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Ismatillo Ummataliyevich Tuxtanazarov
Ferghana state university
Teacher

Adhamjon Melibayevich Maxmutaliyev
Ferghana state university
teacher

SCIENTIFIC AND METHODOLOGICAL PROBLEMS OF WRESTLING DEVELOPMENT

Abstract: *The paper deals with the main scientific and methodological problems of training Greco-Roman style wrestlers. The author proposes a system for managing the training process based on optimizing the parameters of technical actions and using special technical devices with feedback.*

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

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Introduction

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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 competition processes of highly qualified wrestlers, it is necessary to solve the issues of improving the structure of organizational forms of management, selecting criteria for evaluating various aspects of the athletes 'fitness, using quantitative information with a qualitative analysis of various characteristics of the athletes' motor activity, etc.

A further stage in the development of the 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 relationship of physical qualities manifested in competitive conditions, with technical skill, with the state of the body systems, means and methods of implementing a specific technical action, taking into account the achieved level of physical fitness.

Implementation in practice of the above theoretical provisions is the three-component system of training in sports exercises described below.

Analysis of literature sources and our research have shown that successful training in sports exercises is performed with the following three components:

1. Sufficient level of development of physical qualities of the athlete.
2. Perfect movement technique.
3. Rational use of the athlete's motor potential.

These components, individual for each athlete, are closely related to each other. Let's look at each of them in more detail. With an insufficient level of development of physical qualities, the athlete is often unable to even begin to learn the exercise. So, for example, when performing a deflection throw in Greco-Roman wrestling, the athlete must break off the opponent from the carpet, bending, fall back, while spending considerable effort. If the 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 position in a group, the gymnast must jump up from a position no lower than forty centimeters. Otherwise, with poor physical training, he will not be able to do a somersault.

The above examples show that when learning sports exercises, the athlete must have a sufficient level of physical fitness to perform this exercise. This level is characterized by a threshold value of the degree of physical quality development that is most closely related to the result of the motor action being studied.

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

First, the test exercises that are most closely related to the result of the studied movement are identified. 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 identified, below the values of which the sports exercise cannot be performed.

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

These values were detected on the basis of electromyographic studies. 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, performing a deflection throw in Greco-Roman wrestling [1] is accompanied by electrical activity of all the studied muscles. However, the specific weight 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 polydinamometer of our design was taken as 100%. When performing techniques, this total level was compared with the registered level. It turned out that against the background of significant muscle tension, the tension of the large pectoral muscle (117.9%), the trapezius muscle (78.3%), the spine straightener muscle (95.6%) and the anterior tibial muscle (80.6%) is highlighted. The predominant tension of these muscle groups in most cases is associated with the implementation of the most important 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 trapezoid muscle and the spine straightener muscle is associated with the extension of the torso during the tipping.

Analysis of electromyograms shows that in some cases, the most important elements of the reception are performed when the activity of the muscles is equal to or even greater than the activity shown at the maximum voltage on the 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 under artificial conditions and was not accompanied by appropriate emotional arousal. Apparently, the best means of influencing special muscle groups is still the technical actions themselves or special exercises that are as close to them as possible.

It follows that the functional training of martial artists [2] 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 intended for improving the energy supply of muscles and consists of aerobic, aerobic-anaerobic, anaerobic-glycolytic and anaerobic-alactate orientation of motor activity. The speed-power 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.

The reliability of test exercise results is of particular importance when registering threshold characteristics. 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 can not be effectively used in the training process of teaching sports exercises.

It is necessary to teach sports exercises on the basis of a perfect technique that makes them perform with a good result. An athlete, even with a high level of physical development, but with an imperfect technique, will perform a learned movement with a low result. In this case, perfect technique is understood as performing a learned movement with characteristics (closely related to the result of the exercise) that have an optimal value that 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 improving sports exercises with perfect movement techniques was proposed. First, the characteristics of several variants of the sports exercise being studied are recorded. Then, from

among these characteristics, the ones that have the greatest relationship 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 second-degree polynomial, whose mathematical processing 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 training a sports exercise is performed with a message to the athlete after each attempt of the actual and optimal value of the characteristic, and he seeks to perform the exercise with the optimal parameters.

The method of determining the optimal parameters of sports exercises is discussed in detail in our work. Performing sports exercises with close to 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 the maximum, but with the optimal use of motor capabilities, and in the decisive phase of the 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 is understood as the best, providing without harm to health, stress. Thus, when performing an upward jump, the maximum stress of forces that determines the highest jump height will be optimal. At the same time, in marathon running, long-distance skiing, and other exercises that require athletes to have great endurance, you can sometimes see participants at the finish of the distance fall to the ground from fatigue, and in some cases, the finish ends in a fainting state. It is obvious that in these cases, motor actions are performed with the utmost effort, in which the athlete's health can be significantly damaged. In such cases, the optimal end of the exercise will be the stress of strength, which will show a high result, but the state of health will not be harmed, that is, in these cases, the optimal stress should be lower than the maximum possible.

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

- the first group includes motor actions that can be performed repeatedly in the training process with the maximum (or near the maximum) stress, especially in competition conditions, when the sports result 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 limit, using the motor capabilities of athletes, since the maximum stress of forces damages their health;

- the third group includes sports exercises that are performed with the 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 the first group of movements. Repeated execution of motor actions in training and especially in competition with near-limit the use of motor abilities of athletes are usually valid in sports where the result is achieved by the tension forces in excess of their threshold value (threshold voltage of forces there is a tension force, whereby it becomes possible to perform exercises). So, when training the barbell press from the chest, the athlete can repeatedly try to perform this movement. With an insufficient level of development of physical qualities, it does not work for him until, through prolonged training, he will not be able to reach such a threshold level of strength training that will give him the opportunity to perform the exercise being trained.

Usually such performance of movements even at 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, this strain can lead to injury. Therefore, such training should be carried out with careful medical supervision. At the same time, it is necessary to increase the level of physical fitness of athletes, allowing them to repeatedly perform exercises with near-limit use of motor potential.

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

In connection with the above, we can conclude 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 cause harm to health and is habitual for athletes with a sufficient level of development of physical qualities and the corresponding difficulty of the studied movements.

To answer this question, it is necessary to study near-limit indicators for the main elements of wrestling in the conditions of competitive activity. It is in the conditions of major international

competitions that an athlete shows his maximum (near-limit) physical capabilities, motivated by material, social, and other incentives.

Ongoing research at major competitions (world Championships, European Championships, Russian Championships, 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 selecting and calculating the leading elements of motor activity was taken into account their informativeness, reliability and reproducibility in the conditions of training activities.

Our years of research have allowed to identify and justify the methods of statistical analysis the importance of the six elements of competitive activity: protection - NZ; efficiency of equipment - AT; GPA - SB; interval of attack - IA, a variety of technology - RT and integral level of preparedness - T.

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

1.The successful attack interval (IUA) is the average time between the estimated moves. The attack interval (IA) is the average time between the estimated moves and attempts.

2.Average score (SAT) - the ratio of points won to all techniques performed or the number of fights performed.

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 amount of won and lost TD.

5.Preferential performance (PR) - the ratio of the won techniques in the stand to the sum of all the won techniques (performance in the stand and in the stalls).

6.Variety of equipment (RT) - the number of TD from different classification groups.

Determining competitive characteristics in the course of a fight is very difficult - with a rapid alternation of attacking and defensive techniques in the fight, it is impossible to register all attacking and defensive techniques, the time between performing successive attacking techniques, etc.Therefore, in practice, video recording 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 criteria for their mathematical calculations are mainly elements of tactical and technical skill. All this once again emphasizes the importance of this aspect of skill in the integral display of the specific activity of the wrestler in this type of martial arts. In addition, many years of research and extensive statistical data on the analysis of major competitions have allowed us to formulate and present the following initial positions of the elements of the athlete's motor activity for subsequent training programming:

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

Reserve capabilities of a single combatant are determined by comparing their "absolute circumference" (100% index) at a given time with the elements of a competitive match of a particular single combatant. As a result, it was revealed that in the largest international competitions, wrestlers not only in one or two elements of a competitive match approach the "absolute circle". For example, a fighter of the tempo type of fighting does not reach the "absolute circumference", that is, his reserve capabilities in terms of, for example, the reliability of protection are 9-22%. 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 movement of the athlete to the "circle", i.e. it is possible to actually predict the growth of skill and development of physical qualities. In addition, it allows you to get urgent information about the effectiveness of new sets of exercises introduced into the training program, focused on a specific element of his skill, and evaluate the effectiveness of the exercises. And, finally, to prevent breakdowns, overtraining in those elements of competitive activity in which the athlete came to the "circle".

The second position - the use of six coefficients in the analysis of competitive activity allows you to solve several important problems in the development of wrestling in the world. In particular, to identify the types of wrestlers who demonstrate spectacular wrestling, to evaluate the maximum and permissible indicators of skill of athletes based on these coefficients, to evaluate the selection system, the direction 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 single combatant. An athlete who has reached the "roundabout" in the main element of a competitive match, taking into account individual characteristics, finds additional reserves for further skill growth in other elements of a competitive match.

The fourth position-modeling of competitive activity of the athlete in the conditions of training with the help of special stands. This stage of research is necessary in order to convert relative (percentage)

indicators of competitive activity into temporary, 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 the laboratory.

The fifth position - systematic control by means of pedagogical and instrumental methods of research and system of training facilities of growth of technical skill of the wrestler (from the beginner to the Olympic Champion.), as an implementing factor, which is in conjunction with all elements of the three-level training management system, will allow you to accurately and gradually lead the athlete to the highest sports results.

The results of the research made a significant contribution to the theory of training Greco-Roman style wrestlers, showing that the use of a coherent, theoretically sound and proven system for managing the training process on the basis of optimizing 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 competitors.

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