



## Means and Methods of Development of Physical Qualities of Judo Wrestlers

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**Abstract:** The article considers the means and methods of developing the physical qualities of judo wrestlers. The means of sports training is what helps to increase the level of technical, tactical, physical and psychological fitness. In wrestling at the present time, one of the most important factors that determine the achievement of high results is, along with tactical and technical skills (the dominant factor in martial arts), a high level of development of physical qualities, mainly speed-strength and endurance.

**Keywords:** means, method, development of physical qualities of judo wrestlers, sport, and training.

### Introduction.

To date, the problem of choosing adequate means for improving the physical qualities characteristic of wrestlers' sports activities remains relevant. This influence has an objective basis, since the change in quality is the greater, the higher the compliance of the specifics of the exercise with the objectively existing structural and physiological features of the developed quality.

### Material and methods.

For the development of power and speed-strength qualities, the most effective modes are those that bring the level of muscle functioning closer to the limit for this quality:

- a) for maximum force, maximum stress;
- b) for the speed force, the maximum speed at the optimal resistance value (50-75% of the maximum);
- c) For the speed of unburdened movement, the maximum speed of movement at a small (10-20% of the maximum) load.

As for training methods, they consider the most effective to be complex, involving a mixed mode: alternating powerful stresses with extremely fast movements with light weights (10-20% of the maximum).

The emphasis in such training should be directed to the power of the developmental exercise. It can be assumed that the first load with a large weight (or maximum, in the case of using isometric exercises) due to powerful afferentation increases the excitability of the motor centers and thereby provides a more powerful effector impulsation during the second (specific) work and, therefore, its more pronounced training effect.

Since in sports wrestling skill is determined not only (and not so much) by the level of actual power or speed-strength qualities, but in many respects by the ability to correctly use various additional forces (one's own and the opponent's) during the fight, the main means of improving the wrestler's ability to use power rationally can serve as contractions. Allocate contractions with different settings:



- a) fight against a physically strong but less experienced opponent;
- b) fights of a "game" nature;
- c) setting for conducting throws with a fall;
- d) setting to use the efforts of the enemy;
- e) setting for the execution of techniques in the direction of movement of the enemy;
- f) setting to maintain balance in various positions;
- g) Setting to hold static positions in the fight.

As noted earlier, it is very difficult to select training aids that are adequate in terms of all functional parameters to the mode of operation of the body in a competitive exercise. Therefore, the complex method allows to some extent to solve this problem. When choosing the means of developing speed-strength qualities, it is necessary to take into account their training effect for athletes of different qualifications and different manners of conducting a competitive duel. But perhaps the most important for the effectiveness of special physical training is its content and such organization in time, which is able to provide significant and long-term adaptive reactions that are adequate to the requirements of competitive activity.

Competitive activity in judo proceeds with a variable intensity of neuromuscular tension with discrete extreme loads. This places high demands on the motor-coordination abilities of judo wrestlers, on the ability to quickly and accurately assess the spatio-temporal conditions of activity, on the ability to switch from one action to another, etc. Particularly high are the requirements for the implementation of speed capabilities and specific endurance - speed, power, speed-strength. Competitions require athletes to demonstrate a high level of physical performance.

Thus, judo is characterized by a high intensity of technical and tactical actions that require the maximum muscular effort from the athlete and the ability to demonstrate them in a rapidly changing environment. Periods of high activity with pauses of relative rest are about 30 s, the maximum heart rate is 180-230 beats / min, the total oxygen debt is from 5.0 to 7.9 liters. This type of activity requires the mobilization of the body's functional capabilities and places high demands on the athlete's performance.

In judo, the effectiveness of performing technical actions depends not only on the level of endurance development as a performance of the respiratory and cardiovascular system (CVS), but also on the development of speed-strength qualities.

So, in judo, the value of the pulse is influenced by the features of a combination of diverse complex alternating actions of an athlete: the struggle for a grip, preparatory actions for a hold, successful and unsuccessful attempts to hold a hold, resistance to actions and overcoming the resistance of an opponent, etc. The analysis shows that further scientific research in developing the problem of special performance in wrestling should first of all concern a clear quantitative expression of the main factors that determine the level of endurance and the development of speed-strength qualities. At the same time, attention should be paid to those components of special endurance, which, although noted by specialists, are not the subject of special comprehensive studies. First of all, this is the level of mobility and lability of the main functional systems, the efficiency of work and the ability to effectively recover, the development of the functions of external respiration and the improvement of the processes of diffusion and blood perfusion.

Special endurance develops when performing training tasks: aerobic, mixed aerobic-anaerobic, anaerobic glycolytic and anaerobic alactic orientation. Aerobic focus.



Means - specially constructed training bouts, a series of mannequin throws; exercise intensity at the level of 70-80% of the maximum possible; its criterion can be the heart rate, which should be at the level of 170-180 beats / min; exercise duration - 1.5 minutes; in the last repetitions, some wrestlers, especially heavy weight categories, may experience a decrease in the intensity of the exercise. This is acceptable if the heart rate is in a given mode, but if it decreases, then work should be stopped. It is not recommended to allow an increase in the pulse regime due to additional volitional efforts above 180 beats / min; the number of repetitions is 8-9.

The criterion for the adequacy of the number of repetitions can be pulse duty, which after completing the task should not exceed 400-450 beats; if it is higher, then this indicates a change in the direction of the training task from aerobic to mixed or even anaerobic glycolytic.

For wrestlers of heavy weight categories, it is advisable to conduct two series of exercises: in the first 6-7 repetitions, in the second 4-6. Rest intervals are determined by the dynamics of heart rate: by the beginning of the next repetition, the pulse should be at the level of 130-140 beats / min.

As a rule, the rest time is about 1.5 minutes. When planning a training task in two sets of exercises, the rest time between them should provide a sufficiently complete recovery. The nature of the rest: it is advisable to fill the rest intervals with low-intensity work; breathing exercises can also be recommended. The most effective improvement of the aerobic component of special endurance is carried out during rest after repetitions of dummy throws or segments of a training bout. Mixed aerobic-anaerobic orientation.

The variability of such training tasks is quite significant and depends on the ratio of aerobic and anaerobic energy supply mechanisms; so, when throwing a stuffed animal with a deflection at a rate of 10 throws per minute, the ratio of work performed due to aerobic and anaerobic energy sources is approximately equal. As a means of preparation, training bouts with somewhat longer (up to 4-4.5 minutes) periods of struggle are usually used. The following indicators can serve as criteria for a mixed mode of operation: heart rate - from 150 beats / min to maximum, lactic acid content in the blood - from 40 to 120 mg%, pH 7.2-7.3, oxygen consumption - from 2 l / min to max. Anaerobic glycolytic orientation. Training bouts built in a special way or a series of dummy throws can be used as training aids; the intensity of the exercise is close to the maximum. From repetition to repetition, the pace of throws or wrestling decreases due to the onset of fatigue, but this intensity will be near the limit in relation to the current state of the wrestler; the duration of the exercise is about 2 minutes; the number of repetitions is 3 in one series, it is advisable to carry out two series; if wrestlers of heavy weight categories cannot withstand the given intensity for 2 minutes, then the time of the exercise should be reduced (a signal may be a noticeable decrease in the pace of the fight or dummy throws), but in this case it is necessary to conduct the third series. It is recommended in the last repetitions of the series to use short-term difficulty in breathing or even holding it.

It is not advisable to carry out the fourth repetition in the series, since by this moment the capacity of glycolysis will be largely exhausted, therefore the intensity of work will inevitably decrease, respiratory processes will become more active and the anaerobic glycolytic orientation of the training task will change to aerobic.

Rest intervals: after the first repetition - 2 minutes, after the second - 1 minute. It is recommended to maintain such "hard" rest intervals for wrestlers of all weight categories. As for the rest time between series, it is not the same for representatives of light, medium and heavy weight categories, and the criterion for sufficiency is the elimination of a significant part of the resulting oxygen debt; It is advisable to fill the rest intervals between repetitions with calm walking.



When performing training tasks of anaerobic glycolytic orientation, shifts occur in the body of wrestlers, characterized by the following indicators: the heart rate is maximum, oxygen consumption is close to the limit, the content of lactic acid in the blood is up to 150 mg% and above, blood pH is below 7.2; the values of pulse and oxygen debt are close to the limit: for lightweights, respectively, 2500-3000 beats. and 8-10 l; for middleweights - 3000-3500 beats. and 10-12 l; for heavyweights - 3500-4000 beats. and 10-12 liters.

Anaerobic alactate orientation. The means may be a series of throws of the stuffed animal; exercise intensity - maximum; exercise duration - up to 15 s; the number of repetitions is 5-6 in a series, the number of series is not more than three, since after the fourth series the size of the resulting pulse and oxygen debt sharply increases, which indicates that glycolysis has entered the energy supply of the exercise, i.e. the anaerobic alactic orientation of the training task changes to anaerobic glycolytic; rest time between repetitions - about 2 minutes (for the heaviest wrestlers it can be somewhat longer), by the end of his pulse should be at the level of 150-160 beats / min; rest time between series - from 6 to 10 minutes, depending on weight categories.

The nature of the rest between repetitions is active, calm walking is advisable. The systematic use of means and methods of selective influence on individual components of wrestlers' special endurance over a sufficiently long period gives a tangible effect. The level of development of wrestlers' special endurance is limited to the greatest extent by the anaerobic capabilities of athletes.

Aerobic work should create a basis for the special performance of judoists, prepare the biological basis for a safe high-intensity anaerobic performance of the body. In particular, aerobic work leads to: - a decrease in membrane and intracapillary resistance to diffusion and an increase in the average alveolar-capillary gradient. This is achieved by increasing the number of functioning alveoli and blood capillaries.

By increasing the volume of blood in the pulmonary capillaries, the content of hemoglobin in the blood increases and its oxygen-binding properties change, which leads to an acceleration of capillary blood flow. These adaptive mechanisms increase the rate of oxygen diffusion compared to the resting level by 15-20 times; - regulation of complex complexes of nervous and humoral mechanisms of respiration and the oxygen transport system; - changes in red blood parameters, which is characterized by an increase in the number of red blood cells, an increase in hemoglobin and hematocrit; - improving the supply of the heart muscle with energy, which has a number of specific features. The energy needed to perform mechanical work, the heart receives mainly due to the aerobic process of nutrient breakdown - oxidative phosphorylation.

This is the fundamental difference between the energy supply of the myocardium and the energy supply of skeletal muscles, which, under intense short-term loads, can cover their energy needs through anaerobic processes, thus forming an oxygen debt. Even at rest, the heart muscle consumes a large amount of oxygen (8-10 ml / 100 g / min); - increase in the number of mitochondria in cells and their energy potential.

### **Conclusion.**

The respiratory chain is the main energy conversion system in mitochondria. Enzyme complexes are sequentially oxidized and reduced in it, as a result of which energy is released. Due to this energy, ATP is formed from adenosine diphosphate (ADP) and inorganic phosphate in the three main links of the respiratory chain, i.e. oxidative phosphorylation occurs. Listing only the main advantages of the primary development of the body's aerobic capabilities allows us to put forward a hypothesis about the need to develop a biological model of the sports performance of judo wrestlers



based on the development of the diffuse and perfusion capacity of the oxygen transport system of athletes.

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