

• ДИТЯЧИЙ ТА ДИТЯЧО-ЮНАЦЬКИЙ СПОРТ

• CHILDREN AND YOUTH SPORTS

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**USING OF VARIOUS TRAINING MODES
IN WORKOUTS FOR ROWERS
DURING THE PRE-BASIC TRAINING****Victoria BOHUSLAVS'KA, Kostyantyn SHVETS***Vinnitsja State Pedagogical University
named after M. Kotsiubynskij, Vinnitsja, Ukraine***ВИКОРИСТАННЯ РІЗНИХ РЕЖИМІВ ТРЕНУВАНЬ У ФІЗИЧНІЙ ПІДГОТОВЦІ ВЕСЛУВАЛЬНИЦЬ НА ЕТАПІ ПОПЕРЕДНЬОЇ БАЗОВОЇ ПІДГОТОВКИ. Вікторія БОГУСЛАВСЬКА, Костянтин ШВЕЦЬ.** *Вінницький державний педагогічний університет ім. М. Коцюбинського, Вінниця, Україна*

Анотація. Статтю присвячено вивченню впливу фізичних вправ, які цілеспрямовано стимулюють аеробні та анаеробні процеси м'язової роботи, для поліпшення функціональної і фізичної підготовленості дівчат-байдарниць. Мета дослідження полягала в розробці програм тренувальних занять із веслування на байдарках із різним режимом енергозабезпечення, спрямованих на вдосконалення функціональної та фізичної підготовленості спортсменок на етапі попередньої базової підготовки. В експерименті брали участь 45 дівчат віком 14–15 років, спортивний стаж яких становив 3–4 роки, кваліфікація II – III спортивні розряди. Установлено, що робота у змішаному режимі енергозабезпечення (аеробно-анаеробному й анаеробно-аеробному) більш ефективна, ніж в аеробному.

Ключові слова: веслування на байдарках, фізична й функціональна підготовленість, режим енергозабезпечення, етап попередньої базової підготовки.

Statement of the problem. Analysis and synthesis of literature resources suggests that the problem of athletes' functional and physical fitness improving in rowing at the stage of preliminary basic training is a key one. Studying the effect of different modes of exercises on functional and physical fitness and athletic performance of women-rowers in the pre-basic training session enhances the opportunities of establishment and improvement of comprehensive training programs, the using of which will promote rowers' effective sportsmanship growth.

Analysis of recent researches and publications. Regardless of the multi-stage training of athletes the training process should be directed to adaptive changes in the one's body, the specificity of which is caused by power provision mode of muscle work [5, 6]. Taking this into consideration rowers training session should be focused on the improving of those individual's systems which ensure aerobic and anaerobic capacity [4, 5, 7]. The effectiveness of such trainings are largely dependent not only on the stimulation of aerobic and anaerobic metabolism during physical work but also on the age and sex of the athletes. The pre- basic training of rowers coincides with puberty human ontogenesis characterized by biochemical, morphological and functional changes in the young athletes' bodies associated with not only physical loadings, but with the intensive age changes of the body that should be considered during the physical training of athletes[8].

At the rates of age changes of the organism during the pubescent period of ontogeny girls are far ahead of boys. However, the coach has to take into account the physical performance of athletes depending on the phase of the menstrual cycle. Training sessions that do not meet some functional abilities of girls, especially during puberty, can cause not only some decrease in athletic performance but also various health impairments [3, 5, 6].

As stated above, **the aim of our study** was to develop some training session programs in rowing with various modes of energy provision to improve functional and physical fitness of athletes in the pre basic training.

To achieve the aim of the study the following **tasks** were set:

1. Analyze library resources on improving the women-rowers' functional and physical fitness by using of different training modes in the pre basic training.
2. Study functional and physical fitness of women rowers aged 14–15 and develop training session programs in rowing considering these features for purposeful stimulation of aerobic and anaerobic energy provision processes.
3. Verify experimentally the effectiveness of the impact of training programs designed for the functional and physical fitness of athletes during annual cycle training session.

Research arrangement. We have studied the effect of various training modes in canoe rowing on the functional state of the organism, the impact on competitive activity and physical fitness of girls. The experiment involved 45 athletes aged 14–15 which having sporting experience of 3–4 years with qualification of II – III sports category. All girls who were engaged in the developed programs were in training groups. The training session programs that included various training modes were developed on the basis of scientific data and results of previous studies of our own. Trainings were held in the preparatory macrocycle period and athletes were divided into 4 groups. The duration of the entire training cycle for each group was 16 weeks. There were 6 classes per week, 3 of which were devoted to training focused on stimulation of aerobic or anaerobic processes (according to program designed for training sessions), and the other 3 workouts were the same for all groups of athletes (according to curriculum) [2]. Developed programs of training sessions were mainly applied by different training regime and energy provision. Workouts were conducted in the area of the optimum range of the loading inner side, which is calculated individually for each athlete. [1] The intensity of the loading during rowing was expressed as a percentage of the absolute value of the maximum oxygen consumption (VO_{2max}). Given intensity of work met a certain heart rate (HR). During the performance a rower had to comply with established heart rate (heart rate monitor was used). The inner side of the loading was determined by power consumption (in calories), which was calculated according to [1, 7] on energy costs at various heart rates. Measuring physical activity off, we proceeded from the fact that the inner side of the work performed must be in the optimal range, which is limited to the minimum and maximum allowed by values of energy costs. According to Ju. M. Furman's method [7]. The maximum size of the inner side of the loading (E_{max}) was determined in calories and the value inner side of the work performed was expressed as a percentage relative to E_{max} (% of E_{max}) Characteristics of the developed training session programs are given in Table. 1.

An examination was carried out in stages: prior to the training cycle and after 8 and 16 weeks from the beginning.

The following methods were applied:

- theoretical analysis and synthesis of the library resources;
- pedagogical monitoring;
- pedagogical experiment;
- pedagogical testing using veloergometry, chronometry, heart rate monitor, electrocardiography;
- methods of mathematical statistics.

Results and discussion. Studies have shown that training in aerobic mode of power provision using a standardized method of continuous exercise contributed plausible improvement of some indices which defined functional preparedness and individual test results that characterize physical fitness. Under the influence of such training women's physical performance indices (PWC_{170} relative to 10.38%, $p < 0.05$) and aerobic performance (VO_{2max} relative to 6.06%, $p < 0.05$) were significantly increased and overall endurance (2.72 %, $p < 0.05$) was improved according to the result of 1500 meters race.

Workouts in mixed mode of power provision using the method of continuous variable exercises contributed to significant increase in functional training: physical performance (PWC_{170} relative) was increased by 17.90% ($p < 0.01$), aerobic capacity (VO_{2max} relative) was improved to 9.64 % ($p < 0.01$), and anaerobic (lactate) performance of the body ($IPPC$ relative) was increased by 6.85% ($p < 0.05$). However, gained results of our study indicate that 16-week workouts according to the program

contributed to the significant increase in speed at the distance of 1000 meters by 5.70 % ($p < 0.01$) and 500 m by 2.68% ($p < 0.05$). At the same time such training helped to increase overall stamina and strength endurance. In particular, the average index of 1500m distance test was improved to 3.70% ($p < 0.05$), and the index of test on bending and unbending of arms in lying position was increased by 16% ($p < 0.05$).

Table 1

Characteristics of training session programs

Work and rest nature	Training session programs			
	I	II	III	IV
Training method	continuous standard exercise	continuous variable exercise	interval variable exercise	interval variable exercise
Workout time	45 min	45 min	60 min	60 min
Workload	9–10 km	9–10 km (sections 600–650 m)	8–9 km (sections 140–150 m and 200–230 m)	9.10 km (sections 480–520 m)
Rowing intensity, HR	60 % VO_{2max} , HR around 153 beats/min–1	at sections – 70 % VO_{2max} , HR around 165 beats/min –1, between the sections – 50 % VO_{2max} , HR around 141 beats/min–1	at sections – 90 % VO_{2max} , HR around 187–189 beats/min –1, between the sections – 25 % VO_{2max} , HR around 110–112 beats/min–1	at intervals – 85 % VO_{2max} , HR around 182–183 beats/min –1, between the sections – 25 % VO_{2max} , HR around 110–112 beats/min–1
Repetitions number	no	5	2 series/6 sections	4 series/2 sections
Duration	no	3 min	1 st series – 30 sec, 2 nd series 60 sec	2.5 min
Work performance	without stopping	on the boat motion	1 st series – “on motion”, 2 nd series “from start”	on the boat motion
Rest nature	no	rate change	active	active
Rest interval	no	6 min	between sections – 3 min, between series – 15 min	between sections – 2.5 min, between series – 10 min
Energy costs during the workout	523.1 kcal (about 82.0 % of E_{max})	501 kcal (about 80.8 % of E_{max})	437.5 kcal (about 67.7% E_{max})	563 kcal (about 85.1% E_{max})

Sixteen-week workouts in mixed mode of power provision using the method of interval variable exercises also improved the functional fitness according to indices of physical capacity, aerobic and anaerobic (lactate) performance of athletes. Thus, the magnitude $PWC_{170 \text{ relative}}$ exceeded the initial level at 14.20% ($p < 0.05$); $VO_{2 \text{ max relative}}$ was improved to 8.49% ($p < 0.05$); IPPC relative was increased by 11.30% ($p < 0.01$). These changes affected rowers' functional preparedness and their results in competitive exercises and some indices of physical fitness. In particular, the results of 1000 m distance race were improved to 1.91% ($p < 0.05$); 500 m to 3.47% ($p < 0.05$) and to the greatest extent such outcomes caused an increase in speed at the distance of 200 m to 4.53 % ($p < 0.01$). It should be noted that training according this mode have contributed significant changes to most of the indices of quality parameters of athletes' motor condition. In particular, the average speed- strength endurance indices were significantly improved to 13.37%, ($p < 0.01$), speed – 3.26% ($p < 0.05$), stamina – 2.89% ($p < 0.05$), explosive power – 2.25% ($p < 0.05$), strength endurance – 17.5% ($p < 0.05$).

Workouts according to mixed mode of power provision using a standardized method of interval exercise compared to other training programs were the most effective, as for the impact on functional and physical fitness. Thus, $PWC_{170 \text{ relative}}$ exceeded the initial level by 18.86% ($p < 0.001$); $VO_{2 \text{ max relative}}$ – by 10.81% ($p < 0.001$); IPPC relative – by 11.90% ($p < 0.01$). Thus, the given program, to a greater extent than other training programs, has improved the results of distance race: 1000 m to

2.68% ($p < 0.01$), 500 m to 4.31% ($p < 0.001$) and 200 m 4.43% ($p < 0.01$) and improved average stamina to 3.84% ($p < 0.01$), speed-strength endurance to 12.41% ($p < 0.01$) and strength endurance by 18.56% ($p < 0.01$).

Conclusions:

1. The study of the problem has made it possible to establish the dependence of the efficiency of improvement of rowers' functional and physical fitness in the pre-basic training regime on the mode of power provision and training method.

2. The developed programs of training sessions in rowing with taking into consideration athletes' physical fitness for purposeful stimulation of aerobic and anaerobic energy processes.

3. Established differences of impact on aerobic and anaerobic workouts focused on the functional and physical fitness, as well as on the results of competitive exercises of women-rowers in the pre basic training that must be considered when planning the training process. Thus, the most effective workouts were those ones of mixed mode of power provision (aerobic- anaerobic and anaerobic-aerobic), as they significantly improve athletes' functional and physical fitness.

4. During the 16 weeks of training in aerobic or anaerobic regime of power provision for muscle work, significant changes in athletes' blood pressure and body weight weren't observed.

Regardless of the training session method, workouts conducted according to designed programs do not cause impairments of the body's functional state.

Prospects for further research. The study of the effectiveness of various modes of training at the pre basic training of women rowers on the physical and functional fitness encourages the creation of new and improved comprehensive training programs, using of which will improve athletic performance.

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**ИСПОЛЬЗОВАНИЕ РАЗЛИЧНЫХ РЕЖИМОВ
ТРЕНИРОВОК В ФИЗИЧЕСКОЙ ПОДГОТОВКЕ
ГРЕБЧИХ НА ЭТАПЕ
ПРЕДВАРИТЕЛЬНОЙ БАЗОВОЙ ПОДГОТОВКИ**

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Аннотация. Статья посвящена изучению влияния физических упражнений, которые целенаправленно стимулируют аэробные и анаэробные процессы мышечной работы, для улучшения функциональной и физической подготовленности девушек-байдарочниц. Цель исследования заключалась в разработке программ тренировочных занятий по гребле на байдарках с различным режимом энергообеспечения, направленных на совершенствование функциональной и физической подготовленности спортсменок на этапе предварительной базовой подготовки. В эксперименте принимали участие 45 девушек 14–15 лет, спортивный стаж которых составлял 3–4 года, квалификация II – III спортивные разряды. Установлено, что работа в смешанном режиме энергообеспечения (аэробно-анаэробном и анаэробно-аэробном) более эффективна, чем в аэробном.

Ключевые слова: гребля на байдарках, физическая и функциональная подготовленность, режим энергообеспечения, этап предварительной базовой подготовки.

**USING OF VARIOUS TRAINING MODES
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DURING THE PRE-BASIC TRAINING**

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Abstract. This article is devoted to studying the influence of exercises focused on stimulating of aerobic and anaerobic muscle work processes to improve functional and physical fitness of women-canoeists. The aim of the study was to develop some training session programs in rowing with various modes of energy provision to improve functional and physical fitness of athletes in the pre basic training. The experiment involved 45 women aged 14–15 years with sporting experience of 3–4 years with qualification of II – III sports category. It was found that work at mixed-mode power provision (aerobic-anaerobic and anaerobic-aerobic) is more effective than at aerobic one.

Key words: rowing, physical and functional training, energy mode, the pre-basic training.

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