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Comparative analysis of the effectiveness of different training programs for athletes of high qualification, specializing in rowing

Abstract. ***Purpose:*** *to evaluate the efficiency of different programs of training sessions to improve operational preparedness qualified athletes who specialize in rowing.* ***Materials and Methods:*** *the study included 10 athletes craftsmanship that are part of the national team of Ukraine rowing. To assess the functional training using computer program "SHVSM" and submaximal test PWC170.* ***Results*** *are content authoring program training sessions to improve functional training highly skilled athletes who specialize in rowing and academic results its experimental verification.* ***Conclusions:*** *the experiment confirmed a higher efficiency of the program of training sessions for rowing-sportsmen team Ukraine compared with the program, which is traditionally used, as evidenced by the survey.*

Keywords: *functional preparedness, rowing, Ukraine women's team, the macrocycle, Olympic cycle training program training sessions author.*

Introduction. It is conventional that the level of functional readiness is one of the most important components of the general preparedness of sportsmen specializing in different types of sport including in rowing [1; 4; 5; 8].

Rather large number of researches locates in which the possibility of a practical solution of a matter at the expense of the increase in total amount of physical activities of various orientation, increases of volume of the competitive practice, optimization of the system of recovery actions, increases in volume of special and auxiliary preparation is devoted to a problem of the increase of functional readiness in rowing at various stages of long-term sports preparation [2; 3; 6; 10].

At the same time, according to a number of authors, the most perspective direction in the improvement of functional preparedness of oarsmen and oarswomen in rowing is the development of new programs of training classes on the basis of the last achievements of sports science considering features of dynamics of indicators of functional preparedness of sportsmen within separate micro and mesocycles, and also model characteristics for representatives of this sport [3; 6; 7; 9].

The relevance and the undoubted practical importance of the noted problem became prerequisites for carrying out the real research.

Communication of the research with scientific programs, plans, subjects. The work is a part of scientific programs of the faculty of physical training and the chair of the Olympic and professional sport and is executed within the subject "Studying of adaptive opportunities of an organism of sportsmen at different stages of the educational and training process" (number of the state registration is 0106U000583) the Consolidating plan of the RW of the Ministry of Education and Science of Ukraine for 2010-2014.

The objective of the research: to give an assessment to the efficiency of the use of different programs of training classes for the increase of the level of functional preparedness of sportswomen of high qualification specializing in rowing.

Material and methods of the research. An assessment of the efficiency of different programs of training classes directed on the increase of the level of functional preparedness of sportswomen of high qualification specializing in rowing held on the basis of the comparative analysis of results of tests of representatives of the national team of Ukraine on this sport (n=10). The research was conducted from October, 2010 to June, 2012 within the third (2010-2011) and the fourth (2011-2012) macrocycles of a four-year cycle of the Olympic preparation.

Testing of functional preparedness of sportswomen was held at the beginning of the preparatory (October, 2010 and October, 2011) and the competitive (June, 2011 and June, 2012) periods of the third and fourth macrocycles.

Within the third macrocycle the sportswomen were engaged according to the traditional program for

the sportswomen specializing in the rowing corresponding to a stage of the maximum realization of individual opportunities.

The program of training classes developed by us which main feature was a redistribution of volume of training loads with emphasis on physical activities of an aerobic, an aerobic- anaerobic and a power orientation was used in the fourth macrocycle in the training process of sportswomen of the national team of Ukraine on rowing.

In comparison with the traditional program it was offered to increase rowing volume in an aerobic mode at the all-preparatory stage on 10–11%, at the special and preparatory stage – on 12–14%, at the precompetitive stage – for 7–8% and at the competitive stage on 6–7%.

Changes of volume of the rowing work in the mixed (aerobic and anaerobic) mode made respectively 12-14%, 13–15%, 9–10% and 7–8%, and in the anaerobic mode from 12–15% at the all-preparatory stage to 5–6% at the competitive stage.

Besides, the volume of loadings on high-speed and power preparation was increased by 15–16%, power preparation on 20–22%, and special preparation on ergometer Concept-2 – on 17–19%.

The presented changes were made due to the corresponding decrease in a number of training hours on the general physical preparation of oarswomen of a national team of Ukraine on rowing.

The advanced computer program of an express-assessment "SHSM" was used for an assessment of the level of functional preparedness of sportswomen and its separate components in our research [5]. The following parameters of functional preparedness of sportswomen were defined: absolute ($aPWC_{170}$, $kgm \cdot min^{-1}$) and relative ($rPWC_{170}$, $kgm \cdot min^{-1} \cdot kg^{-1}$) sizes of the general physical working capacity; absolute (aMCO, $l \cdot min^{-1}$) and relative (rMCO, $ml \cdot min^{-1} \cdot kg^{-1}$) sizes of the maximum consumption of oxygen, alakctate (ALACp, $W \cdot kg^{-1}$) and lactate (LACp, $W \cdot kg^{-1}$) power, alakctate (ALACc, s. u. and $mmol \cdot kg^{-1}$) and lactate (LACc, s. u. and $mmol \cdot l^{-1}$) capacity, threshold of an anaerobic exchange (PANO, in % from aMCO), heart rate at the level of PANO (bpm^{-1}), the level of the general (GE, points), speed (SE, points) and speed and power (SPE, points) endurance, reserve opportunities of an organism (RO, points), profitability of the system of power supply of muscular activity (PSP, points) and general level of functional preparedness (LFP, points).

For the purpose of an additional assessment of the efficiency of various programs of training classes we also used the model characteristics of functional preparedness of sportswomen of rowing of the leading teams of Europe and the world (China, the Czech Republic, Italy, and Belarus).

All results received during the research were processed on the personal computer with the use of a package of the program Statistika 6.0.

Results of the research and their discussion. The comparative analysis of the indicators used in the research registered at the oarswomen of the national team of Ukraine at the beginning of the preparatory periods of the third and fourth macrocycles of a four-year cycle of the Olympic preparation allowed to state almost an identical initial level of their functional preparedness (tab. 1).

It is shown that it wasn't noted statistically reliable distinctions in sizes of indicators of functional preparedness of the sportswomen received at their initial testing in the third and fourth macrocycles at the beginning of the research.

In particular, the general level of functional preparedness in both cases was considered as average and made 62,52±0,68 points at the beginning of the third macrocycle and 64,71±0,95 points at the beginning of the fourth macrocycle.

Results of the comparative analysis of the data obtained at the repeated testing of sportswomen of the national team of Ukraine on rowing at the beginning of the competitive periods of the third and fourth macrocycle allowed to establish the following (tab. 2).

At this stage of the experiment the majority of indicators of functional preparedness of the examined sportswomen registered at the beginning of the competitive period of the fourth macrocycle were authentically above the same indicators noted at sportswomen of rowing in the previous year.

So, authentically higher sizes of the general physical working capacity (respectively 27,86±0,38 and 25,44±0,38 $kgm \cdot min^{-1} \cdot kg^{-1}$), aerobic productivity (74,97±0,66 and 71,08±0,38 $ml \cdot min^{-1} \cdot kg^{-1}$), alactate power (10,03±0,15 and 9,65±0,11 W), a threshold of an anerobny exchange (77,40±0,62 and 71,47±0,60%) were characteristic for them, HR at the level of PANO (188,60±1,14 and 181,22±1,17 bpm^{-1}), the general metabolic capacity (227,54±2,90 and 217,79±2,90 s.u.), the general (81,24±1,18 and 65,21±1,02 points) and high-speed

(83,30±1,50 and 77,74±0,86 points) endurance, reserve opportunities (85,91±0,94 and 69,41±2,10 points), profitability of system of power supply (86,12±0,90 and 89,62±1,15 points) and the general level of functional preparedness (86,60±0,74 and 79,08±0,76 points) which was considered as high.

Table 1

Indicators of functional preparedness of sportswomen of the national team of Ukraine on rowing at the beginning of the preparatory periods of third (MC-3) and fourth (MC-4) of macrocycles, X±S

Indicators	MC-3	MC-4
$rPWC_{170}$, kgm·min^{-1}·kg^{-1}	22,30±0,34	22,80±0,21
rMCO, ml·min^{-1}·kg^{-1}	63,71±0,34	64,19±0,28
ALACp, W	8,81±0,10	9,02±0,09
ALACc, s. u.	55,60±0,58	56,85±0,68
ALACc, mmol·kg^{-1}	14,63±0,15	14,96±0,18
LACp, W	6,86±0,14	7,02±0,18
LACc, s. u.	43,35±0,54	44,72±0,76
LACc, mmol·l^{-1}	10,84±0,14	11,18±0,19
PANO, %	63,87±0,54	64,44±0,68
HRpano, bpm^{-1}	169,49±1,12	171,03±1,28
GMC, s.u	194,28±2,58	198,43±2,88
GE, points	47,54±0,90	49,38±0,56
SPE, points	61,41±1,35	64,94±2,23
SE, points	66,59±0,80	68,67±0,67
RO, points	52,38±1,87	55,38±2,08
PSP, points	79,54±1,05	81,36±1,59
LFP, points	62,52±0,68	64,71±0,95

Table 2

Indicators of functional readiness the oarswomen of the national team of Ukraine on rowing at the beginning of the competitive periods of the third and fourth macrocycles, X±S

Indicators	MC-3	MC-4
$rPWC_{170}$, kgm·min^{-1}·kg^{-1}	25,44±0,38	27,86±0,38 **
rMCO, ml·min^{-1}·kg^{-1}	71,08±0,38	74,97±0,66 ***
ALACp, W	9,65±0,11	10,03±0,15 *
ALACc, s. u.	59,9±0,62	60,84±0,77
ALACc, mmol·kg^{-1}	15,76±0,16	16,01±0,20
LACp, W	7,74±0,15	7,79±0,13
LACc, s. u.	49,60±0,62	50,72±0,66
LACc, mmol·l^{-1}	12,40±0,16	12,68±0,17
PANO, %	71,47±0,60	77,40±0,62 ***
HRpano, bpm^{-1}	181,22±1,17	188,60±1,14 *
GMC, s.u	217,79±2,90	227,54±2,90 *
GE, points	65,21±1,02	81,24±1,18 ***
SPE, points	78,57±1,53	81,87±1,62
SE, points	77,74±0,86	83,30±1,50 **
RO, points	69,41±2,10	85,91±0,94 ***
PSP, points	89,62±1,15	86,12±0,90 *
LFP, points	79,08±0,76	86,60±0,74 ***

Note. ** – p<0,005; ** – p<0,01; *** – p<0,001 in comparison with indicators in the third macrocycle.*

The obtained data testified to higher efficiency of the program for the increase of the level of functional preparedness of sportswomen of the national team of Ukraine offered by us on rowing.

Results of the comparative analysis of sizes of relative deviations of indicators of functional preparedness of the examined sportswomen from model characteristics at the beginning of the competitive period of the third and fourth macrocycles (tab. 3) became the convincing confirmation to it.

Table 3

Deviation of indicators of functional preparedness of sportswomen of the national team of Ukraine on rowing at the beginning of the competitive periods of the third and fourth macrocycles, in %

Indicators	MC-3	MC-4
$rPWC_{170}$, kgm·min^{-1}·kg^{-1}	–14,14±1,48	–5,99±2,11**
rMCO, ml·min^{-1}·kg^{-1}	–10,75±1,56	–5,88±2,53
ALACp, W	–11,23±1,24	–7,77±1,98
ALACc, s. u.	–4,4±1,70	–2,9±1,50
ALACc, mmol·kg^{-1}	–4,4±1,70	–2,9±1,50
LACp, W	–6,53±1,49	–5,88±1,23
LACc, s. u.	–5,76±1,57	–3,62±1,33
LACc, mmol·l^{-1}	–5,76±1,57	–3,62±1,33
PANO, %	0,61±1,51	–0,89±1,36
HRpano, bpm^{-1}	–4,48±1,66	–2,41±1,34
GMC, s.u	–12,74±1,51	–8,83±1,42
GE, points	–25,02±1,42	–6,59±2,35***
SPE, points	–10,49±1,46	–6,74±1,23
SE, points	–12,51±1,30	–6,26±2,46*
RO, points	–24,92±1,51	–7,07±1,10***
PSP, points	0,93±1,70	–3,01±1,15
LFP, points	–14,38±1,46	–6,24±1,27***

Note. ** – p<0,005; ** – p<0,01; *** – p<0,001 in comparison with indicators in the third macrocycle.*

It is shown that sizes of deviations of the majority of indicators of functional preparedness the oarswomen of the national team of Ukraine from model characteristics at the beginning of the competitive period of the fourth macrocycle were less, than similar deviations within the third macrocycle.

Distinctions in sizes of deviations from model characteristics in such parameters as the level of the general physical working capacity (–14,14±1,48% in the third macrocycle and –5,99±2,11% in the fourth macrocycle), the general (respectively-25,02±1,42% and –6,59±2,35%) and speed (–12,51±1,30% and –6,26±2,46%) endurance, reserve opportunities of an organism (–24,92±1,51% and –7,07±1,10%) and the general level of functional preparedness (–14,38±1,46% and –6,24±1,27%) were most essential.

In general results of the conducted research allowed note a higher efficiency of the program of training classes for the sportswomen of high qualification specializing in rowing developed by us that gives the grounds to recommend it for the practical use when training sportswomen of rowing.

Conclusions:

1. Results of the conducted research allowed state a higher efficiency of the program of training classes for the sportswomen of high qualification specializing in rowing developed by us in comparison with the traditional program of preparation.

2. In our opinion, the higher level of functional preparedness of sportswomen of the national team of Ukraine on rowing in the fourth macrocycle of a four-year cycle of the Olympic preparation was reached substantially at the expense of the increase in volume of rowing in the aerobic and the aerobic - anaerobic mode, and also the volume of special preparation on a rowing ergometer Concept-2.

Prospects of further researches in this direction. Further the modernization of the author's program of training classes is planned for the sportswomen of the highest qualification specializing in rowing in a year cycle of the preparation directed on the greatest possible achievement of model characteristics.

References:

1. Barykinskiy Z. A., Yudin B. D. Aktualnyye problemy fizicheskoy kultury i sporta [Actual problems of physical culture and sports], Moskva, 2012, p. 16–21. (rus)

2. Vinogradov V. Teoriya i metodika fizichnogo vikhovannya i sportu [Theory and Methodology of Physical Education and Sport], 2006, vol. 4, p. 57–62. (ukr)

3. Dyachenko A. Yu. Nauka v olimpiyskom sporte [Science in the Olympic sport], 2007, vol. 1, p. 54–61. (rus)

4. Mak-Dugal D. D., Govard E. U., Govard D. G. Fiziologicheskoye testirovaniye sportsmenov vysokogo klassa [Physiological testing of high-class athletes], Kyiv, 1998, 431 p. (rus)

5. Malikov M. V., Bogdanovska N. V., Svatev A. V. Funktsionalna diagnostika v fizichnomu vikhovanni ta sporti [Functional diagnosis in physical education and sport], Zaporizhzhya, 2006, 199 p. (ukr)

6. Mikhaylova T. V. Grebnoy sport [Rowing], Moscow, 2006, 400 p. (rus)

7. Miftakhutdinova D. A., Malikov M. V., Svatyev A. V. Kompleksna programa pidgotovki zhinochoi zbirnoi Ukraini z akademichnogo vesluvannya do Olimpiyskikh Igor-2012 v Londoni [A comprehensive training program for women's national rowing Ukraine to the Olympic Games 2012 in London], Zaporizhzhya, 73 p. (ukr)

8. Platonov V. N. Sistema podgotovki sportsmenov v olimpiyskom sporte [System Preparation athletes in Olympic disputes], Kyiv, 2004, 808 p. (rus)

9. Slautina I. N. Faktornaya struktura podgotovlennosti sportsmenok razlichnoy spetsializatsii kak osnova postroyeniya trenirovochnogo protsessa v akademicheskoy greble : Dis. ... kand. ped. nauk [Factor structure of preparedness of athletes of various specializations as the basis for constructing the training process in rowing :PhD thesis], Moskow, 2006, 164 p. (rus)

10. Yudin B. D., Zelenin M. A. Aktualnyye problemy fizicheskoy kultury i sporta. Sbornik nauchno-metodicheskikh trudov professorsko-propodavatelskogo kollektiva, aspirantov, soiskateley i studentov [Actual problems of physical culture and sports. Collection of scientific-methodical works of professors and propodavatelskogo staff, graduate students, job seekers and students], Moskva, 2010, 186 p. (rus)

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