MODELING OF A TECHNICAL READINESS IMPROVEMENT AMONG SPRINTERS

A.N. Katenkov –post-graduate
Ulyanovsk State Pedagogical University named after I.N. Ulyanov
Ulyanovsk

e-mail: elena_funina@mail.ru

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Annotation. A sprinter’s technical readiness is the most difficult task, as the speed of physical actions is formed under the influence of many factors and conditions and can’t be conditioned only by indices increase of the studied motional-coordinating quality. Running demands high level of speed qualities, which provide maximum for the achieved level of training result. This determines the necessity to search for an individual technique of running for each sportsman in running kinds of athletics.

Research methods: scientific-methodical literature analysis and summarizing, a pedagogical experiment, testing, statistical data manipulation.

Materials. The article presents the created by the author model of the technical readiness improvement among sprinters, which gives an integral approach to the training lesson organization, providing the succession of sports training problems solution. The factors, conditions and pedagogical conditions are revealed, the use of which provides the influence on psychological, emotional and volitional spheres, creating the preconditions for the sportsman’s many-sided development (who is ready to achieve a prospective aim).

Results. The speed increase of movements in sprint demands fundamental understanding of a physiological mechanism of speed qualities development, the knowledge of the running steps structural components, which form the running technique: an optimal combination of the running steps frequency and length, the speed and power of the push-off from the support, movements coordination of the upper and lower extremities the realization of which provides speed indices increase and the competitive activity effectiveness.

Conclusion. The received results of the pedagogical experiment showed, that the modeling of sprinters’ technical readiness improvement proves the difficulty of the given process and provides complex consideration of the main components of sprinters’ sports training.

Urgency. Running is a locomotion, which doesn’t demand special training. However, sports running demands high level of speed qualities, which provide maximum for the achieved level of the training result. This determines the necessity to search for an individual technique of running for each sportsman in running kinds of athletics.

Track-and- field running is characterized by a great variety of distances, which demand special qualities, however, the most difficult is the technique of sprint [1, 2, 4, 7, 8]. A high level of sprinter’s technical readiness provides a considerable decrease of energy inputs and quicker rehabilitation of an organism, which conditions the necessity to search for the ways of the individual running technique development.

The aim of the research work is theoretical and methodological substantiation of new approaches creation to the importance of the effectiveness increase of sprinters’ competitive activity.

Objectives:
1. To reveal the peculiarities of sprint.
2. To create the model of sprinters’ technical readiness improvement at the initial stage of sports training.
3. To check the effectiveness of the given model use during the pedagogical experiment.

Sprint technique is the most difficult as the movements quickness is formed under the influence of a great number of factors and conditions and presents the function of the whole organism. One of the peculiarities of sprint tactics (as V.D. Kryazhev (2002); A.I. Pyanzin, E.V. Solodenov (2008) consider) is the necessity to perceive neatly and evaluate reasonably opponents’ actions and to regulate effectively muscular efforts. Sprint effectiveness is mainly conditioned by the state of a musculoskeletal system. Foot muscles should have high indices of power, which are necessary for the quick and powerful push off from the support. Contractile forces of the muscles alternate with further relaxation and owing to these qualities the speed of running increase.

The main factor of speed qualities realization is an optimal correlation provision of the rate and length of the running steps. Sprinter’s muscles are adapted to the work in anaerobic conditions. It is important to take into consideration the fact that the intensity of adenosine triphosphate (ATP) renewal is very important for speed preservation till the end of the distance. In sprint aerobic processes are also very important. In case of no aerobic opportunities the time of organism rehabilitation after a load increases and the level of ability to form an oxygen credit decreases [6, 7]. As N.V. Zimkin (1975) underlines, sprint provides the increase of aerobic opportunities.

Sprinters usually have not deep and accelerated breathing. At 100 meters distance a sportsman fulfills from 14 to 19 breathing cycle with an average depth of inhale 420 ml. It proves that speed qualities demonstration is the function of the whole organism and demands many-sided physical readiness; rational training process organization should be based on the use of the system approach which provides effectiveness increase of a technical readiness.

Materials. Created by us model (picture 1) helps to provide a complex consideration of the main components of sprinters’ sports training. The base of the system approach is the system analysis use, which includes the range of methodological techniques and means for choice and theoretical substantiation of the effective ways of the running speed increase problem solution.

The method of the system analysis is used for different connected aspects of the system consideration:
- the specific content of structural components, which form this system;
- the peculiarities of an inner organization of the system and the ways of its components interaction;
- the functions fulfilled by the system;
- the possible prospects of a system development.

The aim realization, as an important structural component of sprinters’ technical readiness improvement model, is presented as the difficult and long-term process, connected with the organism reconstruction. All this demands a purposeful motional activity, which provides indices increase of the muscular power, quickness, endurance, dexterity, mobility and other motional-coordinating qualities [1, 2, 4, 9].

A special role is given to the formation of the individual motional rhythm as an important component of the running speed.

The increase of the physical readiness goes together with the increase of the vegetative functions: cardiovascular, respiratory and others, which provide motional activity. Consequently, the effectiveness increase of sprinters’ competitive activity is achieved by means of objectives realization complex.
One of the main objectives, providing the realization of sports training stated aim, is conditions creation for a many-sided development of the organism, as the speed qualities increase demands the definite level of muscular power formation, steadiness, individual motional rhythm, orientation in space and time. Sprinters’ sports results improvement demands complex approach, which includes: different objectives organization, places change of the training lessons organization; the use of different kinds supports from a soft one, elastic to a firm, which provides a gradual strengthening of small muscular groups of a foot; the improvement of its amortization qualities. Special running exercises fulfillment in different conditions (in a cross-country, off a mountain, climbing a mountain, being tired) improves spare capacities of an organism, forms the base of strength, helps to orient better in spatio-temporal and spatio-power parameters of motional actions.
The principles of sports training play a great role in the model of sprinters’ technical readiness. The leading role among them belongs to the unity of a general and special physical training. This principle underlines the importance of a general physical readiness as the base for a rational technique of the running steps mastering.

The principle of continuity and cyclicity of the training process conditions the necessity of the constant purposeful influence of the training load, which provides reorganization of the organism for successful functioning in the new active motional activity conditions. This principle is especially important not only because an organism needs a lot of time for high sports results achievement, but it also helps to stay at an achieved training level after the end of the sports career. The achieved results decrease in duration exceeds the period of a sportsmanship increase.

The principles of gradual and maximum increase of the training load are realized in the increase of an organism training level, as the result of a volume and intensity increase of a muscular work, directed at a set goal realization. Without the muscular load increase it is impossible to improve motional-coordinating qualities and to reorganize vegetative functions.

Definite factors influence sprinters’ technical readiness increase, among which the leading role belongs to the optimal correlation of the length and rate of the running steps. The rate of the running steps is the main component of the running speed. As an individual parameter of the running steps, rate has different characteristics, the demonstration of which depends on the level of sports activity management. One more important factor is taking into consideration phenotypic and genotypic characteristics of sportsmanship formation and development on the basis of:
- parameters study of age-related changes of an organism functional and morphological systems under the influence of the training load;
- criteria creation for sports results provision of kinesiological systems development character objective appraisal;
- the means and methods use of a many-sided development and a maximum reserves realization for a competitive activity effectiveness improvement. One of the main factors, defining speed qualities of the sprinter, is the quickness of the push-off from the support.

Research works held by V.D. Kryazhev (2002) showed the direct dependence of the competitive activity result on the speed of the push-off from the support. This demands the choice of special techniques, means and methods of training directed at the skills formation of the rational interaction of the sportsman and the support. A rational use of the parts of a body in space and time decreases resistance of an oncoming air flow; defines an optimal value of articular corners, which is important for speed increase. Moreover, the conditions are created for movements co-ordination of the upper and lower extremities – the next factor, which influences the speed of movements. In case swing movements of arms coincide with the phase of the push-off from the support, increases the effectiveness of the push-off by means of more active acceleration of movements. The speed of running is also conditioned by the individual motional rhythm, which provides the alternation of the muscular tension and relaxation, of the supporting and unsupported phases, and it is important for movements effectiveness provision. In case of the running steps vivid individual rhythm rehabilitation processes are quicker; the sportsman’s working capacity preserves, which underlines the great importance of this factor.

Among the conditions, which increase the effectiveness of running, an important role belongs to the correctly organized warm-up, which is the training lesson vital component. A warm-up conditions the most important physiological changes in an organism:
- increases the heat production;
- improves blood circulation, optimizes blood pressure;
- provides the increase of pulmonary and bronchial blood stream;
- increases the activity of metabolic processes, increases the pulmonary ventilation and others.

Less time for the warm-up decreases the effectiveness of the training process.

One of the conditions for speed of running increase is the improvement of a psycho-emotional state, which normalizes physiological processes, providing the ease of locomotion
increase; understanding of the used techniques, means and methods effectiveness of sports training. The situation of successfulness creation increases the confidence in own abilities, inspires to fulfill motional tasks in case of an objective appraisal of their correspondence to the set model.

Moral-volitional qualities formation is an important component of the training process, as the speed increase is connected with the repeated fulfillment of the running exercises and it demands persistence, an ability to reproduce spatio-temporal and spatio-power parameters of the motional actions being tired [8].

A creative atmosphere formation at the training lessons provides preconditions for the sportsman’s intellectual potential realization, the sportsman who is able to discuss difficult problems of sportsmanship improvement with the trainer, the problems of readiness formation to the special literature study, a positive experience of the outstanding sportsmen.

An important component of the sprinters’ technical readiness improvement model is the use of pedagogical effects. A motional activity stimulation by means of the running steps ideal technique, the use of the adopted standards, the examples of high sports results achievement by the sprinters with the lower level of motional potential provides runners’ motional activity; additional reserves realization of sportsmanship improvement.

A positive evaluation of the sportsman’s activity at every training lesson, an objective estimation of his achievements and mistakes (pointing out the ways of their correction), perspective aims and objectives setting influence greatly the readiness to achieve high sports results. A special role among different pedagogical effects belongs to the pedagogical control of the running steps correspondence to the set parameters. Running is the natural locomotion and in case of mastering the rational technique the sportsman gradually returns to the formed earlier skills of running, not realizing the digression from a rational technique. A regular pedagogical control realized by the trainer helps to reveal timely the moment of the sprinter’s switch from the technically correct running to the comfortable one for him.

Thus, the model of sprinters’ technical readiness improvement has rather difficult structural content and helps to solve the complex of set objectives.

Results and their discussion. In order to check the effectiveness of the offered methodology the pedagogical experiment was held. 28 female athletes of mass categories took part in the experiment (14-16 years old). The CG and the EG were organized, each group included 14 people. Before the pedagogical experiment a test was held in order to reveal the initial level of physical and special running readiness. As the control exercises the following exercises were used: 30 meters running from a high start (seconds); 1000 meters running from a high start (minutes); standing long-jump (centimeters); shot put (3 kilograms) with the right and the left hand; pull-up from a hang position (quantity). The results of the research work didn’t reveal considerable differences according to the level of physical readiness of the female sprinters from the CG and the EG (р>0,05).

The level of a special running training is determined according to the results of running at the following distances: 100, 200 and 400 meters. A comparative analysis of the preliminary results also didn’t reveal considerable differences according to the level of the special running training of the female athletes from the CG and the EG (р>0,05). The training lessons in the CG were held according to the traditional methodology, recommended by the Federation of athletics program of sports training. In the EG created by us model of sprinters’ technical readiness improvement was used.

After the pedagogical experiment one more test was held on physical and special running readiness revelation among the female athletes from the CG and the EG. The received results showed, that there was an improvement in both groups, but in the EG the indices increase was more considerable. In the CG in 30 meters running from the high start with the initial data 5,53±0,19 seconds, to the end of the pedagogical experiment the increase was 1,89% (р>0,05). In the EG with the initial indices 5,52±0,18 seconds, the results improved to 6,4% (р>0,05). In the CG in 1000 meters running from a high start with the initial data 4,72,8±0,24 minutes, to the end of the pedagogical experiment the results improved to 0,87% (р>0,05); in the EG with the initial results
4.7,0,7±0,35 minutes, the increase was 5,14% (p>0,05); in the CG in standing long-jump with the initial indices 1,96±0,17 meters, to the end of the experiment, the results increased to 3,56% (p>0,05); in the EG with the initial data 1,97±0,11 meters the increase was 9,89% (p<0,05).

The analysis of the special running readiness helped to reveal the following results: in the CG in 100 meters running from the low start with the initial indices 14,62±0,13 seconds, to the end of the pedagogical experiment the results increased to 2,36% (p>0,05); in the EG with the initial data 14,67±0,14 seconds, the increase was 7,72% (p>0,05); in the EG with the initial data 1,96±0,17 meters, to the end of the experiment, the results increased to 3,56% (p>0,05); in the CG in standing long-jump with the initial indices 1,97±0,11 meters the increase was 9,89% (p<0,05).

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Conclusion. Thus, the received results of the pedagogical experiment showed the expediency of created by us model, in which an integral process of sprinters’ initial training is organized at the stage of an initial sports training. The base of the model is the system approach, which helps to create the rational algorithm of special exercises use, providing speed increase of sprinters.

A great role in the model is given to the factors, pedagogical conditions and pedagogical effects realization, which provide a set aim achievement and problems solution of the sports training.

References