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A MODEL FOR TRAINING HIGHLY QUALIFIED KAYAK AND CANOE ROWERS IN A MACROCYCLE

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Abstract. The article examines the fundamentals of planning the training process for highly qualified kayak and canoe rowers within a macrocycle. It presents a description of a model developed by the authors for preparing elite athletes engaged in kayaking and canoeing throughout the training macrocycle. Based on the analysis of scientific and methodological literature, as well as internet sources, and through the generalization of pedagogical experience, the article identifies key factors that highlight the importance of an integrated approach to planning athletic training in rowing sports. These include performance optimization and overcoming performance plateaus, which often occur in sports when progress in physical and technical indicators—and overall athletic results—stagnates despite continued training efforts. The synthesis of this data formed the foundation for developing a model for training highly qualified kayak and canoe athletes within an annual cycle of training and competition. This model takes into account aspects of physical, technical-tactical, and psychological preparation, distributed according to the periods and stages of the training-competitive process.

Key words: rowing, training model, macrocycle, factors, training process.

Introduction. Along with many problems, the issue of mastery in various fields of human activity is on the agenda in modern Kazakhstan, including physical culture and sports. The health of the generation and the prosperity of the nation are primarily related to physical education and, in particular sports. According to the Concept of Physical Culture and Sports Development of the Republic of Kazakhstan for 2023-2029, a new stage in the development of sports activities will involve the management and organization of a continuous training system for national teams and the country's sports reserve, as well as the promotion and involvement of the population in physical education and amateur sports. These transformations will lead to an increase in the qualitative and quantitative level of sports skills for professional athletes, which in turn will ensure the competitiveness of Kazakhstani athletes in the international sports arena [1].

Rowing plays a significant role in the physical education of Kazakhstan's citizens. This sport is actively developing through children's sports schools and other sports organizations. Rowing training sessions have several goals: to provide active recreation, improve health, enhance the general and specialized physical fitness of the population, and incorporate this discipline into the educational process.

An analysis of foreign scientific research in rowing has shown that many authors consider long-term sports training to be a complex open system, encompassing technical, tactical, physical, psychological, and theoretical aspects, as well as paying great attention to the recovery process following extreme training and competitive physical exertion. The leading physical qualities, including exceptional endurance, strength, and speed, influence the planning of physical activity during the preparatory stage of the one-year sports training cycle for highly qualified rowers. Among the numerous methods of planning the training process, the block periodization proposed by V.B. Issurin is considered the most rational, as it allows for the consistent development of necessary physical abilities without adverse effects on one another. At the same time, experts express their opinion on the need to take into account the individual characteristics of athletes, calling it one of the leading factors influencing the construction of the training process [2-9].

The need to introduce pedagogical and methodological innovations into the system of sports training is becoming increasingly obvious. The use of innovative approaches aimed at increasing the effectiveness of sports training is of particular importance. Consequently, methodological renewal and pedagogical support are becoming key components of the effectiveness of sports training. It is the systematic approach and the use of innovative methods that ensure the competitiveness of athletes and prepare them for performances at the largest world-class competitions [10-13].

The introduction of modern techniques in rowing is an important aspect of this field's progress. The latest training methods are of great importance because they can enhance the effectiveness of the training process, improve results in competitive activities, particularly in rowing, and help athletes reach new levels. The existing contradictions between the need to train highly qualified, competitive rowing athletes in Kazakhstan and the lack of an effective one-year sports training model underscore the relevance of our research.

The objective of the study. The analysis of the effective model for one-year training of the Kazakhstan national rowing and canoeing team aimed to rationalize the planning of the macrocycle and its subsequent implementation in the training process.

Research Goals:

1. Analysis of scientific literature on the problem of planning sports training in rowing.

2. Identify the main factors influencing the planning process of sports training for highly qualified rowers.

3. To develop a model of sports training for highly qualified rowers for a one-year period.

Materials and Methods. The following methods were used to solve the tasks set: analysis of scientific and methodological literature, observation, analysis, and generalization of pedagogical experience.

To organize the study, a detailed action plan was created, which included the selection of participants, the definition of inclusion and exclusion criteria, the study duration, methods of data collection, and an analysis plan.

Six highly qualified athletes from the national rowing and canoeing team actively participated in the study. The group included both male and female athletes representing various age categories from 18 to 25 years old.

During the study, various factors affecting the athletic performance of rowers were taken into account. Initially, the titles and regalia of each athlete were taken into account, as they can serve as evidence of experience and achievements in a sports career. Additionally, the physical, psychological and tactical characteristics of each athlete were taken into account.

Results. The integration of modern approaches into the rowing training system is a significant step in the development of this discipline. The use of advanced training methods helps to increase the effectiveness of the training process, improve sports results and increase the competitiveness of athletes. These innovations create conditions for achieving new sporting heights in rowing.

During the analysis of scientific and methodological literature and the study of regulatory documents in rowing, we identified factors that show the importance of changing the approach to planning sports training in rowing:

– Performance optimization: Modern training techniques will help maximize an athlete's innate potential and optimize their performance in the competitive process. Research and development of new approaches to athletes' training enable us to identify effective ways to develop various physical qualities, technical skills, and tactical readiness in rowers.

– Overcoming a plateau: In sports, it is not uncommon for an athlete to reach a plateau and his progress stops. The inclusion of new training methods will help overcome this barrier and continue the athlete's development, providing new incentives for the rower's growth and improvement.

– Improved athletic performance: New training approaches will lead to significant improvements in athletic performance. The development of innovative training programs, taking into account the individual characteristics of athletes and utilizing advanced technologies, will help increase the effectiveness of training and achieve high achievements.

– Injury prevention: new training methods contribute to the prevention of sports injuries among rowers. They take into account the safety aspects of athletes, helping to prevent damage associated with an incorrectly constructed training process.

– Motivation and engagement: the introduction of innovations in the training process helps to increase the motivation and engagement of athletes. Diverse and innovative training techniques create a more stimulating and engaging environment, which helps keep athletes motivated throughout the training process.

Examining the training process of rowers on kayaks and canoes in Kazakhstan over various periods of the annual cycle, we suggest that the creation of a training model and the use of new tools can significantly increase the level of physical, technical, mental, and tactical readiness of athletes. This, in turn, can lead to high results in the international arena. We assume that these changes and new approaches will help rowers from Kazakhstan become competitive and successful athletes in international competitions.

Improving the level of physical fitness, especially in terms of developing general and special endurance, muscle strength and coordination of movements, has a key impact on the athletic achievements of canoeists. Effective performance of technical elements, as well as resistance to stress and prolonged efforts are directly related to the level of development of these physical qualities. However, the importance of psychological preparation should not be underestimated. An internal desire to win, the ability to concentrate under competitive pressure, the ability to manage one's emotions and maintain a stable psycho-emotional state play an equally important role in achieving high results. The complex interaction of physical and mental factors allows an athlete to realize his or her potential to the maximum at key moments of competition. Thus, a holistic approach to the training process, including both physical and psychological components, is the basis for the formation of a competitive athlete capable of performing effectively in the international arena.

When drawing up a sports training plan, the coach must take into account the periodization of the athlete's physical development, as well as the individual characteristics of each athlete, considering their body capabilities and the level of physical ability development that is most prominent in rowing. The leading method

in training highly qualified athletes is the variation of physical activity in all its components, such as the number, pace, amplitude, duration, and intensity, as well as the complication or facilitation of the conditions for performing the training load.

With increasing fitness and enhanced functional capabilities of the body, the training potential of the means used inevitably decreases. Therefore, it is necessary to introduce regularly more intense means into the training process, for example, the intensification and summation of training loads of a certain orientation [7, c. 198].

Based on the data obtained from the analysis of scientific literature and pedagogical observation of the training process of rowers in Kazakhstan, we have developed a model of sports training for a one-year period in three periods: preparatory, competitive, and transitional, by types of sports trainings: technical, tactical, physical and psychological (Figure 1).

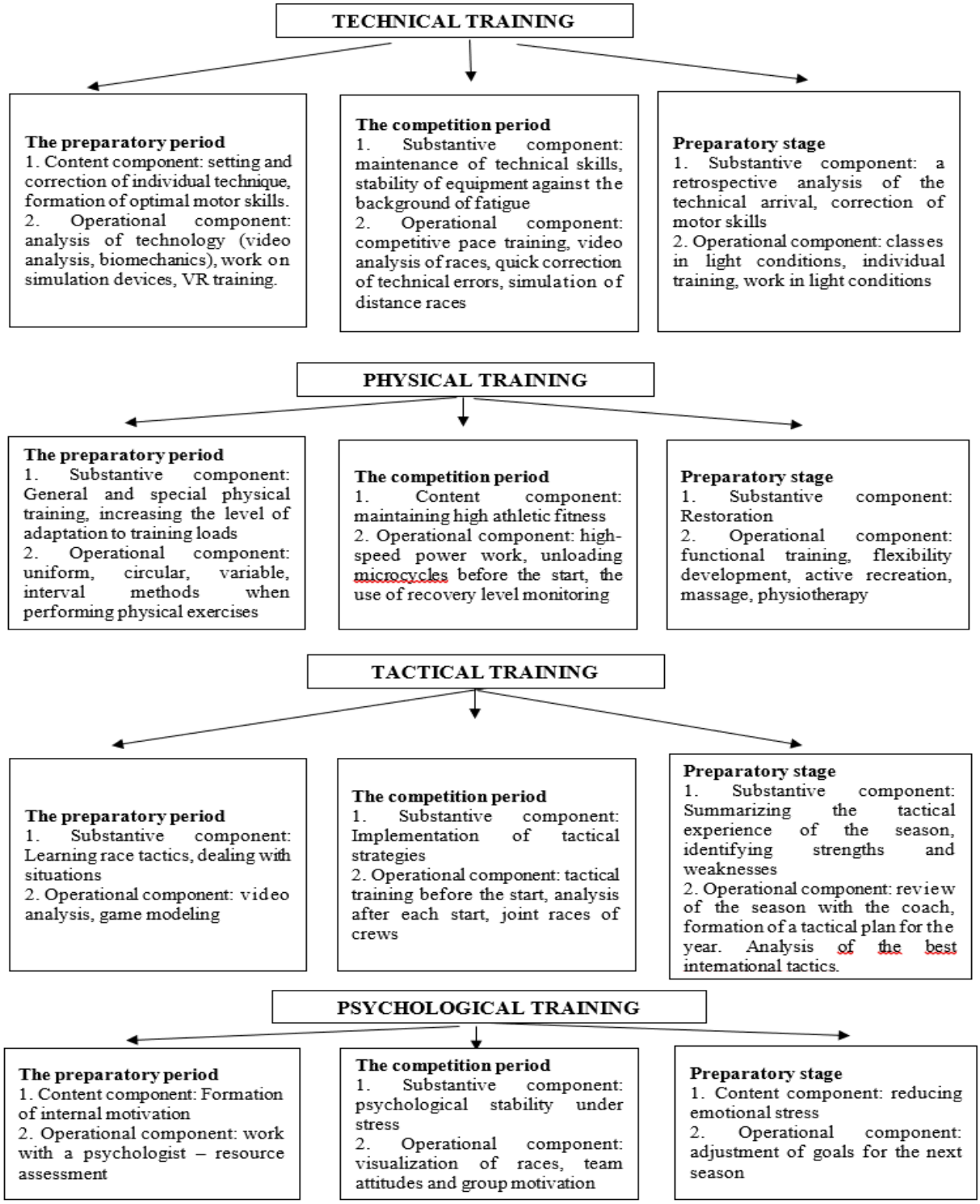

Figure 1 – The model of training highly-qualified rowers in a macrocycle

The advantages of the model we have developed are: individualization of the training process, high feedback, interdisciplinary support, monitoring the effectiveness of the training process, monitoring recovery, participation of athletes in the development of a training plan.

Discussion. Within the framework of the developed model of training highly qualified rowers in an annual cycle, physical training prevails in the autumn-winter period in order to increase maximum strength and hypertrophy of muscle fibers. The following approaches are recommended to ensure monitoring of the dynamics of the results:

1. Regular measurement of training, testing, and competition results;

2. Comparing current results with previous measurements or reference values;

3. The use of specialized tools and technologies, such as GPS sports trackers, heart rate sensors and software that automate the process of measuring and analyzing results.

The monitoring results should be used to evaluate and adjust the training program in accordance with the goals set. This helps the coach and athletes understand how effective the technique is and which aspects need improvement.

The data obtained during the planned control and monitoring points will help identify the strengths and weaknesses of the training program, as well as make appropriate adjustments to the preparatory plan.

In the macrocycle training model developed by us, it is advisable to apply the following methodological approaches to increase the volume and intensity of training loads: gradual increase in volume and intensity, variation of macrocycles during the macrocycle in the direction of the super compensation phase, the use of interval training from high-intensity work of 20 seconds to 2 minutes with rest from 10 seconds to 40 seconds, respectively, individualization according to the speed of recovery of the athletes' body, load planning according to the principle of undulation.

The combination of domestic coaching experience with progressive methods of foreign specialists can play a key role in modernizing the rowers' training system in Kazakhstan. Such a synthesis of approaches opens up prospects for sustainable development of rowing, forming the basis for systemic changes. At the same time, the need for regular monitoring of the implementation of the introduced methods is of particular importance. Constant monitoring, accompanied by analytical understanding of the obtained data, allows for timely adjustment of the training process, taking into account the individual characteristics and specific needs of Kazakhstani athletes. It is this adaptive model that helps to increase the effectiveness of training and achieve stable sports results.

In general, a balanced approach, structured in the model we have developed, based on the analysis of results and flexible adaptation to variable conditions, will allow us to achieve optimal results in training work.

Conclusions. The analysis of scientific and methodological literature has identified the primary qualities of rowers, including exceptional endurance, speed, and strength. The factors that reflect the need for searching for new techniques and introducing modern approaches in the sports training of highly qualified rowers have been identified. These include optimizing performance and overcoming plateaus. In sports, it is not uncommon for an athlete to reach a plateau were improving athletic performance, preventing injuries, maintaining motivation, and enhancing engagement are key. Based on the analysis of scientific and methodological literature and pedagogical observation of the training process of highly qualified rowers of the national team of Kazakhstan, we have developed a model of a one-year cycle of sports training, which suggests the activities of the coach in the process of planning training for technical, tactical, physical and psychological training for the periods of the macrocycle in the context of the content and process components. The effectiveness of this model is due to its comprehensive approach to the training process. The specifics of rowing, as well as the physiological and psychological aspects of training, were taken into account, which in turn will optimize the load, diversify training programs, and ensure the progressive development of rowers.

The results of the study indicate the high efficiency of the developed methodology in training canoeists. The data obtained demonstrate its practical significance and feasibility of introducing it into the training process of the national team. The methodology can serve as a scientifically substantiated tool for improving the level of sports training, allowing coaches to more accurately plan loads and achieve sustainable growth of results. The study contributes to the development of the theory and practice of training in rowing, substantiating the prospects for further use and improvement of the proposed approach. The results obtained confirm the potential of the methodology not only in the context of current sports practice, but also as a basis for future research aimed at adapting and individualizing the training process. Thus, the developed methodology is a relevant direction in the field of sports science and can be used by both practitioners and scientists in order to improve the effectiveness of sports training.

At this stage, we have developed a training model for kayakers and canoes; however, several pressing issues remain that require further study. First, it is important to conduct a more extensive study, which will involve a larger number of athletes. This will enable more reliable and generalized results that can be applied to a wide range of rowers, regardless of their training level or age. A large sample of athletes will also help to identify more accurate patterns and trends regarding the impact of the chosen technique on their athletic achievements.

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References

1 Resolution of the Government of the Republic of Kazakhstan dated March 28, 2023, No. 251. On the approval of the Concept for the Development of Physical Culture and Sports in the Republic of Kazakhstan for 2023–2029. https://adilet.zan.kz/rus/docs/P2300000251 (resource access date 20.05.2025).
2 Omelchenko E.S. Organisational and methodological aspects of experimental training programs for athletes lightweights in academic rowing // Pedagogics, psychology, medical-biological problems of physical training and sports. – 2014. – Vol.4. – pp. 27-33.
3 Kleshnev V. Boat acceleration, temporal structure of the stroke cycle, and effectiveness in rowing // Sports Engineering and Technology. – 2010. - Vol.224. – pp. 63-74. DOI: 10.1243/17543371JSET40.
4 Issurin V.B. Block Periodization of Sports Training. – Moscow: «Sovetsky Sport», 2010. – 281 p.
5 Zamotin T.M., Verlin S.V. Multicycle Planning Structure for the Training of Highly Qualified Rowers // Science and Sport: Current Trends. – 2016. – Vol.12. - №3. – pp. 31–35.
6 Zhong Yu., Weldon A., Casado A., González-Mohíno F., González Ravé J.M., Cao Y., Zheng H., Yin M., Xu K., Li1 Yo. Training-Intensity Distribution, Volume, Periodization, and Performance in Elite Rowers: A Systematic Review // International Journal of Sports Physiology and Performance. – 2025. – Vol.20. – pp. 610-621.
7 Kvashuk P.V., Semayeva G.N., Maslova I.N. Dynamics of Training Load Volumes of Canoe and Kayak Rowers of Different Qualifications in a Long-Term Perspective // Scientific Notes of P.F. Lesgaft University. – 2022. – №2(204). – pp. 196–199.
8 Kolotsei K.K., Ovdienko K.E., Garbar A.A. Fundamentals of Structuring the Training Process in Large Macrocycles in Canoe and Kayak Rowing / 10th International Scientific and Practical Conference «Current Issues of Physical Education, Sports and Tourism»: Proceedings. – Mozyr, 2024. – pp. 139–141.
9 Chertov O.V. Improvement of Training Loads in Canoe and Kayak Rowing Aimed at Developing Maximum Oxygen Consumption / 13th International Scientific and Practical Conference «Physical Culture, Sport, Health and Longevity»: Proceedings. – Taganrog, 2024. – pp. 65–71.
10 Platonov V.N. The System of Training Athletes in Olympic Sports. General Theory and Its Practical Applications: Textbook [for coaches]. — Kyiv: Olympic Literature, 2015. — Vol.1 — 680 p.
11 Zharmenov D.K. Optimization of Pre-Start States of Highly Qualified Kayak and Canoe Rowers: PhD Dissertation: 8D01401 / Kazakhstan Academy of Sport and Tourism. – Almaty, 2020. – 189 p.
12 Ray S. The Canoe Handbook: Techniques for Mastering the Sport of Canoeing. — Mechanicsburg, PA: Stackpole Books, 1992. https://archive.org/details/canoehandbooktec00rays/page/n7/mode/2up.
13 Petrone, N., Isotti A., Guerrini G. Biomechanical Analysis of Olympic Kayak Athletes During Indoor Paddling // International Conference on the Engineering of Sport. - 2006. - №9(2). - pp. 413-418.

МАКРОЦИКЛДЕ БАЙДАРКА МЕН КАНОЭДЕ ЖОҒАРЫ БІЛІКТІ ЕСКЕКШІЛЕРДІ ДАЙЫНДАУ МОДЕЛІ

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Аңдатпа. Мақалада макроциклдегі байдарка мен каноэде жоғары білікті ескекшілердің оқу-жаттығу үдерісін жоспарлау негіздері қарастырылады. Оқу үдерісінің макроциклінде байдарка мен каноэде есумен айналысатын жоғары білікті спортшыларды даярлаудың авторлар әзірлеген моделінің сипаттамасы ұсынылған. Ғылыми-әдістемелік әдебиеттер мен интернет көздерін талдау, педагогикалық тәжірибені жалпылау нәтижесінде ескек есу спортында спорттық дайындықты жоспарлаудың кешенді тәсілінің маңыздылығын көрсететін факторларды анықтау беріледі: өнімділікті оңтайландыру, физикалық, техникалық көрсеткіштердегі және жалпы спорттық нәтижедегі прогресс тоқтаған кезде спортта жиі пайда болатын үстірттерді жеңу, оқу іс-әрекетінің жалғасуына қарамастан. Деректерді талдауды жалпылау жаттығу-жарыс қызметінің кезеңдері мен кезеңдеріне сәйкес бөлінген физикалық, техникалық-тактикалық және психологиялық дайындық аспектілерін ескере отырып, жаттығу-жарыс қызметінің жылдық циклінде байдарка мен каноэде жоғары білікті ескекшілерді даярлау моделін қалыптастыруға негіз болды.

Түйін сөздер: ескек есу, дайындық моделі, макроцикл, факторлар, жаттығу үдерісі.

МОДЕЛЬ ПОДГОТОВКИ ВЫСОКОКВАЛИФИЦИРОВАННЫХ ГРЕБЦОВ НА БАЙДАРКАХ И КАНОЭ В МАКРОЦИКЛЕ

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Аннотация. В статье рассматриваются основы планирования учебно-тренировочного процесса высококвалифицированных гребцов на байдарке и каноэ в макроцикле. Представлено описание разработанной авторами модели подготовки спортсменов высокой квалификации, занимающихся греблей на байдарках и каноэ в макроцикле тренировочного процесса. В результате анализа научно-методической литературы и интернет-источников, обобщения педагогического опыта дается определение факторов, отражающих значимость комплексного подхода к планированию спортивной подготовки в гребном спорте: оптимизация производительности, преодоление плато, которое нередко возникает в спорте, когда прогресс в физических, технических показателях и, в целом, спортивного результата, останавливается, несмотря на продолжение тренировочной деятельности. Обобщение анализа данных послужило основой для формирования модели подготовки высококвалифицированных гребцов на байдарке и каноэ в годичном цикле тренировочно-соревновательной деятельности, с учетом аспектов физической, технико-тактической и психологической подготовки, распределенных в соответствии с периодами и этапами тренировочно-соревновательной деятельности.

Ключевые слова: гребля, модель подготовки, макроцикл, факторы, тренировочный процесс.

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