



DOI:10.28925/2664-2069.2021.11

UDK: 796.015.421

## DEVELOPMENT OF FOCUSED RECOVERY AND STIMULATION MEANS IN PRE-COMPETITIVE PRACTICE AMONG HIGHLY QUALIFIED ATHLETES IN RACE WALKING

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### Author contribution:

A – study concept and design; B – data collection; C – data analysis and interpretation; D – paper writing; E – paper editing; F – paper final adoption

### Abstract

*Introduction.* Today such modern technologies of integral sports training in race walking are developed which will take into account all the demands of nowadays high performance sports including means of recovery and stimulation of functionality. It is known that many aspects of the trainers' professional experience remain uninvestigated. *Hypothesis of the research:* to find out the existence of opportunities to improve the quality of trainers' work with highly qualified athletes in pre-competitive training in race walking.

The *aim of the research:* to specify problem issues in pre-competitive training, to substantiate the prospective of development and focused use of specific means for recovery and stimulation of functionality in pre-competitive practice among highly qualified athletes in race walking.

*Material and methods of the research:* the questionnaire among 12 trainers (n = 12) specializing in training athletes in race walking was conducted: 3 honored coaches of Ukraine, 3 highest category coaches, and 6 first category ones. The method of interviewing the responders (questionnaire) via ordinal assessment scale was used.

*Results:* the positive attitude among responders towards today's means for recovery and improving functionality in pre-competitive training, preventive care of trauma, and solving issues in improving the race walking technique was highlighted. The methods of non-parametric assessment of data distribution function given in the table were used.

*Conclusions:* the prospective for using the results of the research for efficiency of the trainers' collaboration in working with highly qualified athletes under conditions of intensifying modern training process was presented.

**Key words:** race walking, pre-competitive training, trainers, questionnaire.



**Introduction.** Race walking is a complicated technical and sports reflection of brisk walking being considered as a type of endurance [1]. Sometimes the ideas occur that in cyclic sports a total number of technical methods and tactical actions is limited. This does not always correspond the reality as the rules of competitions in race walking stand for such limitation [2].

It is worth noting that the complexity of locomotions in walking has cross manner caused by biomechanical reasons. Cross coordination in walking plays an important role in developing kinematics and dynamics of stepping moves as multidirection of rotating upper and lower sections of the system towards the vertical axis of an athlete's body leads to their reactive interaction and gives an opportunity to increase the leg span and speed as well as passing pelvis moves. As take-off is a crucial mechanism of locomotion, in the system the swinging element should also work efficiently whose lack makes full completing of this action impossible.

Coordination of moves in race walking is complicated as an example of dynamic balance when stability of operating position is achieved by virtue of move [3].

To boost functionality among athletes in training and competitive activities in race walking specialists are developing today's technologies of integral sports training taking into account the whole complex of demands to nowadays high performance sports including means for recovery and stimulation of functionality.

The information received from

qualified trainers working with national teams of Ukraine is of importance. In this kind of athletics there are known achievements among the Ukrainian athletes whose trainers took part in the questionnaire: year 2014 – victories in individual and team competitions at the World Championship (China); year 2015 – the victory in team competitions of the Universiade (Korea) and team silver at the World Cup (Italy); year 2017 – the victories in team and individual competitions at the European Cup, men, 20 km (Czech Republic); year 2018 – team bronze at the World Cup, women (China); year 2019 – the victories at the European Cup of both men's and women's teams of Ukraine in 50 kilometers race walking. At the same time, a lot of aspects of the trainers' professional experience, unfortunately, remain uninvestigated.

The analysis of data taken from research and methodological literature in the course of training in race walking during pre-competitive period was determined by dominant concepts of nowadays' specialists in theory and practice of Olympic sports on the degree of importance and divergence of means for recovery and stimulation of functionality during this period.

Thus, in the works of A. Bondarchuk [4], the attention is given to using means for recovery and stimulation of functionality during the competitive period. The author supposes that the achieved level of competition form can be preserved in the course of competitive period only in case of changing means of training with heavy workload – running upwards or on sand, increasing the amount and intensity or applying new



methods of developing endurance. If there is a need to reduce the time for getting in competition form, the complexes of used exercises are not changed. In this way the adaptation processes are supported by virtue of which the athletes get in the state of competition form. But if there is a need to increase the time for getting in competition form, the change of means of the used exercise complexes is applied after certain periods of time. The more often the change of training means occurs, the longer is the process of the athlete's getting in the state of competition form [4].

The works by T. Bompa and C. Buzzichelli [5] approve that athletes can use specific methods for achieving neuromuscular limit before the competitions or on the day of competitions. This limit is the essence of all methods of potentiations of neuromuscular system. As the authors divide endurance into three types – short-term, medium term and long-term muscular ones according to physiological characteristics of endurance sports – the necessity of strength conversion into muscular endurance is indicated. Besides, training muscular and strength endurance should occur simultaneously. This demand can be followed via training two qualities on separate days or via combining them in one training session. In this case, the authors' position on training muscular endurance (which should be completed at the end of training session as working on specific endurance often includes technical training) can be of interest for us.

Fatigue can stand for limitation of combined trainings, and if there is a

need in reducing overall daily workload, usually the amount of workload in muscular endurance is reduced. Actually, as high muscle tone (as well as getting peak condition) is related to central nervous system, an athlete's performance can be boosted due to completing short and intensive exercises the day before the competition, in the morning of a competitive day or even exactly before the competition depending on the used methods and parameters of the training [5, 6, 7].

Our investigations confirm these positions. The developing and using of special exercises for efficient preservation of technical parameters of the athletes' moves in race walking when fatigue comes are covered in them. The program of suggested actions is used during pre-competitive training period [2].

V. Issurin [8] suggests modeling of competitive behavior and boosting technical and tactical skills as an obligatory component of realization mesocycle program in many sports. Due to the athletes' mood before the prospective competitive behavior, the pre-competitive microcycle can be shorter or longer than a week. It is usually aimed at providing psychological, physical as well as technical and tactical training for upcoming competitions and accomplishing the athletes' recovery after the previous workloads.

V. Platonov [9] recommends using specially oriented training and extra-training means of recovery manner during special training stage of pre-season and the ones of mobilization manner during competitive period when the means of integral manner



prevail. In this way, using special pre-competitive impacts creates preconditions for boosting the efficiency of competitive activities in a number of sports.

According to V. Platonov's and other authors' recommendations [9, 10], it is worth noting that in the course of training for competitions in race walking there are some peculiarities determining the opportunities to use special means for recovery and stimulation of functionality among athletes. Planning to use such means should be as thorough as physical workloads during these periods.

Due to the mentioned above, the **aim of the research** is determined as: to specify problem issues in pre-competitive training, to substantiate the prospective of development and focused use of specific means for recovery and stimulation of functionality in pre-competitive practice among highly qualified athletes in race walking.

**Material and methods of the research.** The questionnaire among 12 trainers specializing in training athletes in 20 and 50 km race walking who work with prominent athletes of Ukraine where there were: 3 honored coaches of Ukraine, 3 highest category coaches, and 6 first category ones. The following principles of bioethics were used: informed consent, autonomy of an individual, free will and voluntary choice, and the right to make autonomous decisions.

The researches were conducted by the authority of Ukrainian Athletic Association (UAA) in reliance on ethical rules; the responders were anonymous in the researches and in the text of the paper (UAA decision № 03-

276 from 03.20.2020).

The expert evaluation method within the research required interviewing the ideas of prominent trainers of Ukraine in race walking (n=12) about the process of pre-competitive activities in race walking, the means for recovery and stimulation of functionality, the preventive care of the most fragile musculoskeletal system elements' trauma among athletes.

In the course of the research, the empiric methods of interviewing the responders via questionnaire and synthesis of the results method were used, the assessment of the trainers' attitude towards the investigated problem was conducted using Likert-type scale [11]. A classic scale was used containing the following marks: 5 points – totally agree; 4 points – agree; 3 points – partially agree; 2 points – partially disagree; 1 point – totally disagree. Each answer option was given the rank from 5 to 1 where the answer option «totally agree» corresponded to the rank 5, and the answer option «totally disagree» corresponded to the rank 1. The unavailability of zero limits the data analysis only with continuous division aimed to check the hypothesis and it was defined that other scales in a manner 0,1,2,3 were steadier and can represent a more logical option [12]. Using the given method gives an opportunity to receive qualitative assessment of the responders' attitudes suitable for the analysis of expressed interest in the studied aspect evaluated via rank scale.

Actually, an order evaluation scale is used for expressing the responders' consent or dissent from the given



statements characterizing the object of the research based on which the analysis is built. For Likert's 5 elements the t-test with MWW (Mann-Whitney-Wilcoxon) data usually has the same capacity [13].

The method of interviewing the responders via Likert-type scale (questionnaire) was used as well as the methods of non-parametric assessment of data division function given in the table 1.

**Results of the research and discussion.** Familiarizing with the

work experience among the trainers of Ukraine in athletic race walking as well as the analysis of means used for recovery and stimulation of functionality during pre-competitive training of highly qualified athletes in race walking approved that during the athletes' training process a considerable attention is given to the means aimed to recover the functional state of the athletes' bodies in the course of training process.

*Table 1*

**Evaluation of the trainers' (n=12) attitude to the problem of pre-competitive training**

Questions in the survey for trainers	Number of points received for the question	% to overall number of points	Average number of points	Likert-type scale's evaluation
Question 1. How do you think, is it worth affecting the process of recovery after training workloads in race walking via special means?	60	11.7	5.0	totally agree
Question 2. Do you consider recovery procedures a part of training process in race walking?	60	11.7	5.0	totally agree
Question 3. Do you use the means for recovery and stimulation of functionality in race walking in your practice?	56	11.0	4.7	totally agree
Question 4. Are there the conditions for using the recovery means where you conduct the training sessions in race walking?	31	6.1	2.6	partially agree
Question 5. Do you consider recovery procedures a preventive care from musculoskeletal system trauma among the athletes doing race walking?	59	11.5	4.9	totally agree
Question 6. Do you use special exercises for preventive care from ankle joint and plantaris muscles' injuries among the athletes doing race walking?	45	8.8	3.8	agree
Question 7. How do you think, is it worth developing the sense of motion parameters and ground reaction among athletes to improve the technique of race walking?	60	11.7	5.0	totally agree
Question 8. Do you use special exercises to preserve technical capabilities among athletes in race walking when fatigue comes?	58	11.4	4.8	totally agree
Question 9. Do you use medical and biological means stimulating functionality among athletes during pre-competitive training period?	39	7.6	3.2	partially agree
Question 10. Do you use the means for recovery and stimulation of functionality during pre-start training?	43	8.4	3.6	agree
<b>Total</b>	<b>511</b>	<b>100</b>		

*Note:* median (1; 3 quartiles).



As a result of analysis and synthesis of the responders' answers concept statements determining the role and place of means for recovery and stimulation of functionality as a system element of competitive activity were defined.

Most trainers consider recovery procedures a preventive care from musculoskeletal system trauma among the athletes doing race walking and use special exercises to strengthen the athletes' capsular ligamentous apparatus.

The trainers know that using special exercises to increase analytical sense of key motion parameters can affect the efficiency of race walking technique when fatigue comes [6, 14].

Large focus is given to developing an athlete's sense of motion parameters and ground reaction to improve the technique in race walking as well as to using special exercises to preserve the athletes' technical capabilities in race walking when fatigue comes.

The results of the analysis of questionnaire survey approved national specialists' positive attitude to using special means for recovery after training workloads (question 1).

How important the trainers' ideas on recovery means as a part of training process in the athletes' training are is covered in the answers to the questions two and three.

In the course of the analysis of the answers to the fourth question it was clarified that during pre-competitive training the means for recovery and stimulation of functionality are used by national trainers less than it is required by nowadays' practice in high performance sport. The lack of corresponding conditions can stand for

the reason for it.

The answers to the fifth and sixth questions approved that sometimes the responders exaggerate the effect of recovery procedures as the means for preventive care from trauma a bit underestimating the use of special exercises for preventive care from ankle joint and plantaris muscles' injuries at the same time which are sensitive elements of musculoskeletal system among athletes specializing in race walking although it is quite important since traumas and illnesses as well as their impact on availability of trainings in the course of training are the main factors determining the possibility of an athlete's gaining success or failing at the international level [15, 16].

By the results of the experts' questionnaire, it is possible to state that in the course of training national trainers pay considerable attention to improving technical skills among athletes and developing special senses of spatiotemporal technical motion parameters, which almost does not differ from the foreign specialists' opinions [17].

Particular attention is given to using special exercises to preserve the athletes' technical capabilities in race walking when fatigue comes which is covered in positive answers to the questions 7 and 8. These aspects in pre-competitive training are completed by foreign specialists [18]. Unfortunately, medical and biological means stimulating the athletes' functionality during pre-competitive and pre-start training periods are not always available for national trainers (questions 9, 10).

Insufficient awareness in efficiency of such means (methodology



of potentiation) known by us as extra-training ones [19] require engaging kinesiotherapy specialists to provide practical assistance for trainers and athletes during pre-competitive and pre-start training periods.

Eventually, the responders' positive attitude to nowadays' means for recovery and boosting of functionality, preventive care from trauma, and solving issues of improving race walking technique was covered. The prospective for using the results of the research for efficient collaboration of trainers and highly qualified athletes under the conditions of intensification in today's training for competitions and its high integration is represented.

Therefore, the analysis of research and methodological literature gave an opportunity to clarify the specificity of the trainers' answers to the given questions on the means for recovery and stimulation of functionality among athletes in the course of training in race walking during pre-competitive period.

The responders' answers indicated the problem, which the lack of awareness is related to and, as a result, the lack of practical skills of using the means for recovery and stimulation of functionality in the course of competitive activity.

It is possible to state that regardless of an overall positive idea on the need of systemic use of such means, there is no scientifically substantiated methodology of their practical use in an integral way.

The main problem consists in the lack of understanding the differentiation of means aimed at stimulation of functionality in the course of pre-start training, means for correcting the fatigue and for

stimulating recovery processes.

The basis for understanding the problem and determining the ways for solving it as a result of developing the way of systemic approach under natural conditions of sports training is systematization of methodological frameworks of sports training periodization. It is based on using patterns of developing urgent and long-term adaptation reactions in the course of specially organized competitive activity.

It is worth noting that in the course of training for the competitions in race walking there are certain peculiarities, as, for example, the stages of early and qualifying competitions. The terms of the stage of the main and qualifying competitions can be shifted depending on fulfilling the conditions of qualification to the team World Championship or Continental Cup (European) being held usually three-five weeks earlier than the Summer Championship of Ukraine.

It is necessary to take into account that the duration of active rest after performing on 20 km distance can account for two weeks, and on 50 km – three weeks. After that, the basic mesocycle with considerable training workloads (3-4 weeks) is planned. Then pre-competitive mesocycle (three weeks) is planned in the course of which the amount of training work sharply lowers, and the training has an individual nature [10]. On this stage, for efficient solving of pre-competitive training issues in race walking the need in the Athletics Federation' assistance in organizing medical and biological control as well as the corresponding specialists' advanced training to work with the main national team of Ukraine



in race walking arises.

#### **Prospects for further research.**

The given results of the research form the ground for continuing the studies in the direction of increasing specialized focus of the means for recovery and stimulation of functionality among athletes specializing in race walking. They are related to developing and searching for the ways of practical implementation of pre-competitive impacts in accordance with their influence on boosting specific effects of training and competitive workloads.

It is known that in race walking an athlete can need emotional support from the trainer during pre-competitive and pre-start activities as well as in the course of the competitions. This is what the difference from team sports consists in where an athlete can get assistance, support and even technical instructions from their partners [20].

It is shown that an athlete's reaction to the trainer in stress is usually negative. The athletes' opinion that trainers are less efficient when stressed was reflected in perception of competence and relationships trainer – athlete but these topics can become a push for further researches [21].

#### **Conclusions:**

1. The analysis of today's researches approved that using special pre-competitive impacts creates preconditions for boosting the efficiency of competitive activities in many sports, notably, in athletic sports.

2. The results of expert interviewing demonstrated that trainers in race walking have positive attitudes to using means for recovery and stimulation of functionality in the course of pre-competitive training but use them less than demands today's sporting practice since there are no corresponding conditions.

3. At the present stage, the trainer in race walking is usually a single-skilled specialist capable to provide technical, tactical, physical, and other types of training at a sufficiently high level. But sometimes they need assistance from special experts to provide quality pre-competitive training of athletes.

4. Successful performance of national teams on the Olympic arenas considerably depends on success of representatives in athletics. Success is possible with the athletes specializing in race walking as they can have a positive impact on overall result of the national team of the state. The synthesis of the trainers' work experience as well as studying their activity can be interpreted as one of the sources of completing the requirements of high performance sports.

The researches were conducted by the authority of Ukrainian Athletic Association (UAA) in reliance on ethical rules; the responders were anonymous in the researches and in the text of the paper (UAA decision № 03-276 from 03.20.2020).

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*The author claims no conflict of interests.*

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*The article received: January 18, 2021*

Vynohradova O. Development of focused recovery and stimulation means in pre-competitive practice among highly qualified athletes in race walking. *Sports Science and Human Health.* 2021; 1(5):4-13. DOI:10.28925/2664-2069.2021.11