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The construction of the training process of young weight lifters 12–13 years old during a one-year macrocycle, taking into account the specific biological cycle

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Purpose: *to consider the question of building the training process of young weight lifters of 12–13 years during a one-year macrocycle, taking into account the peculiarities of a specific biological cycle.*

Material & Methods: *the methods of theoretical analysis and generalization of scientific information, system analysis are used in the work.*

Results: *modern approaches to constructing the training process of young weight lifters of 12–13 years are presented, a detailed structure of the construction of a one-year macrocycle taking into account the CMC phases is presented.*

Conclusions: *it was determined that for young athletes involved in kettlebell lifting, it is necessary to carry out a detailed load distribution in accordance with the phases of the CMC during a one-year macrocycle, and it is necessary to take into account loads in basic and competitive mesocycles.*

Keywords: *young athletes, specific biological cycle, CMC phases, microcycles, mesocycles.*

Introduction

Modern sport is characterized by a steady increase in sports achievements, accompanied by an increase in the volume and intensity of the training load. Such an approach to the training process often leads to overstrain of regulatory systems, the depletion of the adaptive reserve and the reduction in the time for athletes to perform, does not allow to achieve high sports results. The functioning of physiological systems and adaptation processes in the body of women differ from those in men. This is due to one of the main biological characteristics of the female body associated with reproductive function – the cyclical functions of the hypothalamic-pituitary-ovarian-adrenal system. A number of studies (A. G. Radzievsky, 1990; F. A. Iordansky, 2012; V. V. Mulik, 2001; 2016; L. Ya.-G. Shakhlin, 1995–2014), including foreign ones (A. M. Burrows, S. R. Bird, 2005; S. B. Da Silva, 2006; A. J. Anderson, M. A. Babcock, 2008) focuses on the effects of sex hormones in women's athletic training. Experts have determined the dependence of the manifestation of the performance of athletes of various sports specializations and the reaction of their body depending on changes in the concentration of sex hormones during the menstrual cycle (MC) (V. V. Mulik, 2001; V. M. Platonov 2004; M. S. Prudnikova, 2009) [4; 9; 10].

Purpose of the study: to consider the construction of the training process of young kettlebell-lifter 12–13 years old during a one-year macrocycle, taking into account the characteristics of a specific biological cycle.

Material and Methods of the research

Research methods: according to the methodological approach to solving the problem and tasks, the research program included a set of research methods: analysis of scientific and methodological literature, determination of special physical fitness using pedagogical testing of young kettlebells, pedagogical testing of the training process and methods of mathematical statistics.

Organization of the study: in this study, young pupils of Children's and Youth Sports School No. 16 and Children's and Youth Sports School No. 8, Kharkov, participated. The experiment involved 30 young kettlebell-lifter female athletes aged 12–13 years, who were divided into control and experimental groups of 15 athletes in each group. Participants in the experiment trained 3-4 times a week according to the developed methodology.

Experimental studies were carried out at the training base of Children's and Youth Sports School No. 8 and the Children's and Youth Sports School No. 16.

Results of the research

Athletic training of young female athletes involved in weightlifting involves the use of tools and methods that influence the development of such physical qualities as strength, endurance and speed-power training. Under the influence of training in the body athletes undergo certain changes. In the process of adaptation to physical activity, the level of physical performance and fitness of the female athlete increases. Muscle hypertrophy is one of the manifestations of the body's adaptation to power. However, in order for the changes in the body of female athletes to have a positive character, the trainer must choose the optimal mode of training, taking into account the ovarian-menstrual cycle and properly selected rest, correctly select the recovery procedures that contribute

to faster growth of athletic skills.

At that time, today, there is no research on the construction of a one-year macrocycle for training young athletes involved in kettlebell lifting, taking into account the ovarian menstrual cycle, which takes into account the use of loads in the phases of the ovarian menstrual cycle.

At the beginning of the research, young athletes involved in kettlebell lifting were divided into two groups of 15 people each. The female athlete of the experimental group trained according to the developed experimental technique, which provided for the phase of the ovarian-menstrual cycle in the training process of taking into account the loads in the annual macrocycle.

Sports training involves the use of training means and methods aimed at improving the level of development of physical qualities. Long-term exposure to stresses on the body causes changes in the functional state of organ systems, as a result of which the general level of fitness and physical performance increases. However, in order for the influence of playing sports to be positive, the trainer should select an adequate level of load taking into account the phases of the ovarian-menstrual cycle, taking into account the individual characteristics of the athletes [3–7].

Considering the recommendations of leading experts in the field of building the training process for training athletes (V. M. Platonov, 2004; V. V. Mulik, 2017), it is reasonable to build a two-cycle summer training for young athletes involved in kettlebell lifting, taking into account the CMC profession during a one-year macrocycle.

In our study, the construction of a one-year macrocycle for training young athletes is based on the generally accepted theory of periodization (V. M. Platonov), which provides for the separation of the macrostructure into preparatory, competitive, and transitional periods, and when a menarche appears, we developed an experimental method for constructing mesocycles, taking into account ovarian phases menstrual cycle.

So, the *first macrocycle*, lasting 24 weeks (June 2017 – November 2017), had in its structure a preparatory period (June – September 2017), which consisted of two stages of general and specially preparatory, in which the training load gradually increased (Table 1).

The planning of the training process in the *general preparatory stage* (duration 12 weeks) included one retractor and two basic mesocycles. The basic mesocycle was of an experimental nature, where the phase of the ovarian-menstrual cycle was taken into account in the training process, and the tasks of the mesocycle provided for the creation of prerequisites for further hard work related directly to increasing the number of lifting weights and using other power devices.

The *special preparatory stage* (duration 4 weeks) is characterized by the predominant use of specialized exercises with the use of static, combined and semi-dynamic training modes, which allow to improve the weight lifting of young athletes. The special-preparation mesocycle consisted of retracting, shock, and reducing microcycles.

The structure of the competitive period, lasting 8 weeks (October – November 2017) of the annual cycle, has pre-competitive and competitive mesocycles, including retracting, underwater and competitive microcycles.

The *second macrocycle* (lasting 24 weeks, December 2017 – April 2018) in terms of its objectives and content is an organic continuation of the first macrocycle, the preparatory period of which was 12 weeks (December 2017 – February 2018).

The *B-preparatory stage* (duration 8 weeks, December-January) included two mesocycles: the retractor and the base one. The basic mesocycle was experimental in nature, where the phases of the ovarian-menstrual cycle in the training process were taken into account, the tasks of the mesocycle also provided for the creation of prerequisites for further hard work related directly to building strength and speed-strength qualities. The structure of the special preparatory stage, (duration 4 weeks), had a formative character and included a “special preparatory” mesocycle.

The *special preparatory stage* is characterized by the predominant use of highly specialized exercises and the use of static, combined and semi-dynamic training modes, as well as by practicing the exercise of lifting weights by the number of times per minute. The special-preparation mesocycle consisted of a restorative microcycle, a retractor, shock, and restorative. This stage created the prerequisites for recovery after the base mesocycle.

The structure of the *competitive period* (duration of 8 weeks) is formative. The load volume is reduced, special attention is paid to working out the technical lifts of the weight by a number of times. The objective of this period is to achieve the best peak shape of young athletes. The structure of the competitive period of the annual cycle has pre-competitive and competitive mesocycles, including underwater and competitive

Table 1

The structure of the annual dual macrocycle of young female athletes, 12–13 years old, taking into account the biological cycle

Macrocycles	I						II					
Periods	Preparatory				Competitive		Preparatory			CM		ПРХ
Stages	G-P			SP	CM		G-P		SP	CM		RS
Mesocycles	RT	B-1	B-2	SP	П3	3M	RT	B-2	SP	PC	CM	PC
Months	VI	VII	VIII	IX	X	XI	XII	I	II	III	IV	V
OMC	W	X	X	W	X	W	W	X	W	X	W	W

Remark. *Mesocycles: KT – retractor; B-1 – basic (general physical fitness); B-2 – basic (special physical training); SP – specially preparatory; PC – precompetitive; CM – competitive; RS – Renewable-supportive. B – without taking into account the phases of the ovarian-menstrual cycle; X – taking into account the phases of the ovarian-menstrual cycle.*

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microcycles.

The *transition* period involves the restoration of the body after training and competitive activity.

The proposed approach to planning a one-year training macrocycle for young weight-lifting athletes, taking into account the phases of the ovarian-menstrual cycle, became the basis of the experimental group training program for young athletes involved in kettlebell lifting.

The experimental results were as follows.

Testing the level of special physical preparedness for athletes 12–13 years old, engaged in weight lifting, was carried out using special and special preparatory exercises: deadlift with 24 kg of weight; squats with 24 kg of weight; a jerk of a weight of 8 kg in 10 minutes and weight on the crossbar (Table 2).

An analysis of the manifestations of special physical preparedness in athletes 12–13 years old at the beginning of a one-year macrocycle showed that the differences in results were not significant: in a jerk of a weight of 8 kg (control – 15,4 times, experimental – 16,1 times; P>0,05); squats with 24 kg of weights (respectively – 12,5 times, 12,1 times; P>0,05) deadlift with 24 kg of weights (control – 35,2 times, experimental 34.8 times; P>0,05) hanging on the crossbar (36,4 s, 35,2 s, respectively; P>0,05) (Table 2).

During the study, at the end of the one-year macrocycle for 12–13-year-old female athletes involved in kettlebell lifting, the difference between the indicators was likely: in a jerk of a weight of 8 kg (control – 22,1 times, experimental – 30,2 times (t=2,17 P<0,05) squats with 24 kg of weights (respectively – 18,7 times, 26,6 times (t=2,37; p<0,05); deadlift with 24 kg of weights (control – 41,2 times experimental 47,8 times (t=2,24; p<0,05) hanging on the crossbar (38,2 s, respectively, 40,2 s (t=2,31; p<0,05) (Table 3).

Conclusions / Discussion

An analysis of the scientific literature confirmed that research in the field of kettlebell lifting was mainly of a special nature. In recent years, scientists have conducted studies on the content and methodology of the training process of young female athletes 12–13 years old with various methods of improving motor skills and power qualities (Yu. V. Verkhoshansky [1]), planning the training process during the annual macro cycle of athletes 12–15 years (V. M. Platonov [8–9]) and the influence of the training process of young female 12–13-year-old weight-lifting athletes on manifestations of physical qualities (N. S. Ipolitov). However, the influence on the performance of young 12–13-year-old weight-lifting athletes was not studied at the first stage of training in many years of training, which prompted us to develop a training process for young 12–13-year-old weight-lifting weights during a one-year macrocycle taking into account ovarian-menstrual phases.

Today, there are a number of scientific studies that address the features of the construction of the training process of sportswomen on the basis of taking into account working capacity at different periods (phases) of a specific biological cycle. Fundamental are the works of A. G. Radzievsky, Yu. T. Pokolenchuk, N. V. Svechnikov, B. P. Pangelov, T. A. Lozy, S. K. Fomina, A. Ya. Kvale, Yu. A. Karp, L. Ya.-G. Shakhlin, which determined the functional state of athletes during a specific biological cycle. To a lesser extent, the issues of building the training process of young athletes are studied, especially during the formation of a specific biological cycle.

The experimental training program, which was developed for 12–13-year-old weight-lifting athletes, taking into account the phases of the ovarian-menstrual cycle, provided for a dual structure of annual training, which included two macrocycles: the first, which should be preparatory (general construction preparatory, special preparatory stages) and competitive (competitive stage) periods; the second, with the presence of

Table 2

Average indicators of the results of special physical preparedness of young athletes of 12–13 years of age engaged in kettlebell lifting, taking into account the OMC phases at the beginning of the annual macrocycle (n_1=n_2=15)

Indicators	CG	EG	*T*	*P*
	$\bar{X}$±m			
8 kg kettlebell jerk for 10 minutes, times	15,4±2,29	16,1±2,40	0,21	>0,05
Squats with 24 kg of weight, times	12,5±2,57	12,1±2,57	0,11	>0,05
Deadlift with 24 kg of weight, times	35,2±2,05	34,8±2,12	0,13	>0,05
Hanging on the bar, s	36,4±0,96	35,2±0,85	0,94	>0,05

Table 3

Average growth rates of the results of special physical fitness of young athletes 12–13 years old, engaged in kettlebell lifting, taking into account the CMC phases at the end of the annual macrocycle (n_1=n_2=15)

Indicators	CG	EG	*T*	*P*
	$\bar{X}$±m			
8 kg kettlebell jerk for 10 minutes, times	22,1±2,36	30,2±2,89	2,17	<0,05
Squats with 24 kg of weight, times	18,7±2,20	26,6±2,46	2,37	<0,05
Deadlift with 24 kg of weight, times	41,2±2,25	47,8±1,90	2,24	<0,05
Hanging on the bar, s	38,2±0,66	40,2±0,56	2,31	<0,05

the preparatory (general construction preparatory and special preparatory stages) and competitive (competitive stage) and transitional (restoration phase) periods.

As means of training, competitive and competitive auxiliary exercises were used, which were used differentially depending on the phases of the ovarian-menstrual cycle according to the developed training program for a one-year macrocycle.

The introduction of the training methodology for young 12–19-year-old weight-lifting athletes during the annual macrocycle, taking into account the phases of the ovarian-menstrual cycle, contributed to a significant increase in the rates of competitive and competitive auxiliary exercises in the experimental group.

During the study, at the end of the one-year macrocycle for 12–13-year-old female athletes involved in kettlebell lifting, the difference between the indicators was also probable: in a 8 kg kettlebell snatch ($t=2,17$; $p<0,05$); squats with 24 kg of weight ($t=2,37$; $p<0,05$); deadlift with 24 kg of weight ($t=2,24$; $p<0,05$); hanging on the crossbar ($t=2,31$; $p<0,05$).

The study confirmed the results of other authors [1; 2] about the need to take into account the impact of training on the physical performance of athletes 12–13 years old at the initial training stage. Domestic data were also expanded [4–5; 8; 9; 11] and foreign authors [16–22] on issues of increasing the level of the most significant indicators of physical qualities of athletes involved in kettlebell lifting.

The prospect of further research involves determining the construction of the training process for young 12–13-year-old weight-lifting athletes in separate mesocycles that take into account the OMC phases.

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