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SCIENTIFIC AND METHODOLOGICAL PROBLEMS OF THE DEVELOPMENT OF THE NATIONAL SPORT OF WRESTLING

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Annotation
The article discusses the main scientific and methodological problems of training Greco-Roman style wrestlers. The author proposes a system for controlling the training process based on optimizing the parameters of technical actions and using special technical devices with feedback.

Keywords: management, system, training, technique, tactics, skill, highly qualified athletes, three-component training system, sports exercises, training process.

1. Currently, there is no doubt that the management of the system of training highly qualified athletes is a very complex form of intellectual activity, that the processes of competitions and preparation for them should be managed. To effectively manage the training and competitive processes of highly qualified wrestlers, it is necessary to solve the issues of improving the structure of organizational forms of management, choosing criteria for evaluating various aspects of athletes' fitness, using quantitative information with qualitative analysis of various characteristics of athletes' motor activity, etc.
2. A further stage in the development of a three-level system of training athletes is research related to the identification of patterns of connections of its elements. One of the aspects of research in this direction is the study of the interrelationships of physical qualities manifested in competitive conditions with technical skill, with the state of body systems, means and methods of implementing a specific technical action, taking into account the achieved level of physical fitness.
3. The implementation in practice of the above theoretical provisions is the three-component system of training in sports exercises set out below.
4. The analysis of literary sources and our research have shown that successful training in sports exercises is carried out with the obligatory fulfillment of the following three components:
5. Sufficient level of development of physical qualities of the athlete.
6. Perfect movement technique.
7. Rational use of the athlete's motor potential.

These components, individual for each athlete, are closely related to each other. Let's take a closer look at each of them.

With an insufficient level of development of physical qualities, an athlete is often unable to even begin to learn the exercise. So, for example, when performing a deflection throw in

Greco-Roman wrestling, an athlete should, when an opponent breaks away from the carpet, bend over, fall back, spending considerable effort at the same time. If an athlete is not able to do this, then it is too early for him to learn this technique, he must increase the level of speed and strength training and only then begin to learn this throw. Similarly, when performing a backflip from a place in the grouping, the gymnast must jump up from a place no lower than forty centimeters. Otherwise, with poor physical fitness, he will not be able to do a somersault. The above examples show that when learning sports exercises, an athlete must have a sufficient level of physical fitness that allows him to perform this exercise. This level is characterized by a threshold value of the degree of development of physical quality, which is most closely related to the result of the motor action being learned.

The degree of development of an athlete's physical qualities is usually determined by analyzing competitive activity, technical and tactical skills and the state of the body's systems based on the results of test exercises. A certain sequence of application of test exercises in the training process is recommended.

First, test exercises are identified that are most closely related to the result of the movement being learned. Next, the exercise that the athlete will be trained in is analyzed, and the characteristics of technical and tactical skill that are closely related to the result of the test exercises are recorded. Then the threshold values of these characteristics are revealed, below the values of which the sports exercise cannot be performed.

If an athlete has values of these characteristics above the threshold, then you can start learning this movement. If these characteristics have a value below the threshold, then a set of exercises is developed and applied in the training process to increase the value of the level of these characteristics, and you can start mastering the exercise you are learning only after the athlete reaches their threshold value.

These values were revealed on the basis of electromyographic studies (Fedorov V.L.). The sequence of inclusion in the work of muscles, the duration of their electrical activity and the relative strength of tension when performing techniques by an attacking wrestler was determined. The analysis of experimental materials showed that, for example, the execution of a deflection throw in Greco-Roman wrestling is accompanied by electrical activity of all the muscles studied. However, the specific gravity of the electrical activity of each muscle at different times is different.

The total level of muscle tension recorded in the standard position on the polydynamometer of our design was taken for 100%. When performing the techniques, this total level was compared with the recorded one. It turned out that against the background of significant muscle tension, the tension of the pectoralis major muscle (117.9%), the trapezius muscle (78.3%), the spine straightener muscle (95.6%) and the anterior tibial (80.6%) stands out. The predominant tension of these muscle groups in most cases is associated with the performance of the most critical moments of the studied technical actions of wrestling. For example, a significant strain of the pectoral muscle in a deflection throw characterizes the efforts of an attacking athlete when he presses the opponent's torso to his chest. The tension of the trapezius muscle and the spine straightener muscle is associated with the extension of the trunk during padding.

The analysis of electromyograms shows that in some cases, the most important elements of the reception are performed with muscle activity equal to or even exceeding the activity shown at maximum voltage on a dynamometer machine. This is due to the fact that the maximum tension of individual muscles in specific, familiar conditions is higher than on a dynamometer machine. In addition, the task of maximum muscle tension in isolated movements occurred nevertheless in artificial conditions and was not accompanied by appropriate emotional arousal. Apparently, the best means of influencing special muscle groups are still the technical actions themselves or special exercises that are as close to them as possible.

It follows from this that the functional training of martial artists should solve two main tasks: improving the energy supply of muscles and the development of innervation of muscle contractions. The model of functional training of martial artists consists of these two main components. The endurance component is primarily designed to improve the energy supply of muscles and consists of aerobic, aerobic-anaerobic, anaerobic-glycolytic and anaerobic-alactate orientation of motor activity. The speed-strength component is aimed at the development of innervation of muscle contractions and consists of sections of intermuscular and intramuscular coordination, the speed of the pulse and anabolic hormones.

Of particular importance when registering threshold characteristics is the reliability of the results of test exercises. Thus, tests performed insufficiently technically and (or) with insufficient use of the athlete's motor capabilities do not accurately reflect the level of development of the analyzed motor qualities and cannot be effectively used in the training process of teaching sports exercises.

It is necessary to teach sports exercises on the basis of perfect technique, which determines their performance with a good result. An athlete, even with a high level of development of physical qualities, but with imperfect technique, will perform a learned movement with a low result. Perfect technique in this case is understood as the performance of a learned movement with characteristics (closely related to the result of the exercise) that have an optimal value, which determines its performance with a high result.

Based on these studies and our 16-year experience as an athlete and coach, the following system of training and improvement of sports exercises with perfect movement technique was proposed. First, the characteristics of several variants of the studied sports exercise are recorded. Further, from among these characteristics, those that have the greatest connection with the result of the exercise are selected. From these characteristics, the characteristics of exercises performed with insufficient use of the athlete's motor capabilities are discarded. The remaining characteristics are approximated by a polynomial of the second degree, the mathematical processing of which makes it possible to find the optimal value of the characteristic at which the sports exercise is performed with the highest result. After that, the training process of teaching a sports exercise is carried out with a message to the athlete after each attempt of the actual and optimal value of the characteristic, and he strives to perform the exercise with optimal parameters.

The method of determining the optimal parameters of sports exercises is considered in detail in our work. Performing sports exercises with close to the maximum use of motor potential has its own characteristics. First of all, we note that highly effective sports motor actions should

be performed in most cases not with maximum, but with optimal use of motor capabilities, and in the decisive phase of movement, on which the result of the exercise as a whole depends. The degree of use of the motor potential of athletes is higher than in other parts of the motor action.

Optimal use here means the best, providing without harm to health, the tension of forces. Thus, when performing an upward jump, the maximum stress of forces determining the highest jump height will be optimal. At the same time, in marathon running, long-distance skiing and when performing other exercises that require great endurance from athletes, sometimes you can see how participants at the finish of the distance fall to the ground from fatigue, and in some cases the finish ends with a fainting state. It is obvious that in these cases, motor actions are performed with the utmost exertion of forces, at which significant damage can be done to the athlete's health. With such variants of the end of the exercise, the optimal tension of forces will be, at which a high result will be shown, but no damage will be done to the state of health, that is, in these cases, the optimal tension of forces should be lower than the maximum possible.

A review of the scientific and methodological literature and an analysis of the materials of their own research from the standpoint of performing motor actions with maximum use of the athlete's motor potential convince that sports exercises can be conditionally divided into three groups:

- the first group includes motor actions that can be performed repeatedly in the training process with extreme (or near-extreme) exertion of strength, especially in competition conditions, when athletic performance is the main condition for performing the exercise;
- the second group is characterized by the fact that the exercises should be performed with a lower, optimal, significantly different from the maximum, use of the motor capabilities of athletes, since the maximum strain of forces damages their health;
- the third group includes sports exercises that are performed with optimal use of forces, and the implementation of the main, decisive part of the movement - with the near-limit use of the motor capabilities of athletes (this group of exercises mainly includes attacking techniques in martial arts).

Let's consider the features of performing the first group of movements. Repeated performance of motor actions in the educational and training process and especially in competitions with the near-limit use of the motor capabilities of athletes is usually permissible in sports exercises in which the result is achieved with a stress of forces exceeding their threshold value (the threshold stress of forces is understood here as such a stress of forces at which it becomes possible to perform exercises). So, when training a barbell press from the chest, an athlete can repeatedly try to perform this movement. With an insufficient level of development of physical qualities, he does not get it until, through prolonged training, he manages to reach such a threshold level of strength training that will give him the opportunity to perform the exercise being trained.

Usually, such a performance of movements, even with the tension of forces close to the limit, is permissible - the athlete simply will not master this exercise. However, such training is allowed only with athletes who have reached a level of preparedness that allows them to master such an element. For an untrained athlete, such a strain of strength can lead to injury. Therefore,

such training should be carried out with careful medical supervision. At the same time, it is necessary to achieve an increase in the level of physical fitness of athletes, allowing them to repeatedly perform exercises with the near-limit use of motor potential.

Another type of movement that can also be repeatedly performed in training with a stress close to the limit is the performance of strength and speed-strength exercises to failure, as well as their performance with weights or resistance of the partner. For example, performing general developmental physical exercises: pull-ups on the crossbar for the number of times to failure, stops in the hang angle for a while, etc. Usually, performing such movements does not lead to injuries.

In connection with the above, it can be concluded that in a number of exercises (for example, in power movements, in exercises performed to failure, etc.), it is permissible to repeatedly perform the studied movements in the training process with the near-limit use of the motor capabilities of athletes. It does not harm health and is habitual for athletes with a sufficient level of development of physical qualities and the corresponding difficulty of the studied movements.

Let's consider improving the training of athletes based on improving the technical skills of martial artists.

In the technical skill of athletes, as in focus, the results of his physical, tactical and psychological training are concentrated. The main aspects of the athlete's skill are constantly brought into line with the features of the wrestler's technical arsenal as a implementing factor. Therefore, the study of the features of the process of their improvement in the light of the theory of complex dynamic systems and the search for new opportunities for this improvement occupies the main place in the system of training athletes.

The technology of determining the high or low level of technical and tactical skill of an athlete determines mainly the possibility of programming the training process and, accordingly, the growth of sports results. The limiting factor of this process is insufficient knowledge (assessment) of the reserve tactical and technical and physical capabilities of the athlete.

To answer this question, it is necessary to study the near-limit indicators for the main elements of wrestling in the conditions of competitive activity. It is in the conditions of the largest international competitions that an athlete shows his maximum (near-limit) physical capabilities, motivated by material, social, etc. incentives.

Constantly conducted research at the main competitions (World Championships, European, Russian, Olympic Games) allowed us to develop a technology for automated analysis of competitive activity of an athlete. At the same time, the main criterion for the selection and calculation of the leading elements of motor activity was taken into account their informativeness, reliability and reproducibility in the conditions of training activity.

Our long-term research has allowed us to identify and substantiate by methods of statistical analysis the significance of six elements of competitive activity: the reliability of protection - NZ; the effectiveness of technology - ET; average score - SB; attack interval - IA; variety of technology - RT and integral level of preparedness - T.

We present a refined methodology for determining and calculating these elements.

1. The interval of a successful attack (IUA) is the average time between the evaluated techniques. The Attack Interval (IA) is the average time between the estimated techniques and attempts.
2. Average score (SAT) - the ratio of the points won to all the techniques performed or the number of fights held.
3. Attack Efficiency (EA) - the ratio of points won to the sum of points won and lost.
4. Reliability of protection (NC) - the ratio of won technical actions (TD) to the sum of won and lost TD.
5. Preferential effectiveness (PR) - the ratio of the receptions won in the rack to the sum of all the receptions won (the efficiency of work in the rack and in the stalls).
6. Variety of equipment (RT) - the number of TD from different classification groups.

It is very difficult to determine competitive characteristics in the course of a duel - with a rapid alternation of attacking and defensive techniques in a fight, it is impossible to register all attacking and defensive techniques, the time between the execution of successive attacking techniques, etc. Therefore, in practice, video recordings of fights and computers for their calculation are usually used to identify competitive characteristics.

As can be seen from the analysis of the parameters of technical actions, the criterion of their mathematical calculations are mainly elements of tactical and technical skill. All this once again underlines the importance of this side of mastery in the integral representation of the specific activity of a wrestler in this type of martial arts. In addition, many years of research and extensive statistical material on the analysis of the largest competitions have allowed today to formulate and present the following initial positions of the elements of an athlete's motor activity for subsequent programming of training:

The first provision is the study of the reserve tactical, technical and physical capabilities of the athlete in the main elements of a competitive duel. This is a new position that allows you to see the perspective of an athlete in specific elements of his skill, as well as the level of this skill relative to rivals. These calculations are determined as a percentage, since according to Professor A.G.Dembo, "All indicators for which "due" values can be calculated should be expressed as a percentage of the due value. This expression allows us to judge the functional value of the systems."

The reserve capabilities of a martial artist are determined by comparing their "absolute near-definition" (100% indicator) at a given time with the elements of a competitive duel of a particular martial artist. As a result, it was revealed that in the largest international competitions, wrestlers not only in one or two elements of a competitive duel are approaching the "absolute limit". For example, a wrestler of the tempo type of fighting does not reach the "absolute definition", that is, his reserve capabilities in terms of, for example, the reliability of protection are 922%. According to the main characteristics of competitive activity, this indicator is at the level of 40%. Our calculations also allow us to have guidelines for the athlete's movement towards "near-determination", i.e. the ability to realistically predict the growth of skill and the development of physical qualities is manifested. In addition, it allows you to receive urgent information about the effectiveness of new sets of exercises being introduced into the training program focused on a specific element of his skill, and evaluate

the effectiveness of exercises. And, finally, to prevent breakdowns, overtraining in those elements of competitive activity in which the athlete approached the "near-definition".

The second position is that the use of six coefficients in the analysis of competitive activity makes it possible to solve several important problems of the development of wrestling in the world. In particular, to identify the types of wrestlers demonstrating spectacular wrestling, to evaluate the maximum and acceptable indicators of athletes' skill by these coefficients, to evaluate the selection system, the orientation of the training process in national teams, etc.

The third position is the study of compensatory mechanisms of motor activity. The study of the typology of athletes allowed us to come into contact with such a phenomenon as compensatory mechanisms of motor activity of a martial artist. An athlete who has achieved "near-determination" in the main element of a competitive duel, taking into account individual characteristics, finds additional reserves for further skill growth in other elements of a competitive duel.

The fourth position is modeling of competitive activity of an athlete in training conditions with the help of special stands. This stage of the study is necessary in order to transform the relative (percentage) indicators of competitive activity into temporal, power and spatial characteristics. In addition, the stand simulating competitive activity allows you to study and control this activity taking into account the individual characteristics of athletes, as well as to study any element of competitive activity in isolation in laboratory conditions.

The fifth provision is systematic control with the help of pedagogical and instrumental research methods and a system of training facilities for the growth of the technical skill of a wrestler (from a beginner to an Olympic Champion.), as a implementing factor, which is interconnected with all elements of a three-level training management system, will allow an athlete to accurately and gradually lead to the highest sporting results.

The results of the research have made a significant contribution to the theory of training Greco-Roman wrestlers, showing that the use of a coherent, theoretically sound and proven in practice control system of the training process based on the optimization of the parameters of technical actions and the use of special technical devices with feedback can lead to the elimination of the backlog of Russian wrestlers from foreign rivals.

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