

– assessment of general physical fitness.

– assessment of the level of physical development.

– **assessment of specific physical fitness.**

– assessment of the level of mental development.

28. The choice of tests to assess physical fitness largely depends on

– **types of sports, age, qualifications of athletes, structure of the annual and multi-year cycle of sports training.**

– types of sports, age, structure of the annual and multi-year cycle of sports training.

– age, qualifications of athletes, structure of the annual and multi-year cycle of sports training.

– structures of the annual and multi-year cycle of sports training.

29. The speed of recovery depends on

– physical development.

– technical readiness.

– duration of night sleep.

– **power and type of physical activity.**

30. To study the properties of temperament they use

– **G. Eysenck test.**

– Letunov's test.

– Ruffier's test.

– Genchi test.

Questions for self-control and control of master's students' knowledge:

1. Fundamentals of testing theory in the field of physical education and sports.
2. Features of control and pedagogical testing of physical development and preparedness.
3. Characteristics of methods of mathematical statistics.
4. The role of instrumental and hardware techniques in monitoring physical condition.
5. Assessment of the level of functional state of the cardiovascular system.
6. Assessment of the level of functional state of the respiratory system.
7. Monitoring the level of development of speed and speed abilities.
8. Monitoring the level of development of physical abilities.
9. The role of mathematical statistics methods in control methodology.
10. Types of control in the physical education system (stage-by-stage, current, operational).
11. Comprehensive monitoring of the level of physical development and preparedness in physical culture and sports.
12. Control of rationality, versatility, efficiency and effectiveness of tactics.
13. Monitoring load dynamics based on heart rate and other indicators. 14. Determination in percentage terms of the dynamics of test results.
15. The meaning and types of control in physical culture and sports.
16. Control of training and competitive loads of athletes.
17. Monitoring physical fitness during physical education and sports.
18. General characteristics of functional tests used in physical culture and sports.
19. Indications for functional tests.
20. Requirements for functional tests.
21. Absolute contraindications.
22. Testing of athletes - types of influences used during testing.
23. Psychodiagnostics of personality during physical education and sports: ethical aspects of psychodiagnostics, classification of diagnostic techniques.
24. Control of technical readiness.
25. Control of equipment volume.
26. Control of the versatility of technology.
27. Monitoring the effectiveness of equipment.
28. Control of technology mastery.
29. Monitoring the tactical readiness of athletes.
30. Control of tactical thinking.

AUXILIARY SECTION

Diagnostics of master's students' competencies

The curriculum of the specialty direction provides for a “credit” as the final certification of undergraduates in the academic discipline “Modern control technologies in the practice of physical culture and sports”.

Current diagnostics of competencies is carried out in points from 1 to 10. When assessing master's students' knowledge, grades of at least 4 (four) points are positive. For intermediate certification of master's students' mastery of knowledge, oral, written and oral-written forms, defense of an abstract, and a form of control using technical means are used. For ongoing monitoring of the quality of education of undergraduates studying on individual schedules, the following diagnostic tools are used:

- performing practical work;
- evaluation of submitted abstracts on class topics;
- provision of practical assignments completed by undergraduates on topics of missed classes;
- test.

Methodological recommendations for organizing and performing independent work

When mastering the academic discipline “Modern control technologies in the practice of physical culture and sports,” the time allotted for independent work is used by undergraduates to study topics assigned for independent study: completing research and creative tasks; preparation of messages, abstracts, presentations; performing practical tasks; taking notes of educational literature; compiling a review of scientific literature on a given topic. List of activities for independent work:

- studying, summarizing and taking notes of literary sources in preparation for practical classes;
- study of topics (issues) submitted for independent study;
- preparation of messages, thematic reports, abstracts;
- compiling a review of scientific literature on a given topic;
- carrying out control and pedagogical tests on the basis of educational institutions;
- participation in scientific and practical conferences;
- preparation for taking the test.

Control of independent work is carried out in the form of:

- evaluation of the oral response and presentation;
- checking abstracts, notes;
- individual survey.
- test.

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