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# The Physiological Intensity of Physical Activity, Taking into Account the Individual Profile and Model Characteristics of Physical Fitness in Belt Wrestling Classes

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**ABSTRACT**

The article provides information on the practical use of calculating the physiological intensity of physical activity, taking into account the individual profile and model characteristics of physical fitness of belt wrestlers. The use of model characteristics of highly qualified belt wrestlers can be considered as a reference indicator for planning levels of physiological intensity of physical activity. The difference in the indicators of the individual profile of physical fitness of wrestlers from their model values makes it possible to identify and correct the disadvantages of choosing training equipment, to change the ratio of volume and physiological intensity of physical activity. This situation is due to the fact that when selecting funds, it is necessary to build complex training sessions with the solution of several tasks and at the same time take into account the strengths and weaknesses of athletes' physical fitness.

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## Introduction

The use of model characteristics of physical fitness, which form the basis for comprehensive monitoring and evaluation of athletic training, can become a reliable subsystem of long-term sports training of belt wrestlers. The need to use model characteristics of physical fitness is considered in the works of many specialists in traditional and national sports [1-7]. It is known that the model characteristics of training help specialists and athletes themselves to select and correct training effects and increase the level of training effectiveness. It makes it easier for trainers to manage the educational and training process, allow them to control the level of physiological intensity of physical exertion, adjust the reserve capabilities of the body's functional systems and balance them with training loads. The creation of model characteristics of belt wrestlers is carried out in stages, by creating a method of systematization and assessment of the functional state of the body for timely correction of physical activity, engaged in physical culture and sports, and a computer-implemented system for its implementation [8,9]. The essence of this method is to accumulate data to obtain a model profile of highly qualified belt wrestlers, taking into account their weight categories. This approach makes it possible to speed up the process of sports training and motivate the athlete himself to achieve a model level of physical fitness, as well as a functional and psycho-emotional state. In our example, the model characteristics of a single level of fitness of highly qualified wrestlers act as a reference indicator for achieving [8,9]. At the same time, it is possible to create stage-by-stage and perspective models of wrestlers' fitness. When comparing them, it is possible to identify and correct the disadvantages of choosing training tools, to change the ratio of volume and physiological intensity of physical activity.

The purpose of this study is to determine the possibilities of practically using the physiological intensity of physical activity, taking into account the individual profile and model characteristics of physical fitness of belt wrestlers.

## Research Methods

The following research methods were used in this work: medical history, anthropometry, psychometry, control tests, design and modeling of physical fitness profiles of belt wrestlers. Control and pedagogical tests with the participation of highly qualified wrestlers of 1-3 courses of study engaged in belt wrestling were conducted after the end of the sports season. A total of 32 indicators of physical fitness were measured in young men aged 17-22.

The results were processed mathematically, and they formed the basis for creating model characteristics of the physical fitness of highly qualified belt wrestlers on the sigma scale. All research is conducted within the framework of writing a thesis.

**Results and Discussion**

The results of the study. The study of the physical development and physical fitness of belt wrestlers has shown that with the growth of athletic qualifications among wrestlers, the greatest positive changes were found in the indicators of proper strength abilities and special endurance, and the least in the manifestation of speed abilities and special speed endurance. At the same time, the dependence of physical qualities on weight categories was noted.

The experiment was conducted from September to December 2023 in sports schools of the Republic of Tatarstan and Udmurtia. The analysis of the results characterizing high-speed (60 m running), high-speed strength (long jump from a standing position), actual strength (pull-up on a high crossbar, flexion and extension of arms from a prone position), flexibility (standing tilt), endurance (3000 m running) of belt wrestlers is carried out. Individual physical fitness profiles were identified for each wrestler in September 2023. Next, the individual profile of the wrestlers was compared with the model characteristics of highly qualified belt wrestlers, which made it possible to assess their level of physical fitness. Strong and weak indicators on control tests were noted, which formed the basis for the development of a pedagogical recommendation on the preparation of a training program for a six-month pedagogical experiment. At the same time, the total volume and intensity of physical activity and the structure of the training process for both research groups were the same, but the correction of physiological intensity by levels was carried out in the wrestlers of the experimental group, taking into account the manifestation of weaknesses in fitness.

The intensity of physical activity was determined by heart rate and taking into account the maximum oxygen consumption. The method of calculating the intensity levels of physical activity is simple and convenient. We used five levels of physiological intensity of physical activity.

The first level is characterized by physical activity of 60-70% of the maximum heart rate and 55-65% of the maximum BMD. At the same time, physical training had an aerobic (moderate and moderate intensity) focus on developing endurance and strength capabilities of belt wrestlers.

The second level of physiological intensity of physical activity is characterized by an indicator of 71-75% of the maximum heart rate, and can be realized by both distance, strength and speed (interval) training.

The third level of physiological intensity of physical activity is characterized by the implementation of distance and strength training equipment at 76-80% of the maximum heart rate. In this case, adaptive changes occur in the body, aimed at the development of aerobic energy supply mechanisms and the development of oxidative mitochondria in skeletal muscles. We note that this level is rarely realized and there is always a transition from the second level to the third level of intensity. But it all depends on the anaerobic threshold of the wrestlers. If the anaerobic threshold of the wrestlers is low, then it is necessary to perform interval and tempo training with a competitive element in order to obtain a training effect. To obtain an anaerobic threshold with a high heart rate, it is necessary to monitor the manifestations of the training effect of the program.

The fourth level of intensity is realized in the process of performing interval training with a competitive effect. For evaluation, it is important to take into account the heart rate, the pace of exercise and the perception of physical activity.

The fifth level of physiological intensity of the load is realized before the competition to stimulate the anaerobic capabilities of the wrestlers' body. At the same time, control fights are actively used, with complications due to the use of fights with several partners in a row. Duels are necessary to increase the efficiency of anaerobic energy supply of muscular activity, which increases the ability to make effective throws performed at high speed. It is important to note that heart rate indicators are a condition for determining the level of intensity of training and competitive means. A smartwatch or wireless heart rate monitors were used to measure heart rate, which optimize monitoring. We determined the heart rate using the Karvonen method, which is the most common and is used by many athletes in sports [10]. It is important to find your maximum heart rate and measure your heart rate at rest. The maximum heart rate is determined by subtracting the age of the athlete from 220. The reserve heart rate is determined by subtracting the resting heart rate from the maximum heart rate. The formula for calculating intensity levels allows you to determine the lower and upper limits of heart rate for a given intensity level. For example, for the first level, the lower limit of the heart rate will be calculated by multiplying the reserve heart rate by 0.60 and summing the resting heart rate.

Thus, the use of calculating intensity levels using the Karvonen method facilitates the control of training effects and the management of wrestlers' athletic training. For wrestlers, it is possible to calculate in advance the zones of the training heart rate using the Karvonen method for various resting heart rate indicators, which facilitates the process of monitoring the implementation of training and competitive loads.

Another way to identify the maximum heart rate of wrestlers is to conduct a cycling ergometric test with a stepwise increasing load to determine the potential of the heart.

It was also important to monitor the individual profile of the experimental group's wrestlers after each mesocycle (1 month) of training. The wrestlers showed physical qualities that gave a high growth rate, such as speed (7.8%), strength (4.5%) and special endurance (3.9%). Consequently, the selective implementation of training tools in a comprehensive manner, taking into account the strengths and weaknesses of each wrestler's physical qualities, makes it possible to significantly improve the lagging physical qualities (from 2.35 to 6.7%). It is necessary to predict the level of indicators of physical fitness of wrestlers in order to achieve the highest result in the manifestation of physical abilities. For example, the 100 m run characterizes the speed qualities of wrestlers and varies from 13.45 to 12.27 seconds for qualified wrestlers over a four-year cycle. Comparing the individual profile with the model indicators in the 100 m run helps to more purposefully build an educational and training process aimed at developing speed qualities. And so, it is possible to compare all indicators of control test exercises and types of sports training, which facilitates the choice of means and the focus of training effects. To characterize the speed qualities of wrestlers, you can also use running for 30 and 60 m on the move, single movement

time, reactions to a moving object, and much more.

The "long jump from a standing position" test was used to characterize the speed and strength qualities of the wrestlers. A comparison of the individual profile of wrestlers in terms of speed and strength indicators with model characteristics showed that their range is narrowing from year to year. Therefore, it is necessary to increase the use of means in training sessions aimed at developing speed and strength abilities. Analyzing the model characteristics taking into account the weight categories of wrestlers, it can be noted that speed and strength qualities have a high growth rate in the light and medium weight categories (up to 14%).

The endurance of the wrestlers was assessed by running for 1000 and 2000 m, which makes it easier. Year after year, the range of endurance in test exercises was expanded from 7.50 minutes to 7.10 minutes, taking into account the qualifications and weight categories of belt wrestlers. The importance of endurance quality is determined by the need to expand the mechanism of energy supply for muscular activity.

Strength indicators were assessed using test exercises: lifting the torso in 1 minute, pulling up on a high crossbar, throwing a stuffed ball from behind the head (3 kg).

The experiment showed that taking into account the difference between the individual AF profile and the model indicators, as a result of calculating and determining the physiological intensity of the realized load, the effectiveness of competitive activity is observed (1st place - 4.2%; 2nd place - 3.5%, 3rd place - 12%).

**Conclusions**

Based on the comparison of the individual profile of physical fitness of wrestlers with the model characteristics of physical fitness, the correction of training equipment was carried out and the level of physiological intensity of physical activity was determined. Recommendations were drawn up for each fighter of the experimental group, which reflected the advantages and disadvantages of physical fitness. The condition for eliminating the weaknesses of the wrestlers' physical fitness was the comparison of indicators in test exercises and their growth rates. In the process of selective exposure, special attention was paid to those qualities that had a high level of growth during the experiment. The need to use training tools to develop physical qualities at a rapid pace, as well as those lagging behind in development, was noted. This situation is due to the fact that when selecting funds, it is necessary to build training sessions of an integrated orientation with the solution of several tasks. For example, in one lesson, the task of developing endurance of 30%, speed work of 30% and strength training of 40% is solved. Another option is 40% technical training, 10% speed training and 50% tactical training. The options for combining physical exercises of various orientations depend on the stage and period of training of wrestlers. Parallel or sequential development of physical qualities of wrestlers comprehensively in one lesson can become the basis for improving the effectiveness of physical training.

Thus, the physical training of belt wrestlers should be considered through the prism of improving physical performance, functional and psychological training.

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