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The effectiveness of monitoring the special endurance of athletes

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Abstract
Aim: It consists in developing a test for a special endurance monitor, having studied the training composition and characteristics of martial artists.

Methods: In the article, we used the following techniques, based on differences in the dynamics of motor activity (DMA), we divided athletes into 3 groups:

"flat", characterized by relative uniformity of motor activity in the process of wrestlers' competition;
"double peak", characterized by a twofold increase in motor activity at competitions more than once in each period;
"triple peak", which describes a three-fold increase in motor activity during competition with one increase in the first period and two increases in the second.
Results: The study of the dynamics of the I-v motor activity of a wrestler (DMA) based on the results of 10 registered competitions showed that in the first periods this wrestler was much more active at 40-60 seconds of the bout and at 60-80 seconds. In these 2 short, 20-second intervals, 20 technical movements were recorded for this wrestler, which is 40% of the total number of technical movements performed by the same athlete at the first stages of the fight (this result corresponds to operation № 1). In the second periods, wrestler I-v was more active in 220-240 s and 240-260 s (29% increase in motor activity), 320-340 s and 340-360 s (31% increase in motor activity). This combination of the sequence of movements of the wrestler I-v corresponds to operation 4 for the second periods. The combination of modes 1-4 corresponds to the algorithm according to the "triple peak" type of a given sequence of actions.
Conclusion: The use of a specially developed test during training allows you to improve the control of the athlete's physical condition. The comparison of individual indicators in the text describing special physical training with model descriptions allows an athlete to effectively structure training processes based on the level of special physical training (SPT) and sports category.

Keywords: initial training, athlete flexibility, endurance, monitoring, qualified athletes.

Introduction

In the sports literature of recent years, it has been repeatedly emphasized that sports training should be considered as a process of managing the physical condition of an athlete. At the same time, the management process can be provided only if there is an indissoluble connection between the managing object (coach, methodologist) and the managed object (athlete). The organization of monitoring, which involves the widespread use of tests in sports and pedagogical practice, is just an analogue of repeated communication. Currently, tests are widely popular in various sports and are used for quick, current and step-by-step control.

Experts in the field of martial arts pay great attention to the assessment of various aspects of athletes' physical fitness, primarily special physical training (SPT) and endurance, bearing in mind their physical capabilities, which provide athletes with motor activity at a particular job.

Many years of research by specialists were aimed at developing specific tests that could reflect the key elements of competitive activity. At the same time, it is generally recognized that the level of SPT can be assessed only with the help of special tests modeling the main parameters of competitive activity, and the inadequacy of non-specific tests for solving these problems. To assess the SPT of wrestlers, a variety of pedagogical and biomedical tests are used, including a study of the dynamics of the reaction of various body systems to a given load, throwing a training dummy or a partner with an assessment of the main throws in quantity and quality. Over the years, a number of authors have proposed tests to assess SPT in various types of wrestling, as well as formulas for calculating the results of the tests (A.A. Novikov, 2012, G.S.Tomanyan 2000, F.A. Kerimov 2018, 2020 and others).

However, despite the fact that there are currently a large number of tests to assess SPT and endurance, this problem has not been solved. Many scientists and teachers have repeatedly stressed the existence of significant differences in the characteristics of competitive competitions held by athletes, and also touched upon the need to take these differences into account and apply them in educational and training processes. However, although it is well

known that the closer the tests are to the specific characteristics and conditions of wrestlers, the higher their informativeness, however, not all existing tests are able to take into account the individual motor characteristics of athletes. According to some authors who suggested that their tests should be used in practice, in general, their tests correspond to the characteristics of the movement of athletes, but are not supported by sufficient evidence. This means that such a state of applied tests is not typical for every athlete and does not give a clear idea of his physical fitness.

Methods

Since the dynamics of motor activity the number of technical movements during the competition) is the most important stage of the competitive activity of wrestlers, we studied it using mathematical methods.

Results and discussion

This means that the motor activity of some athletes in competitive competitions is characterized by pronounced unevenness in the course of the fight, that is, when compared with others, there is a significant difference in the number of technical movements performed by them during a certain time interval of the competition. The motor activity of other athletes during the competition can be characterized as relatively homogeneous. Some of the wrestlers occupy an intermediate position. The DMA for each wrestler is a rhythmic description that varies within certain limits from competition to competition (depending on the difference in the training of the partner and the current state of the athlete), but always retains its structure. With the exception of fights, which the wrestler loses, because in such a situation, the usual type of DMA is disrupted by the opponent's strong movements.

To determine whether a wrestler belongs to one of the three groups, it is necessary to have information about 10 competitions held by this athlete, which ended with his victory and lasted at least 6 minutes (an early completed competition has some interesting information). To record the activities of the competition, it is necessary to use a special protocol.

After collecting information about 10 participants of the competition of the studied wrestler, all technical actions performed by them are concentrated in a 20-second interval, that is, according to the results of 10 competitions, all technical actions performed by the athlete in the first 20 seconds and so on.

After calculating the technical actions, it is necessary to use an algorithm for determining the type of mode of action of a wrestler's competitive activity. Let's consider the motor activity of one of the wrestlers.

It is necessary to determine the type of movement mode of the wrestler we are interested in and use one of the three tests listed below to assess his special physical training.

1st test. For “Double peak” wrestlers. A six-minute test was conducted intermittently for two 3 minutes: 10 throws in the first 60 seconds, then a spurt - 6 throws, 3 throws in 18 seconds, a spurt - 6 throws and 12 throws in 6 seconds at the pace of 1 throw. After a minute break, 15 throws were made in 90 seconds, a spurt - 6 throws, 3 throws in 18 seconds, a spurt - 6 throws and 7 throws at the pace of 1 throw in 6 seconds.

2-test. For “Triple peak” wrestlers. A six-minute test in 2 three-minute cycles with a 1-minute break: 10 throws in 60 seconds in the first 3-minute period, then a spurt of 9 throws, 10 throws in 60 seconds and a spurt of 9 throws.

3-test. For “Flat” wrestlers. A six-minute test on two 3-minute breaks with a 1-minute break: 8 throws in the first 45 seconds, then a spurt - 6 throws, as for the first time, in the next 2 and 3 minutes. The sequence of shots after a one-minute break is performed similarly to the first 3-minute series.

In these tests, the throw in the spurs is performed with stretching, while the spurts - "breaks" between turns - allow you to avoid monotony of execution.

The weight of the dummy should be 35-40 percent of the weight of the wrestler. The timing of the performance of the spurts is fixed as follows. Simultaneously with turning on the stopwatch at the command "Attention spurt", the wrestler begins to perform throws at maximum speed from a standing position. The stopwatch that records the time of the spurt

stops by the time when dummy touchs the carpet at the last throw of the spurt. The correlation coefficient (test reliability criterion) of the results of two series of tests performed by athletes is 0.9, which indicates the reliability of the tests used. The informativeness of the developed tests is statistically significant compared to those currently used ($P < 0.05$).

The tests included normative scores from 6 to 1 points, set by athletes of different qualifications (three separate groups) depending on the time of the spurts (total time of the spurt). The best result in terms of the execution time of the spurts is 6 points, the lowest result is 1 point. For example, if a first-class wrestler A-in, belonging to the "Flat" group by type of motor activity in competitions, performed spurts in 113 seconds in a special test, this means that he is rated at 4 points.

Based on the sum of the points scored on the spurt test and the arithmetic mean (score), this is a certain number of conventional units (CU) that characterize the specific physical fitness of the athlete (see table 3). The pedagogical assessment for the completed throw was presented in table 2, determined in accordance with the scale proposed by A.M. Dyakin and Sh.T. Nevretdinov (1980). For example, wrestling master V-in took 52 seconds to perform 4 spurts in a double peak test, which is rated at 6 points according to table 1.

In this test, the average pedagogical score given to him for throwing a spurt is 4.6. It follows from this that according to the form of evaluation proposed by us, wrestler V-in was rated at 24 CU - the maximum number of conventional units that can be obtained for performing specific tests. Table 4, based on the test results, shows their special level of physical training from the number of conditional units collected by the wrestlers.

Figure 1 shows 6 SPT and endurance levels of wrestlers, each of which corresponds to certain abilities of wrestlers. The highest - the first level of training (24-22 CU) shows that the athlete belongs to an excellent level of SPT and has a high chance of winning prizes at competitions.

The second level of training (21-19 CU) shows that the athlete is sufficiently prepared for the competition. The third and fourth levels

Table 1. Algorithm for determining the type of mode of action of wrestlers of competitive activity *(Based on the results of 10 competitions won within 6 minutes)*

№	Study of the dynamics of motor activity of wrestlers	Type of movement mode		
		Double peak	Triple peak	Flat
	For the first periods Determination of the largest number of technical movements in the first two 20-second intervals, close to each other in the first periods	-	1-4	1-6
1	Peak of motor activity equal to or greater than 33%	1-3	1-5	2-5
2	Motor activity increases by no more than 32%	-	2-4	2-6
	For the second periods Determination of the closest to each other by the largest number of technical movements in two 20-second intervals	-	-	-
3	Peak of motor activity equal to or exceeding 36% (in the second periods, it is these wrestlers who have less than 29% of other increases in motor activity)			
4	Increases by two in motor activity that have reached 29% or more			
5	A one-time increase in motor activity by no more than 28%, but by more than 35%			
6	There is no increase in motor activity, which reaches 29%			

Table 2. The number of points awarded to athletes of different categories and groups of movements for the time (in seconds) of performing spurts in special tests.

Points	Special test					
	Double peak		Triple peak		Flat	
	1st category and CMS	*MS and MSIC*	*1st category and CMS*	*MS and MSIC*	*1st category and CMS*	*MS and MSIC*
6	No more than 64	No more than 52	No more than 81	No more than 67	No more than 104	No more than 85
5	65-69	53-57	85-91	68-74	105-111	88-94
4	70-75	58-62	92-97	75-81	112-118	95-102
3	77-82	63-67	98-103	82-87	119-126	103-110
2	82-87	68-73	104-109	88-94	127-134	111-118
1	88-93	74-79	110-116	95-101	135-142	119-126

(18-15 CU and 14-11 CU, respectively) can be described as satisfactory, while the fifth - 10-7 CU - was considered insufficient for successful participation in the competition. The sixth level of fitness (6-14 CU) indicates very low functional capabilities of the athlete. The last two levels of training can be described as unsatisfactory.

Thus, wrestlers take into account their individual motor characteristics when conducting test competitions designed to evaluate SPT.

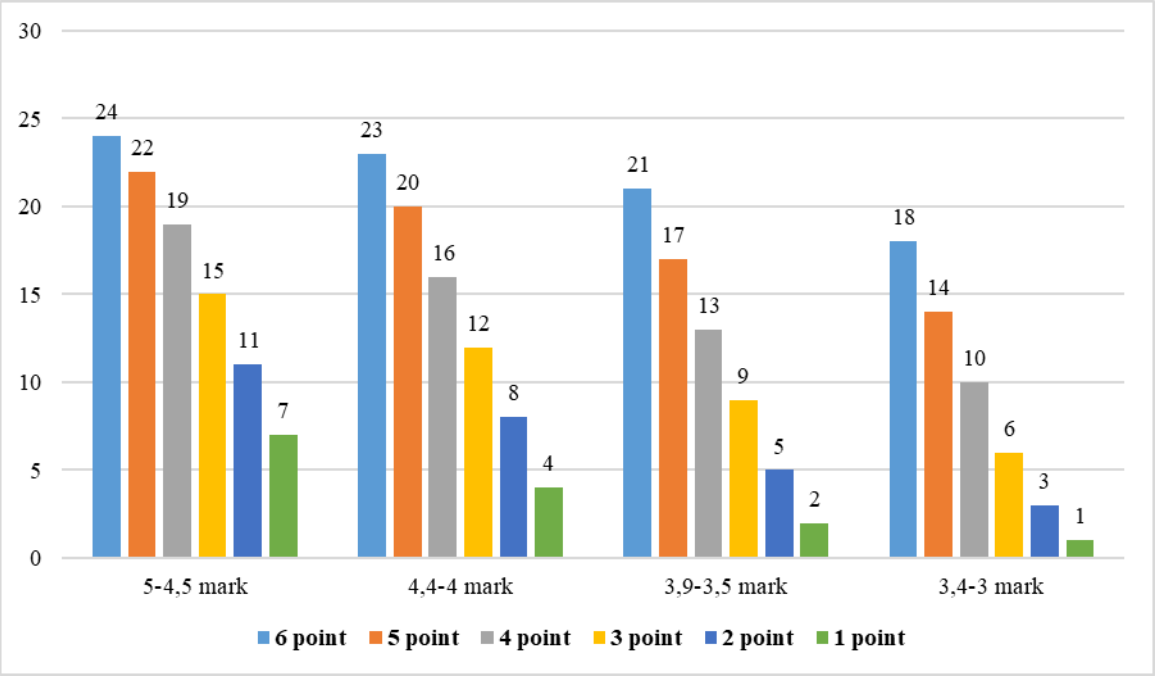


Figure 1. The sum of the conditional units issued to wrestlers according to the average pedagogical estimates during the performance of tests in tests and for the throw.

Conclusion

The monitoring system provides normative indicators (models) to assess the athlete's readiness for the tests. The following information is the regulatory framework for the implementation of step-by-step control. Comparing the individual performance of each athlete with the specified model indicators allows us to accurately assess the preparedness of wrestlers, their ability to achieve high sports results. A distinctive feature of our unique approach to the evaluation of tests performed by athletes is that the evaluation of tests was carried out taking into account the duration of throws and the quality of their performance.

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