

The Influence of Training Loads on the Functional State of the Cardiorespiratory System in Girls Doing Judo.

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ABSTRACT

In work for an estimation of a functional condition judoists at the age from 19-24 years individual monitoring of indicators of haemodynamics in reply to loadings of various capacity is carried out. It is established, that indicators of haemodynamics at judoists reflect not only level of physical working capacity, but also reflect restoration terms. Individual monitoring of a functional condition of judoists in the course of a training cycle allows to correct in due time training process, and also purposefully to carry out actions for expansion of a range of adaptable possibilities muscul and haemodynamics systems of judoists.

Keywords: judoists, a functional condition, haemodynamics indicators, physical working capacity, level of working, an adaptedness range, individual monitoring.

Introduction

Modern sport with ever-increasing physical activity makes increased demands on the functional state of the body of girls - athletes. Training and competitive loads have reached such values that their impact on the body of athletes engaged in non-traditional sports is on the verge of the maximum possibilities of individual adaptation (L. Shakhlina 1995, Khoshimov et al. 2017., T. Sokha, 2002 Khoshimov et al. 2021., Safarova 2021). Often, coaches do not take into account the biological characteristics of girls, and the commercialization in modern sports does not allow adhering to the classical foundations of the training process, taking into account the clear organization of the transition period. During the training process, coaches do not pay due attention to the principle of individualization, in particular, individual control over the functional state of each athlete to assess the adequacy of the applied loads. So, forcing physical activity can lead to a violation of the protective-adaptive reactions of the body, entailing a violation in the health state of athletes (Vrublevsky E.P. 2003., Graevskaya N.D. 2003., Khoshimov et al. 2018., Martirosov E.G. 2008., Pavlova O. I. 2004., Botova L.N., 2014., Khoshimov et al. 2020.,). The analysis of scientific literature showed that information about the health of athletes, about their functional

capabilities, the specificity of adaptive capabilities to extreme physical and psychoemotional stress, which sports medicine and physiology have, are scarce and insufficient. It is also necessary to know about the peculiarities of the female body, the fitness indicators of girls, depending on the chosen sports specialization. The construction of the training process, taking into account the current functional state of the body of female judokas, is the most expedient in modern women's sports. The assessment of the individual characteristics of the functional state of the female judo body, taking into account the peculiarities of recovery, led to the conduct of this study.

Purpose of the research: to study the effect of training loads on the functional state of the cardiorespiratory system in girls doing judo.

To achieve this goal, the following tasks have been identified:

1. To study the peculiarities of the hemodynamics of female judokas for various training loads.
2. To reveal the individual characteristics of hemodynamics among female judokas, depending on the level of physical performance

Research methods: Highly qualified female judokas who are members of the national teams of the Republic of Uzbekistan, who have repeatedly represented Uzbekistan at international competitions, and also participated in the Asian Games, were examined. All surveyed athletes aged 19-24 have sports qualifications from 1 category to the master of sports of international class, sports experience from 5 to 10 years. Sports exercise has a significant impact, primarily on the cardiorespiratory system, which manifests itself both at the functional and morphological levels. In this regard, we assessed the functional state of athletes on the basis of cardiorespiratory indicators according to such indicators as - heart rate (heart rate) and blood pressure (blood pressure), PD - pulse pressure, IOC - minute blood volume, SD and DD - systolic and diastolic blood pressure, VI (vital index), as well as VC (vital capacity of the lungs), BMD (maximum oxygen consumption). Determination of physical performance was carried out using functional tests PWC-170 and IHST (index of the Harvard step test). The recovery of the female judokas' organism was recorded at 2, 3, 4, 5 minutes after the load.

Results of the research: Individual monitoring of hemodynamics of 19-24 year old female judokas was carried out. In 13 surveyed female judokas, the arithmetic mean values of hemodynamic parameters were calculated. An increase in the minute volume of blood circulation was established after 2 training loads. If at the initial level for all female judokas the IOC (minute blood volume) was $- 5.79 + 0.34$, then after physical exertion at 2 minutes of recovery it was -

7.48 + 0.31 (Table 1). It has been established that among female judokas, the maintenance of the minute volume of blood circulation (MCV) is carried out due to a high heart rate (HR). We have differentiated the relative values of the general physical working capacity of female judokas, depending on the level of sports qualifications. Revealed the relative values of physical performance. The highest physical performance was established for highly qualified athletes. So for Tovashevs (weight 61 kg.), The power of work at 1 and 2 loads was 706.5 kg or 117.07 watts, physical performance was 1121 kg / m / min. Matniyazovs has 923.6 kg / m / min with an IPC of 59.6 ml. and Yuldashevs PWC-170 value is 908.3 kg / m / min. (weight 48 kg). The values of the MIC (relative value) approach and correspond to those characteristic of men and is -63.9 ml. However, athletes with sports qualifications of the II category (Must-oi) had low VO₂ max values - the relative VO₂ max was 52.1 ml / kg / min, and the absolute VO₂ max was 2.8 l / min. The data obtained are also confirmed by the indicators of physical performance according to PWC - 170, which amounted to 792.7 kg / m / min, corresponding to the average level. At the same time, the severity of changes in hemodynamic parameters with a sequential increase in the load in the athletes examined by us indicates a more economical work of the cardiovascular system. The analysis of hemodynamic indices indicates that the majority of female judokas have a good sports form and a high level of fitness, which provides an optimal response to the training load. In this regard, a moderate number of muscle fibers are involved in the work, therefore, the intensity of metabolic processes proceeds moderately, having less effect on the work of the circulatory apparatus. This statement is also confirmed by the recovery indicators for all analyzed hemodynamic indicators.

Table 1. Dynamics of changes in functional indicators among qualified female judokas depending on loads of different power

	Indicators	Load №1 - 65-100W				Load №2 -101 -130 W			Recovery			
		before	after	differe nce	% chan ges	after	differe nce	% change s	2	3	4	5
.1	n =13 judokas Heart rate / min	80± 3,45	99± 2,74	11± 0,71	13± 4,6	111± 1,15	31± 2,99	39± 2,3	94,5± 3,4	91,5± 2,4	88± 2,0	85,5± 3,2
2.	SD mm Hg.	101± 2,6	115± 0,16	14,35± 2,44	17,9± 9,8	115± 5,9	14± 3,4	15,1± 3,6	170± 2,07	100± 0,4	95± 5,7	97± 4,8
3.	DD.mm.Hg.	60,2± 0,6	60± 3,9	-0,2± 3,3	0,3± 0,9	60± 4,1	-0,2± 3,5	0,3± 1,0	58± 4,6	56± 4,8	55± 2,7	52± 2,7
4.	PDmm.Hg	47± 3,2	54± 4,8	7± 4,8	2,12± 3,8	55± 2,3	8± 0,9	17± 1,9	50± 2,5	43± 2,9	40± 3,9	45± 2,7

5.	IOC l/ min	5,791±0,34	7,676±0,42	1,885±0,63	32,5±1,08	8,863±0,23	3,077±0,64	53,1±11,9	7,483±0,31	7,244±0,38	6,634±0,14	6,716±0,19
6.	IOC / min	22±1,1	27±2,3	5±1,2	22,7±4,2	30±2,9	7,3±1,8	33,1±2,5	28±2,0	26±1,6	26±1,6	23±1,3
7.	DO ml.	675±17,2	650±5,75	-25±11,4	-14,8±1,84	612±34,4	84,6±10,2	-12,5±11	622±66,7	607±69	637±57,5	650±57,5
8.	RR l/min	16,1±1,16	13,9±1,8	4,7±0,9	28,0±4,8	12,7±5,2	3,4±4,0	21,2±0,21	13,3±3,2	14,6±1,2	14,5±1,3	14,3±1,4
9.	VC	2,7±0,1	2,5±0,5	0,2±0,04	7,4±1,7	2,4±0,5	0,3±0,06	12,5±2,8	2,55±0,1	2,6±0,1	2,6±0,1	2,65±0,1
10	Breath holding sec.	49,2±6,4	46,5±4,6	27±1,8	54,8±2,8	35,5±2,3	19,3±4,8	39,2±2,4	45±3,9	47±4,8	48±5,0	48±5,5
11	Hand dynamometry brushes pr. Hands	38,1±2,7	36,5±2,8	1,6±0,1	-5,25±3,7	34±1,8	4±0,9	10,5±0,2	35±2,0	36,5±2,3	36,1±2,5	36,7±2,7
12	Hand dynamometry kisti left	30±1,38	30,2±2,07	0,2±0,69	0,6±0,5	32,8±2,76	2,8±1,38	9,3±0,4	31,2±2,53	31,7±2,07	31,2±2,07	31,5±1,61
13	Life index.	35.3	33.8	-1.5	-4.2				33.8±1,37			

Table 1 shows how within 2, 3, 4, 5 minutes after the load, almost all athletes have a gradual normalization of such indicators as HR-heart rate, SD-systolic pressure, DD-diastolic pressure, PD-pulse pressure, IOC-minute blood volume, RR-respiration rate, DO-tidal volume, MOD-minute volume of respiration, VC-vital capacity of the lungs, ZD breath holding, DK-hand dynamometry, MOC-maximum oxygen consumption, PWC170-physical performance. However, compared with the initial values, there was a slight decrease in systolic and diastolic pressure after consecutive 1 and 2 loads. However, in Rakhimovs, Usmonovas, Ganievas, in response to physical activity, hemodynamic parameters are characterized by a decrease in the amplitude of the heart rate reaction, which may be associated with a deterioration in sports form, accompanied by a decrease in physical performance indicators. In athletes after the second load, the indicators of heart rate, IOC decrease, and the frequency of heart rate increases. Such a reaction cannot provide an adequate and effective adaptation of the body to physical activity and indicates the low functional capabilities of the above athletes. The analysis of dynamometry indicators - the strength of the right and left hands in female judokas makes it possible to divide them into 2 groups: 5 girls from the surveyed athletes showed low indicators of hand strength of both the right

and left hands, the values of which fluctuate within 20-28 kg, in the second For the groups of girls, fluctuations in hand strength indicators were from 30-34 kg for the left hand, 34-38 kg for the right hand. For a group of athletes with low arm strength, coaches are advised to use physical exercises aimed at developing the muscles of the shoulder girdle, as well as developing the flexor and extensor muscles of the hand.

Conclusion: Individual monitoring of hemodynamics during the training cycle among female judokas makes it possible to timely correct the training process, as well as purposefully carry out measures to expand the range of adaptive capabilities of not only the muscular system, but also the cardiorespiratory system.

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