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THE PERIOD OF FATIGUE STUDY IN THE TRAINING PROCESS OF WOMEN-BOXERS

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Annotation. The urgency of this problem is conditioned by many factors, which exist in modern sport, and first of all by the popularity of women's boxing as a professional kind of sport. In the scientific literature the problem of physical state rehabilitation after the women-boxers trainings is not studied enough. Self-control helps an athlete to estimate more objectively the abilities of own organism and find independently the reserves for optimal physical loads in the training process and for rehabilitation after the trainings. **Material.** In the article authors pay great attention to the important aspects of a sportsman physical state after the training process, the period of fatigue.

Research methods: scientific literature analysis and summarizing, methods of empiric research (observation, comparison, measurements, experiment). **Results.** During the research the characteristics of the base heart rate parameters were analyzed in order to compare them with own results. During a year a female athlete held the experiment on the powers of an organism rehabilitation using different water procedures: going to bath, swimming-pool, cold shower, cold water washing. The article presents heart rate indices of a weekly training process. On the basis of these indices diagram of a sportsman's physical state self-control is formed. Regular bath attendance considerably improved the coordination during the training process exercises fulfillment and also immune system of a female athlete's organism. Graphically the periods of fatigue, which took place in the organism and cause-and-effect interactions were formed.

Keywords: women's boxing, self-control, loads, heart rate, training process, sport, biomechanics of muscles, fatigue.

Introduction.

The urgency of this problem is conditioned by many factors, which exist in modern sport, and first of all by the popularity of women's boxing as a professional kind of sport. Boxing transformed into a new kind of sport – chessboxing (Y.D. Ovchinnikov, L.V. Khorkova) [10]. Boxing is not only spectacular, but also injury factor kind of sport (Y.P. Dekhtyarev, A.V. Muravskiy, A.A. Klochkova, P.V. Davydov, A.N. Lobov, N.L. Cherepakhina) [3,6]. We should also mention contraindications to going in for

boxing among children with different diseases. This problem has not only scientific character, but for a trainer and a sportsman it has practical importance during the training process organization and in the system of medical-pedagogical observation. In the scientific literature the questions of psychological training in different kinds of combats are discussed enough (I.V. Babanov; V.V. Lisitsin; A.I. Chemezov, G.K. Khomyakov) [2,7,14], and also the emphasis is put on gender differences (D.I. Dzhurniy, A.A. Peredelskiy, R.A. Sultanova)[4,12].

Each trainer has his own opinion concerning boxing lessons and when moving from one trainer to another, changes happen also in the training process, which sportsman, especially the beginner, is not able to stand (Y.D. Ovchinnikov, L.V. Khorkova)[11].

In the scientific literature the problem of physical state rehabilitation after the women-boxers trainings is not studied enough. Self-control helps an athlete to estimate more objectively the abilities of own organism and find independently the reserves for optimal physical loads in the training process and for rehabilitation after the trainings. Mainly the system of medical-pedagogical observation is used (MPO) – research works held together with a doctor and physical culture teacher (trainer) in order to estimate the influence of physical loads on the organism of people, who train, the level of adaptation revelation to increasing training loads. During the research methods choice in order to hold MPO it is necessary to take into account the contingent of sportsmen and the peculiarities of this kind of sport, in order to determine the state of the most loadable functional systems. Medical-pedagogical observations of sportsmen, who train mainly for endurance, provide objective estimation of changes in the work of cardio-vascular and respiratory systems. In speed-power kinds of sport the research methods are chosen, which state the condition of sensory receptors and nervous-muscular apparatus. One of the main objectives of medical-pedagogical observation is the influence of the training loads study on the organism of a sportsman. Approximate notion of a sportsman's organism reaction character to a training load gives heart rate calculation after the separate exercises fulfillment or after the training lesson.

Research methods. During the scientific research the methods of empiric research were used (observation, comparison, measurements, experiment).

Research materials. The student (specialization “Single combat” (women's boxing)) from physical culture faculty of Kuban State University of Physical Culture, Sport and Tourism Lyubov Khorkova held a scientific experiment in terms of scientific-research orientation “Biomechanics in project technologies” [9]. Sports activity analysis of sportsmen shows their orientation to the results of medical-pedagogical observation, practical importance of which is not always took into consideration. As medical-pedagogical observations of training process show, a sportsman has physiological changes in an organism. Most of all scientific literature describes heart rate oscillations (T.S. Aslaev, N.Y. Tokmakova; E.L. Mikhalyuk) [1,8]. During the research the characteristics of the base heart rate parameters were analyzed in order to compare them with own results. Scientific literature defines the variants of sportsmen's organism adaptation to repetitive loads, which are used during scientific research works organization (V.P. Zaytsev, S.M. Artemeva, P.A. Zakharov; D.A. Raevskiy, V.S. Domashchenko, V.S. Kharatov) [5,13]. Sports indices can increase or decrease depending on set for the organism load. Training process effectiveness depends on the choice of the training means and their dosage in one lesson, micro-or mesocycles.

Aim of the research – the period of fatigue study in the training process among women-boxers using the methods of self-control.

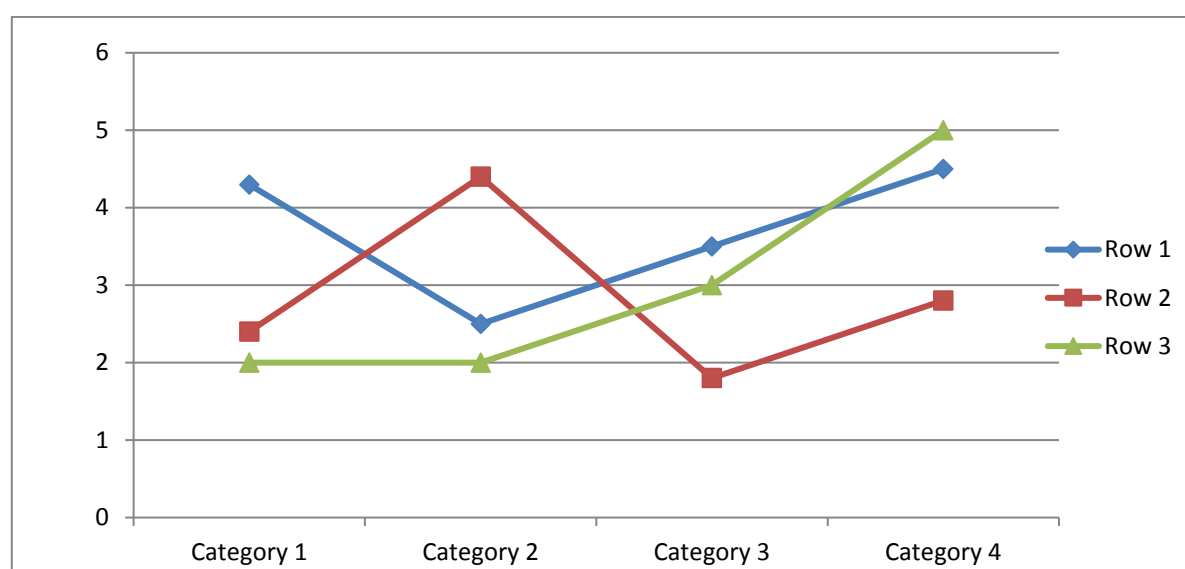
Research results.

The results of heart rate and arterial pressure measurement in different time intervals of the training lesson we will present in a form of “physiological curve”, which reflects the degree of sportsman's tension and the level of load in different parts of the lesson. More precise information about the training lesson influence on the organism can be received while using the method of additional loads.

Table 1 – Heart rate indices during a week of training process

Date	HR at rest (within 10 sec.)	HR with a load (within 10 sec.)	Heart rate of rehabilitation	AP before the load	AP after the load
28.11.16	18	28	21	115/75	121/79
29.11.16	18	26	22	117/79	123/80
30.11.16	20	28	23	115/80	125/82
1.12.16	18	29	23	116/71	129/82
2.12.16	21	30	26	126/70	130/78
3.12.16	20	27	24	124/76	129/78

HR – heart rate; AP – arterial pressure



Picture 1 – Diagram of a sportsman's physical state self-control

Row 1 – AP with a load; Row 2 – HR with a load; Row 3 – HR of rehabilitation

Conclusion. The results of the held measurements showed changes in HR and AP of the athlete. It is conditioned by the fact that during each training different physical loads are used (aerobic and not anaerobic). It should be noted that at the beginning of the week the female athlete is more recovered and the organism is able to fulfill twice more physical exercises (work with a barbell, work with weight, with dumb-bells, squatting with weight, deadlift), restore and percept further physical loads (according to HR indices) quicker, than at the end of the week. Arterial pressure (AP) before the load is low, it shows that a female athlete has bradycardia (heart

rate fall) and after the load AP is the average, which is a norm for boxers.

During a year a female athlete held the experiment on the powers of the organism rehabilitation. For the organism rehabilitation she once a week (Saturday) went to bath and after bath drank tea with honey and nuts. Tea with honey and nuts has general health-improving and tranquilizing effect, normalizes pressure. It was noted that going to bath improves bloodstream in muscles and leads to quick erosion of lactic acid. As a result the female athlete got quick muscles rehabilitation, the period of fatigue decreased. As the experiment showed, the duration of fatigue period is conditioned by nutrition and

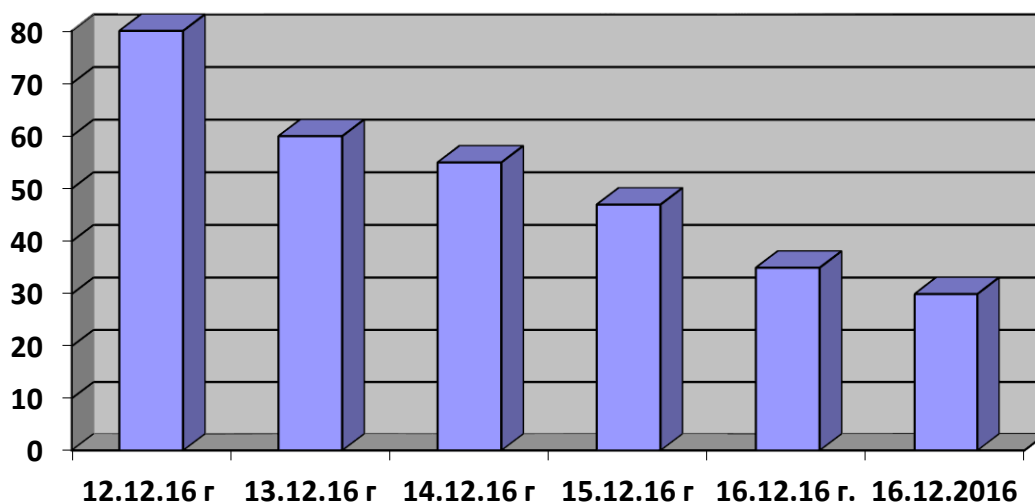
sleep. A normal period of sleep was (8-8,5 hours). Nutrition included different kinds of cereal, proteinic food, half an hour before the combat she ate a piece of bitter chocolate. Regular going to bath considerably improved coordination for exercises fulfillment in the training process. As a result less energy is needed, endurance increased, duration of the trainings increased for 20 minutes. This fact a female athlete connects with nervous and immune systems strengthening. The system of different temperature regimens influence is created in a bath, taking into consideration the state of muscles. Adaptation to temperature regimens was gradual.

Experimentally it was revealed, that going to bath once a week was enough for the organism of a woman, in order to recover muscles tonus after trainings during a week. Different days of the week were used, but finally the end of the week was chosen – Saturday, as during this period not only physical, but also psychological fatigue is felt. At the end of the week she summarizes the results of her training activity. With the temperature 90-110 degrees protein synthesis, muscular tissue increase and rehabilitation slow down, working capacity and power of muscles increase (in sport- muscles and skin cleaning).

The female athlete used water procedures for strength rehabilitation: cold water washing, cold shower and swimming in the swimming pool after bath. Cold water washing stimulates and invigorates, as oxygen comes to blood and tissues. Cold shower with the temperature 20-30 degrees influences muscles growth, increasing muscles mass, decreases pressure, but doesn't eliminate load on a spine, as in a shower person is in a vertical position. Load on a spine was eliminated in a swimming pool. After bath she went to a swimming pool. It turned out to be more useful for an organism, than a shower:

- spine muscles and other parts of the body tone increase;
- muscle corset is strengthened;
- oxygen is delivered to the tissues by means of microcirculation increase in them;
- the processes of muscle tissue, vessels and nerve fibers regeneration improve;
- intervertebral distance increases, which decreases pressure on intervertebral disks and on spinal roots;
- dizziness, headaches are prevented, the activity of lower extremities improves;
- general state of an organism stabilized.

12.12.16 – at the 80th minute 13.12.16 – at the 60th minute 14.12.16 – at the 55th minute
15.12.16 – at the 47th minute 16.12.16 – at the 35th minute 16.12.16 – at the 30th minute



Picture 2 – Fatigue indices during a real training time

The diagram shows the periods of fatigue of a female athlete.

It is seen that to the end of the week the period of fatigue increases.

Rehabilitation procedures are in the following.

Half an hour before the trainings she eats a piece of bitter chocolate, follows the regimen of sleep and nutrition. After rehabilitation procedures at week-ends the fatigue index is almost absent, as the main training lasts 2 hours, during the first day the athlete was tired at the 80th minute, this fact is characterized by the fact that muscles are not so “stuffy” and relaxed, organism is able to cope with physical load. On the second day there was the average working capacity, on the 3rd and the 4th day muscles lost their tonus and it proves that the organism was tired, on the 5th and the 6th day muscles and the organism in general get tired after warming-up and preparatory work.

The research works show, that under the influence of regular physical exercises a person's muscles increase in volume, become stronger, their flexibility increases; the number of functioning capillaries (which at rest are “sleeping” and blood can't move through them) in the muscles increases. During muscular retractions capillaries open and blood starts to move in them. As a result, venostasis decreases, general volume of circulating blood increases and oxygen provision in organs and tissues also improves.

Conclusion. In the future the female athlete plans to continue scientific study of own physical state after training loads and her research work will concern the change of sugar level in blood.

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