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Sequence and duration of physical qualities development in cyclic kinds of sport with endurance demonstration

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Abstract: The article is about the problem of taking into account the sequence and duration of physical qualities development in cyclic kinds of sport with endurance demonstration. This problem was urgent for the specialists as the base for an effective training time distribution in terms of general and special physical training of athletes. Sometimes the planned means of subordinate physical qualities development is realized in terms of training athletes and racing skiers as additional physical loads without orientation determination. **Materials.** We organized expert estimation of specialists' opinions concerning the sequence and duration of the main physical qualities development and support in training average distance runners and racing skiers. **Research methods.** Information sources analysis, method of expert estimation, methods of mathematical statistics. **Results.** By the example of cyclic kinds of sport we defined the sequence, duration of physical qualities development and improvement taking into account the opinions of the specialists. We defined the amount of time, given for physical qualities development, by the example of a weekly micro cycle. We also defined the necessary and effective time for physical qualities development among the average distance runners and racing skiers. The specialists think that the effectiveness of muscle activity energy supply sources formation and development depends on the conditions and time of the means realization, directed toward physical qualities development. We underline the necessity to pay attention to three and more physical qualities development at each lesson. It should be noted that most time among the average distance runners and racing skiers is paid to general endurance and special endurance development – approximately five months, speed-power oriented training-2,5 months, quickness, coordination and flexibility development- 1,5 months. The important component of the training process in athletes and racing skiers is the sequence of physical qualities development and their support during the whole sports training period. **Conclusion.** It was defined that the duration and sequence of the main physical qualities development in cyclic kinds of sport has the same character. Both among the average distance runner and racing skier the main place in the training process takes general and special endurance development. Such physical qualities, as quickness, flexibility, coordination, strength, speed-power qualities are also important, as they are the base of an effective rational athletes' technique demonstration. There are two variants of the training lessons organization: complex orientation and a gradual physical qualities development in all kinds of training. The example of a gradual solution of physical qualities development problem is the following: speed work (25-30%); power work (30-35%); endurance development (35-40%).

Keywords: physical qualities, runners, racing skiers, stages of training.

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INTRODUCTION

The main question of athletes' training improvement in cyclic kinds of sport is the effectiveness of control improvement. For this purpose it is necessary to plan the main physical qualities development and improvement taking into account their realization sequence and duration.

Scientific-methodical sources analysis

showed that physical training takes the first place, especially with the orientation toward the main physical qualities development [1,2,6,10].

The authors consider functional training in terms of athletes physical training as the base for physical qualities development depending on individual ones. [1,3,4,5,7,9].

In recent years great attention is paid to

the functional side of sports training in the kinds of sport as the base for reserve and adaptive capacities of an organism development [1,2,5, 6,10].

In the works of the authors the questions, connected with studying the sequence and duration of time, directed toward physical qualities development, separately and in general in cyclic kinds of sport, are not discussed enough and it makes hard to control the training process.

In the theory and practice of sports training in cyclic kinds of sport the duration of stages and periods of training are mainly considered (divided into micro cycles, meso cycles and macro cycles). In the works of the authors we find the duration of the training cycles, stages, their approximate orientation [1,3,6,9]. Other authors also consider the sequence and duration of the training cycles concerning the kinds of training development [1,3, 11-14].

In this article we define the sequence, duration of the main physical qualities development and improvement, by the example of cyclic kinds of sport, among the athletes in the micro cycle of the special-preparatory stage training during 6 month macro cycle of training, taking into account the opinions of competent respondents.

MATERIALS AND METHODS

We used mathematical methods of the research for qualitative indices calculation. We analyzed the experts' opinions concerning the sequence and duration of the main physical qualities development and support during athletes training. We held a questionnaire survey among the specialists in cyclic kinds of sport (23 people – athletics coaches and racing skiing coaches).

RESULTS AND DISCUSSION

We held a questionnaire survey among the specialists and asked about the duration and sequence of the main physical qualities development among athletes in average distance running and racing skiers during the first 6-month cycle of training.

The results of the questionnaire survey, concerning the time, spent for the main physical qualities development among the average distance runners and racing skiers, by the example of two micro cycles of general-preparatory and special-preparatory stages of the first yearly cycle of training, are presented in table 1.

Table 1 – Results of the questionnaire survey among the specialists concerning the questions of time, spent for the main physical qualities development among the average distance runners and racing skiers

Physical qualities of an athlete	Timespentforqualitiesdevelopment, min(by the example of two-weeks micro cycle of training)				
	According to the plan	Necessary plan	Effective time	Average value	Total value
Average distance runners					
1.Strength and power qualities	4,4/5,0	12,6/15,0	8,0/10,0	8,3 /10	25/30
2.Flexibility	3,4/5,0	5,8/6,0	6,0/10,0	5,1/7,0	15,2/21,0
3.Quickness	2,0/4,0	5,0/8,0	7,0/8,0	4,7/6,7	14/20
4.Coordination	5,6/3,5	8,0/8,0	6,0/8,0	6,5/6,5	19,6/19,5
5.General endurance	10/8,0	10,0/15,0	20,0/15,0	13,3/12,6	40/38
6.Special endurance	6,0/10,0	6,0/10,0	12,0/15,0	8/11,7	24/35
Racing skiers					
1.Coordination	5,0/6,0	8,0/8,0	8,0/8,0	7/8	21/22
2.Speed-power oriented	6,0/8,0	8,0/10,0	10,0/12,0	8/10	24/30
3.Strength	8,0/10,0	10,0/12,0	12,0/13,0	10/11,6	30/35
4.Speed	6,0/6,0	8,0/8,0	10,0/10,0	8/8	24/24
5.General endurance	10/13,0	10/15	15/15,0	11,6/14,3	35/43
6.Special endurance	8,0/10,0	12,0/15,0	15,0/15,0	11,6/13,3	35/40

Table 1 presents physical qualities, which in the opinion of the specialists, should be paid attention to in the training process of the average distance runners and racing skiers.

Table 1 shows that an effective time for physical qualities development, planned and necessary one, differ. Total time according to physical qualities differs greatly from the time according to the plan, within a weekly micro cycle. Thus, the specialists meant trainings of the runners and racing skiers twice a week. It was mentioned that it was one of the episodes of time planning for physical qualities development. The received average values can be used as optimal amount of an effective time for physical qualities development in a weekly micro cycle. The specialists saw real problem of physical training. The difference of duration according to the plan, directed toward physical qualities development, and the necessary time shows that this direction should be considered by the specialists and athletes. It is necessary to control how athletes realize the training means of each lesson.

The specialists consider that each physical quality should be paid attention to even in terms of one lesson. It conditions the effectiveness of the energy supply formation and development sources in muscle activity of athletes. Among the average distance runners general and special endurance are the leading physical qualities. More time is given for their development according to the plan and it corresponds with the opinion of the specialists. Information sources say that the time, which is necessary for the main physical qualities development, exceeds the time devoted to other qualities development. According to the questionnaire survey we revealed the effective time duration for physical qualities development. We define the necessity to pay attention to three or more qualities development at each lesson. The specialists underline mainly the complex character of the training lessons planning as the base for the several objectives solution.

It is necessary to mention, that the examined specialists placed general and special endurance after other physical qualities considering their importance. Such kind of the approach they

explained by the fact that other qualities are the base for the main athletes' physical qualities formation and development.

In the opinion of the specialists, the duration of physical qualities development at all stages of training is an important component of effective sports training. It should be noted that most time both among the runners and racing skiers is paid to general and special endurance – almost 5 months, speed-power oriented training- 2,5 months, quickness and flexibility development- from 1,5 months.

An important component of the training among athletes and skiers is the sequence of physical qualities development and improvement and their support during the whole period of training in a macro cycle.

One more important thing is to support all physical qualities development. For this purpose it is necessary to plan the used means in the macro cycle of training. For the average distance runners and racing skiers it is important to plan the means, directed toward general and special endurance development. These qualities develop gradually within the whole cycle with some transient stage during 2,2 weeks.

Picture 1 presents the diagram of the means volume change, directed toward general and special endurance development and speed-power oriented training, in the average values for cyclic kinds of sport.

Together with general and special endurance development other physical qualities, necessary for the athletes, are developed, improved and supported. Speed-power oriented training in our example is realized together with special endurance development and support. The qualities such as quickness, coordination and flexibility are included depending on the content of the training lesson as an addition. The change of the training means orientation was mentioned at special-preparatory stage.

Fig. 1. The diagram of the means volume change, directed toward main and physical qualities development and their duration in the cyclic kinds of sport

Technical training improvement among the average distance runners and racing skiers lasts till the 10th week, then during the whole cycle the technique develops while physical qualities development. The achieved level of physical qualities preservation is realized approximately since the 15th week and till the end of the early competitive stage. High level of physical qualities development among the average distance runners and racing skiers is demonstrated at the level of their technical readiness.

The approximate periods of start and finish of physical qualities development in the macro cycle of training among the average distance runners and racing skiers coincide. We underline that general endurance development, its support and special endurance development among athletes are realized during the whole yearly cycle. The same situation is among racing skiers. In the opinion of the specialists in athletics and cross country ski race, power oriented training should last forever and gradually transfer into speed-power oriented training. It is important to create the variants of the training means combination in complex lessons.

CONCLUSION

An important component of sports training in cyclic kinds of sport is physical qualities development. They are necessary for the average distance runners and racing skiers. It was defined that the duration and sequence of the main physical qualities development in cyclic kinds of sport has equal character. Both among the average distance runner and racing skiers the main place in the training process takes general and special endurance development. Such physical qualities, as quickness, flexibility, coordination, strength, speed-power qualities are also important. They are the base of an effective rational athletes' technique demonstration. There are two variants of the training lessons organization: complex orientation and a gradual physical qualities development in all kinds of training. The example of physical qualities development problem gradual solution is the following: speed work (25-30%); power work (30-35%); endurance development (35-40%).

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