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CONSTRUCTION OF THE TRAINING PROCESS OF ATHLETES IN PREPARATION FOR THE CROSS-SEASON, TAKING INTO ACCOUNT THE CYCLICITY OF CHANGES IN THE FEMALE BODY

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Abstract

Topicality. An important issue of sports training of long – distance runners is the construction of a program of training sessions, micro cycles and mesocycles on the basis of the ovarian-menstrual cycle. **Objectives of the Work** – to build the training process of long – distance runners in preparation for the cross-season (at the stage of specialized basic training), taking into account the cyclicity of changes in the female body. **Methodology of the Work** – analysis of scientific and methodological literature, content analysis (study of official documents – protocols of competitions, diaries), pedagogical testing for the training process. **Results of the Work** – the autumn-winter macro cycle training of long – distance runners for the Ukrainian athletics cross-country championship is presented. Its structure is revealed on the basis of periods, stages and mesocycles. The structure and content of the individual program of racing work of athletes in the basic developing mesocycle based on the phases of the ovarian-menstrual cycle are determined. **Conclusions.** It is determined that during the construction of the training process of long – distance runners in preparation for the cross season, it is necessary to consider not only sports specialization, physical and functional preparedness, but also the cyclic changes of the female body.

Key words: long distances running, cross, running work, ovarian-menstrual cycle.

Тетяна Маленюк, Наталія Собко. Побудова тренувального процесу легкоатлеток під час підготовки до кросового сезону з урахуванням циклічності змін жіночого організму. Актуальність. Важливим питанням спортивної підготовки легкоатлеток-стаєрів є побудова програми тренувальних занять, мікроциклів і мезоциклів на основі фаз оваріально-менструального циклу. **Завдання роботи** – побудувати тренувальний процес легкоатлеток-стаєрів під час підготовки до кросового сезону (на етапі спеціалізованої базової підготовки) з урахуванням циклічності змін жіночого організму. **Методологія проведення роботи** – аналіз науково-методичної літератури, контент-аналіз (вивчення офіційних документів – протоколів змагань, щоденників), педагогічне тестування за тренувальним процесом. **Результати роботи.** Представлено осінньо-зимовий макроцикл підготовки легкоатлеток-стаєрів до чемпіонату України з легкоатлетичного кросу. Розкрито його структуру на основі періодів, етапів і мезоциклів. Проаналізовано структуру й зміст індивідуальної програми бігової роботи легкоатлетки в базовому розвивальному мезоциклі на основі фаз оваріально-менструального циклу (ОМЦ). Виявлено, що спортсменка належить до високого рівня «жіночності» із тривалістю ОМЦ 28 днів. Узгоджено обсяг та інтенсивність тренувального навантаження легкоатлетки з фазами ОМЦ, що пов'язано з високим ступенем їх впливу на показники функціонального стану. Визначено особливості бігової роботи спортсменки відповідно до фаз ОМЦ: у менструальній, овуляторній і передменструальній фазах – відновні мікроцикли з біговим навантаженням аеробного й анаеробно-аеробного характеру, у постменструальній і постовуляторній – ударні мікроцикли з навантаженням анаеробного, анаеробно-аеробного та швидкісно-силового характеру. **Висновки.** Визначено, що під час побудови тренувального процесу легкоатлеток-стаєрів під час підготовки до кросового сезону потрібно враховувати не лише спортивну спеціалізацію, фізичну й функціональну підготовленість, але й циклічності змін жіночого організму.

Ключові слова: біг на довгі дистанції, крос, бігова робота, оваріально-менструальний цикл.

Татьяна Маленюк, Наталья Собко. Построение тренировочного процесса легкоатлеток при подготовке к кроссовому сезону с учетом цикличности изменений женского организма. Актуальность. Важным вопросом спортивной подготовки легкоатлеток-стайеров является построение программы тренировочных занятий, микроциклов и мезоциклов на основе оваріально-менструального цикла. **Задание работы** – построить тренировочный процесс легкоатлеток-стайеров при подготовке к кроссовому сезону (на этапе специализированной базовой подготовки) с учетом изменений женского организма. **Методология**

проведения работы – анализ научно-методической литературы; контент-анализ (изучение протоколов соревнований, дневников), педагогическое тестирование за ходом тренировочного процесса. **Результаты работы.** Представлен осенне-зимний макроцикл подготовки легкоатлеток-стайеров к чемпионату Украины по легкоатлетическому кроссу. Раскрыта его структура на основе периодов, этапов и мезоциклов. Проанализирована структура и содержание индивидуальной программы беговой работы легкоатлетки в базовом развивающем мезоцикле на основе фаз овариально-менструального цикла (ОМЦ). Определяется, что спортсменка принадлежит к высокому уровню «женственности» с длительностью ОМЦ 28 дней. Согласованы объем и интенсивность тренировочной нагрузки легкоатлетки с фазами ОМЦ, что связано с высокой степенью их влияния на показатели функционального состояния. Определены особенности беговой работы спортсменки в соответствии с фазами ОМЦ: в менструальной, овуляторной и постовуляторной фазах – восстановительные микроциклы с беговой нагрузкой аэробного и анаэробно-аэробного характера; в постменструальной и постовуляторной – ударные микроциклы с нагрузкой анаэробного, анаэробно-аэробного и скоростно-силового характера. **Выводы.** Установили, что при построении тренировочного процесса легкоатлеток-стайеров во время подготовки к кроссовому сезону необходимо учитывать не только спортивную специализацию, физическую и функциональную подготовленность, но и цикличность изменений женского организма.

Ключевые слова: бег на длинные дистанции, кросс, беговая работа, овариально-менструальный цикл.

Introduction. The main task of long-distance runners training process is to increase the energy capacity of the human body, the ability to maintain a high level of oxygen consumption without the progressive lactate accumulation in the blood [9].

In special literature, the dependence between the achievement of the maximum result in long distance running and the degree of oxygen consumption is proved. As to highly skilled long-distance runners, the sports results are significantly influenced by the cost-effectiveness of running (more effective runner has lower oxygen consumption than less effective one). The achievement of the maximum result in long distance runners is due to the high level of the development of cardiorespiratory endurance, which is associated with the aerobic capabilities of athletes [18].

Therefore V. D. Polishchuk [13] suggests observing the following correlation of work types in the training process of long-distance runners: aerobic – 60%; anaerobic (glycolytic) – 20%; high-speed, speed-strength – 10%; development of flexibility and coordination abilities – 10%.

Scientists [1] claim that in order to increase the scope of long-distance runners' aerobic and anaerobic systems of energy supply, it is necessary to use running exercises of various duration in the training process: from 12 – 20 km to short-term exercises of high intensity from 5 – 25 to 30 – 60 s. The development of special high-speed and speed-strength endurance is carried out with the help of various jogging exercises, their combination, running uphill. For the development of special endurance the exercises which are as close as possible to the competitive activities by their structure and influence on functional systems of the human body are used.

In order to increase the sports results in long-distance running, it is necessary to use basic training means with high intensity (at least 80% of the maximum personal result) in the training process. This approach allows to develop the ability to quickly run the finish line being tired. The best means to improve the ability to runners' quickly finish is the use of Fartlek and pace running [17].

In training long-distance runners, the percentage of means of strength and speed-strength training increases significantly. Therefore, experts [2] have developed and offered to use at work-out sessions of qualified long-distance runners to use the means that contribute to their development.

Scientists [1; 2; 8] unanimously claim that the formation of special preparedness of long-distance runners is carried out with the use of different predominant orientation means, but with the emphasis on running aerobic and anaerobic aerobic means.

One of the important issues in training female long-distance runners is building-up a training sessions program, microcycles and mesocycles on the basis of the ovarian-menstrual cycle (OMC) [4; 6; 10; 15]. Significant contribution to the study of the female athletes training process on the basis of cyclic changes in their hormonal status was made by L. G. Shakhlina [19].

The impact of the biological cycle on the results of female athletes specializing in endurance sports is larger, as compared with female sprinters. Biological rhythms in the female body are closely related to their ability to work [20]. The proper use of the OMC phases, rational selection of means and methods

according to individual characteristics, taking into account the sports specialization of female athletes, are important factors to effectively design training sessions [10].

In their academic papers experts [2; 15; 16] reveal the main issues of building-up the middle- and long-distance runners training sessions at the stage of maximal realization of individual possibilities. Specialists assume that long-distance runners quite often take part in cross-country running competitions. At the same time, the analysis of special literature showed a small number of studies [12] concerning the training process of female long-distance runners in preparation for the cross-country season at the stage of specialized basic training. A preliminary study on the design of the individual training program of running activity of female long-distance runners in preparation for the cross-country season at the basic training stage [11] can be improved by taking into account the cyclicity of changes in the female body. This factor has contributed to the topicality of our research.

Connection of the research with scientific programs, plans, themes. This research is undertaken in accordance with the plan of research work of the Department of Theory and Methodology of Olympic and Professional Sport of the Volodymyr Vynnychenko Central Ukrainian State Pedagogical University (Kropyvnytskyi).

The purpose of the research is to build up a training session for female long-distance runners in preparation for the cross-country season (at the stage of specialized basic training) with relation to the cyclicity of changes in the female body.

Objectives of the research:

1. To analyze the academic and methodological literature on the subject of the research.
2. To build up the autumn-winter macrocycle of female athletes specializing in long-distance running in the process of preparation for the Ukrainian Track-and-Field Cross-Country Championship at the stage of specialized basic training.
3. To reveal the structure and content of individual running activity of female athletes (on the example of the base developing mesocycle) with relation to the cyclicity of changes in the female body.

Material and methods of research. The research was conducted at the Faculty of Physical Education of Volodymyr Vynnychenko Central Ukrainian State Pedagogical University during the 2016–2017 academic year. 4 First-Class female long-distance runners, 19– 20 years old, who are the members of the regional track-and-field team, took part in the research.

The individual program of female athlete's running activity (age - 20, sports qualification – First Class for cross-country running, First Class for long-distance running - 3000 m) in the process of preparation for the autumn-winter cross-country season is presented in this research.

According to the methodological approach, the following methods have been used in the research: : the analysis of scientific and methodological literature, content analysis (study of official documents – result cards, diaries), pedagogical testing for the training process.

Research results. Discussion. During the research, we built the autumn-winter macrocycle of long-distance runners training for the Ukrainian Track-and-Field Cross-Country Championship. The following mesocycles have been singled out in the structure of this macrocycle,: 1– retracting (35 days), 2 – basic developing (28 days), 3 – basic stabilizing (28 days), 4 –control-preparatory (14 days), 5 – competitive (35 days) and 6 – transitional (14 days) (Table 1).

When planning the individual program of the athlete's running activity in each mesocycle, we took into consideration her sports specialization, physical and functional preparedness, cyclic changes in the female body, as well as the planned result at the Ukrainian Cross-Country Championship.

The female athlete belongs to a high level of “femininity” with the 28 days of OMC duration. When building up the program for running activity in mesocycles, recommendations of S. H. Vasin were taken into account [4]. The scientist emphasizes the advisability of strict concordance of the volumes of training load with the phases of the OMC, especially for the female athletes with high level of “femininity”, which is related to a high degree of OMC influence on the changes in their subjective assessment of the functional status.

In this research, we suggest the structure and content of individual running activity in the basic developing mesocycle of the female athlete's training for the cross-country season during the OMC containing five microcycles corresponding to the phases of the OMC (Table 2).

Table 1

**The Structure of the Autumn-Winter Macrocycle of Long-Distance Runners Training
for the Ukrainian Track-and-Field Cross-Country Championship**

Cycle	Preparatory			Competitive	Transitional	
Stages	General preparation	Specific preparation		Pre-competitive	Competitive	Recovery
Mesocycles	Retracting	Basic developing	Basic stabilizing	Control-preparatory	Competitive	Recovery

The results of our research supplement the data of V. D. Yeroshchev [7], who claims that in the 1st, 3rd and 5th phases of the OMC, recovery microcycles with running load of aerobic and anaerobic-aerobic character should be planned, while in the 2nd and 4th – impact microcycles with a running load of anaerobic and speed-strength character.

Table 2

The Structure and Content of Running Activity in the Basic Developing Mesocycle

Days	Content of training sessions
1	2
Retracting microcycle (Phase I – menstrual)	
1 st	Cross – 20 min (HB 140 bpm ⁻¹)
2 nd	Run 4x200 after 4 min rest (80 %)
3 rd	Run 5-6 km slowly
4 th	Run 150x200x300x200 x150 (80 %)
5 th	Fartlek 5-6 km (acceleration is in general 1 km)
Impact microcycle (Phase II – postmenstrual)	
6 th	Cross – 20 min (HB 150 bpm ⁻¹)
7 th	Run 4x400 m after 7 min rest (90 %)
8 th	Cross – 20 min (HB 150 bpm ⁻¹)
9 th	Run 4x300 m after 5 min rest (85 %)
10 th	Run 5-6 km slowly
11 th	Run 2 series 4x100 m after 3-2-1 min rest (90 %)
12 th	Cross – 30 min (HB 150 bpm ⁻¹)
Retracting microcycle (Phase III – ovulatory)	
13 th	Run 8x100 m after 3 min rest (80 %)
14 th	Cross – 20 min (HB 140 bpm ⁻¹)

End of table 2

1	2
15 th	Run 3x800 m after 7 min rest (75 %)
Impact microcycle (Phase IV – luteal)	
16 th	Cross-country race 20 min (HB 160 bpm ⁻¹)
17 th	Run 4x400 m after 5 min rest (85 %)
18 th	Cross – 30 min (HB 150-160 bpm ⁻¹)
19 th	Run 2x1000 m after 9 min rest (85 %)
20 th	Run 5-6 km slowly
21 st	Run 2 series 4x100 m after 3-2-1 min rest (90 %)
22 nd	Cross – 30 min (HB 150-160 bpm ⁻¹)
23 rd	Run 2 series 4x100 m after 1-2-3 min rest (85 %)
24 th	Long run 7-8 km (to 150 bpm ⁻¹)
Retracting microcycle (Phase V – premenstrual)	
25 th	Run 4-5 km at a medium pace
26 th	Cross 10-12 km (140-160 bpm ⁻¹)
27 th	Run 5-6 km slowly
28 th	Day-off

When planning the workload during the mesocycle we followed the recommendations of V. R. Budzyn [3], Y. P. Vrublovskiy [5], O. B. Rody [14] and T. V. Samolenko [15], who emphasize that the maximum workload should be performed in the luteal and postmenstrual phases, and in the premenstrual and menstrual phases the workload must be reduced.

The analysis of specialized literature and trainers' experience has not allowed us to reach a unanimous decision on the necessity and appropriateness of training sessions for female athletes in the menstrual phase. However, we were planning training sessions for the female athlete in the first phase of OMC according to the results of Y. V. Hornostaieva research [6], who asserts that 81.6% of female athletes training in the menstrual phase have improved their sports results. Y. P. Vrublovskiy [5] also points out that 78.5% of trainers consider training sessions in the 1st phase of OMC mandatory.

According to the undertaken researches [10], luteal and postmenstrual phases are chosen for the development of speed-strength, speed, coordination abilities and special endurance. It is appropriate to use a supportive exercise mode in the premenstrual phase, which is also reflected in the mesocycle compiled by us.

Conclusions

1. The analysis of special literature proves the necessity of taking into consideration sports specialization, physical and functional preparedness and cyclicity of changes in the female body while building up the training process of female long-distance runners, preparing for a cross-country season at the stage of specialized basic training.

2. The autumn-winter macrocycle of training female long-distance runners for the Ukrainian Track-and-Field Cross-Country Championship is presented, taking into account the basic theoretical and methodological principles of building the training process. The structure of macrocycle contains periods, stages, and mesocycles.

3. The structure and content of individual running work are revealed through the example of a basic developing mesocycle of the female athlete training for the cross-country season. The peculiarities of running activity with relation to the phases of the OMC are defined: in the menstrual, ovulatory and

premenstrual phases – recovery microcycles with loading of aerobic and anaerobic-aerobic character, while in postmenstrual and luteal – impact microcycles with a load of anaerobic, anaerobic-aerobic and speed-strength character.

Further research is suggested to find out individual characteristics of the reaction of female athletes' body throughout all phases of the OMC and to determine, according to this, the volume and nature of the performed workload.

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