



Management of the training process in cross-country orienteering on the basis of typical model characteristics of competitive activity and special preparation of the necessary norms

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Abstract

Objective of the study was to experimental justification of the methodical management of the training process of young orienteering athletes based on the use of typical model characteristics of competitive activity and special preparation of proper norms.

Methods and structure of the study. Scientific and methodical literature, reports and planning documents were analyzed in the scientific work. Also, a survey was conducted, in which qualified sportsmen (MS-CMS), specializing in cross-country orienteering, and coaches of various categories took part.

Results and conclusions. Developed and theoretically justified model characteristics for athletes 13-18 years old, specializing in running orienteering. The implementation of the obtained model characteristics in the activities of sports schools allowed to significantly increase the effectiveness of the formation of technical and tactical mastery of orienteering athletes at various stages of the long-term training process.

Keywords: *management of the training process, cross-country types of sports orientation, components of special preparation, model characteristics.*

Introduction. Currently, the priority directions of the state policy of the Russian Federation in the field of physical culture and sports include the preparation of sports reserves [4, 5].

Since the long-term training process in running orienteering has its own specific patterns, in contrast to the “model of the strongest athletes,” the dominant factor in the intermediate models of young orienteers is the level of their special physical fitness and technical and tactical skill. Then comes the competitive activity model (CA), which reflects the features of spatial navigation in cross-country orienteering [1, 2, 8].

In accordance with modern concepts, the generalized basic model is divided into parts, which are arranged in order of importance at three levels. The leading place in the model is given to competitive activity, which mainly reflects the characteristic indicators of technical and tactical skill in a particular sport.

Then comes the model of the athlete’s special preparedness and the model of capabilities [6, 7].

In orienteering, the previously developed theoretical and methodological foundations of training need to be improved, including through innovative approaches to the management system of long-term training. Based on this, it should be noted that in various types of orienteering, the issues of using stage model characteristics of special preparedness are practically not covered, and there are no modern theoretical approaches to their substantiation. The solution to this problem determined the relevance of our research.

Objective of the study was to experimental substantiation of the methodology for managing the training process of young orienteering athletes based on the use of standard model characteristics of competitive activity and proper standards of special preparedness.



Methods and structure of the study. The study was carried out in three stages. At the first stage, scientific and methodological literature, reporting and planning documents were analyzed. A survey was also conducted (n=207), in which qualified athletes (masters of sports, candidates for master of sports), specializing in cross-country orienteering, and coaches of various categories (n=102) took part. The questionnaire contained questions related to assessing the level of influence of special preparedness factors on the effectiveness of competitive activity. At the second stage of the study, the features of competitive activity in running orienteering were studied based on the use of cartography methods, cartometry and visual descriptive analysis of competitive routes. During the testing process, the level of special preparedness of qualified (masters of sports, candidates for master of sports) orienteering athletes (n=140) aged 20-25 years was determined. At the third stage of the study, quantitative model characteristics were calculated for orienteering athletes of various ages.

Results of the study and discussion. Effective modeling is possible only from the standpoint of a systems approach, which, when applied to modeling problems, involves the use of the main components of control theory [3, 7].

Analysis of scientific and methodological literature and advanced practical experience shows that the development of model characteristics is primarily based on data on the influence of individual components of special preparedness on sports results. For this purpose, at the first stage of the study, we conducted a survey and identified the importance of various components of the special preparedness of orienteering athletes. Each of the experts had to answer the question about which of the factors (a total of 36 indicators were proposed for assessment) most influence the result in running orienteering (Table 1).

It has been established that the factors that most influence the effectiveness of competitive activity in cross-country orienteering are the technique of dynamic detailed reading of a sports map, special endurance and the level of mental stability. It should be noted that the opinions of trainers on the importance of special endurance are most uniform (V = 10,5%), and assessments of other leading indicators are more variable (V = 23,3-81,5%) for the reason that they are mainly based on self-assessment of competitive activity, and not on scientific research data.

It is well known that an essential part of the model of the strongest athlete is indicators of physical and intellectual preparedness. Based on this, when developing

Table 1. Information model of an athlete specializing in cross-country orienteering

Factors	Masters of Sports (n=94)			Candidates for Master of Sports (n=113)			Coaches (n=102)		
	M	σ	V, %	M	σ	V, %	M	σ	V, %
Card reading technique	3,2	1,8	56,2	4,1	2,3	56,0	3,4	2,5	73,5
Special Stamina	3,8	3,1	81,5	3,2	2,2	66,7	1,9	0,2	10,5
Mental Stability	3,1	1,4	45,1	5,1	2,3	45,0	7,7	1,8	23,3
Running technique	4,8	2,5	52,0	4,3	2,1	48,8	7,3	2,2	30,1
General Stamina	3,5	1,9	54,2	4,2	2,6	61,9	9,1	4,1	45,0
Operational thinking	5,0	1,9	37,2	5,8	2,5	43,1	5,1	2,2	43,1
Choosing a route between checkpoints	5,1	2,7	52,9	7,1	2,1	29,5	6,9	1,8	26,0
Switching attention	7,0	1,6	22,8	7,1	3,5	49,2	9,3	0,6	6,4
Sustainability of attention	7,1	3,1	43,6	5,8	1,9	32,7	9,0	1,9	21,1
Distribution of attention	8,0	1,7	21,2	6,4	2,3	35,9	9,2	0,7	7,6
Technique of movement in precise azimuth	6,8	2,8	41,1	6,5	2,9	44,6	9,6	0,3	3,1
Speed abilities	8,5	0,8	9,4	5,7	3,3	57,8	10,8	0,8	7,4
RAM	6,3	4,1	65,0	7,6	2,3	30,2	10,0	1,7	17,0
Visual-figurative memory	5,2	2,9	55,7	6,1	2,5	40,9	7,9	2,3	29,1
Speed-strength abilities	10,6	1,7	16,1	9,1	3,9	43,1	9,2	2,0	22,2
Coordination	11,5	1,1	10,3	9,8	2,7	27,8	11,4	0,3	2,9
Strength abilities	12,0	0,8	6,6	9,4	3,0	32,6	12,4	0,3	2,7



Table 2. Model indicators of special preparedness of qualified athletes specializing in running orienteering

Control exercises	Men (n=140)		Women (n=86)	
	MS	I category	MS	I category
Running 5000/3000 m, min, s	15:30	18:00	11:05	13:10
200 m uphill run, s	31.50	33.30	35.00	39.85
200 m downhill run, s	25.00	27.30	26.30	29.50
Cross 5000 m, min, s	17:00	21:00	18:30	23:30
Running 30 m on the move, s	3.48	3.81	3.66	4.21
5x standing long jump, cm	1290	1220	1080	1020
Complex strength exercise, number of times	52	50	45	40
Visual-figurative memory, points	14	11	14	11
Visual-figurative thinking, points	10	8	10	8
Operational thinking, points	9	6	8	5
Distribution of attention, s	76	82	73	80
Switching attention, points	58	51	64	60
Attention span, points	33	27	36	27
Sustainability of attention, with	104	126	100	106
Motor coordination, points	260	240	260	240

age model characteristics, at the second stage of the study, we studied the level of development of these indicators in highly qualified athletes aged 20-25 years, specializing in cross-country orienteering (Table 2).

Over the course of a number of years, indicators characterizing the patterns of competitive activity at the World, European and Russian Championships have also been studied and analyzed. For each of the studied indicators, representative samples of 30-35 people were obtained. Based on the characteristics of competitive activity in running orienteering, the most significant criteria influencing the achievement of high

sports results have been identified. These model characteristics include: running speed at the level of the anaerobic threshold (5,4-5,2 m/s); distance extension coefficient (1,2-1,3); number of technical stops along the distance (2-3 per 1 km); duration of technical stop (3-4 s); marking speed at the checkpoint (2-3 s); accuracy of movement in azimuth (error 5-7%).

We used the criterion of basic values to calculate the proper standards. With this approach, the results of the preparedness of orienteers at the MS level are compared with the base value and expressed in relative values. Since in orienteering the time to cover a dis-

Table 3. Comparative data on the physical fitness of athletes of various qualifications specializing in running orienteering

Control exercises	Masters of Sports			Children's and Youth Sports School graduates (I sports category)		
	Result	m/s	CR	Result	m/s	CR
Cross 5 km, min, s (basic value)	17:22	4.79	1,000	21:11	3.93	1,000
Uphill run 200 m, s	31.78	6.29	1,313	37.19	5.40	1,374
Downhill run 200 m, s	25.30	7.90	1,649	29.51	6.77	1,722
Running 30 m on the move, s	3.52	8.52	1,778	3.91	7.67	1,951
5000 m run, min, s	16:09	5.15	1,075	20:09	4.13	1,050



Table 4. Model characteristics of physical fitness of athletes aged 17-18 years, specializing in running orienteering

Control exercises	Indicators	
	Boys	Girls
Cross 5000 m, min, s	20:00-20:30	23:30-24:00
Uphill run 200 m, s	35.90-37.33	39.44-41.64
Downhill run 200 m, s	28.61-29.75	29.96-33.76
Running 30 m on the move, s	3.78-4.12	4.43-4.65
Run 5/3 km, min, s	19:33-18:50	13:39-13:30
5x standing long jump, cm	1252-1464	1000-1200
Complex strength exercise, number of times	51-59	35-36

tance reflects the success of competitive activity only at a single start (i.e. there is no target indicator), the result of the test that has the highest connection ($r = 0,896$) with competitive activity was taken as a basis - this is the result of cross-country 5000 m race (Table 3).

The next step is to determine quantitative model characteristics. The calculation of the model standard for each exercise is carried out separately. In this case, the base value is multiplied by the coefficient of correlation (CR) and the model value is determined. The described approach was used to develop model characteristics of orienteers of various ages, for example, for athletes 17-18 years old (Table 4).

Thus, the method of mathematical modeling made it possible to determine the development trend of the leading parameters of the special preparedness of young orienteering athletes and to substantiate the main approaches to increasing the effectiveness of the training process.

Conclusions. In the practical application of model characteristics in the control system, the most productive approach is when, after a certain period of preparation, the degree of compliance of the orienteer with the class of leaders is determined. At each stage of long-term training, in accordance with the results of stage-by-stage control, it is analyzed whether the characteristics of sportsmanship belong to a certain range of values, if they fall into which the orienteer can become a leader. If they do not belong, then the athlete's chances of showing good results in the future are small.

The construction of the «leader-outsider» algorithm allows us to move from normative model charac-

teristics of special preparedness to identifying qualitatively new relationships between the training process and sports results. In this regard, the system of comprehensive pedagogical control in running orienteering must strictly comply with the model characteristics both in content and testing methods.

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