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Foreign Research Works Concerning Training Process Organization in Sport

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***Abstract*—The article considers the main directions of scientific research works concerning different aspects of the training process organization, revealed during foreign scientific literature analysis within the following period: 2015-2019. We studied the separate peculiarities of orientation and presented research results by the example of volleyball and tennis. It was revealed that the experiments are mainly directed at key physical qualities development optimization. For games it is first of all jumping training. Special attention is paid to traumatism prevention. We mentioned the peculiarities, which can be used for scientific research works optimization among Russian scientists in the sphere of sports science.**

Keywords—training process; research works; analysis; volleyball; tennis

I. INTRODUCTION

A rational training process is the main factor in athletes' fitness development. That is why the research works dedicated to different aspects of the training process organization, form the main volume of scientific works in the sphere of sports science. According to published by us earlier results [1, 2], their part for the cyclic kinds of sport is 9-26%, for games - 11-32% of all available materials.

In many countries the training process organization according to the system of periodization is considered innovative one, and the research works concerning this topic still continue. Unfortunately, during recent years foreign authors ignore the fact, that the basis of periodization theory were created by Soviet scientist. In the book by Bomp T. and Butstsichelli K. [3] there are no references to the works by L.P. Matveev and Yu.V. Verkhoshanskiy. At the same time, described there examples of the training process organization are fully copied from early works of these authors.

The mentioned facts underline the urgency of modern tendencies study in the sphere of scientific organization of training.

The aim of this research work is to demonstrate the main orientation of works concerning sports training substantiation by the example of several kinds of sport.

II. RESEARCH METHODOLOGY

We analyzed scientific literature (mainly periodicals) using Google Scholar base. The period of searching: 2015-2019.

III. RESULTS

We revealed the main directions of research works, dedicated to physical qualities development, which are specific to the following kinds of sport.

Volleyball

Key influence on volleyball players' mastery has jumping readiness. That is why spring ability development is one of priority training objectives in volleyball.

The research work [4] is dedicated to experimental substantiation of training methodology of young 16-19 year-old volleyball players according to periodization system. The regime of trainings was the following: 4 or 5 days a week, 2 training lessons a day (physical and technical-tactical training). The duration of the experiment – 9 weeks, two meso cycles: preparatory (5 weeks) and competitive (4 weeks). The average duration of the training lesson in a preparatory meso cycle among 16 and 19 year-old volleyball players is 63,8 ± 13,0 min and 75,7 ± 22.2 min; in competitive meso cycle - 55.0 ± 11.6 min and 53.4 ± 10.9 min. The prevailing types of the training loads in a preparatory meso cycle were considerably different: main development of strength oriented

qualities development among 19 year-old athletes and general physical training among 16 year-old athletes. In competitive meso cycle complex training lessons prevailed in both groups. It was revealed that the load was greater in preparatory period, than in competitive period. We revealed considerable high jumping results improvement from squat and a stand in both groups, which proves the effectiveness of the offered methodology of training.

A rational transfer period organization was considered in the research work [5], concerning the influence of beach volleyball on jumping readiness and special endurance of athletes, who specialize in classical volleyball. 11 athletes took part in the research work (age range 26,5 ± 3,3 years, training experience 13.2 ± 3.3 years). The duration of the experiment is 12 weeks. The athletes trained according to general training plan: 4-6 training lessons a week, duration- 1.5 – 2 hours. The respondents have valid increase of the following parameters: extensor muscles of a hip and flexor muscles of feet endurance, the power of flexor muscles of feet and power of legs. The achieved adaptations can be positively transferred to a firm cover.

The effectiveness of block use of physical training means was proved in work [6]. 12 female volleyball players from top division of Bosnia and Herzegovina Championship took part in the experiment. The experimental methodology of a short-term complex pre-season training included the combination of special volleyball exercises with physical training means. As a result of the experiment the following things were revealed: general amount of body fluid increase, general and non-fat body mass and body mass index increase and also fat volume in an organism decrease.

The presented research works prove that regardless of orientation (general physical training, special strength oriented training, supporting game load) and the system of the training process organization in volleyball (periodization, block system or relatively even physical training means distribution during the yearly cycle) one of the main features of its rational organization is players' jumping readiness increase. Volleyball development is accompanied by the amount of jumps increase in each match. The jump fulfillment demands explosive efforts and precise organization of movements system. In this connection the authors of the mentioned works defined two main groups of means of jumping results improvement among volleyball players: the influence on the cycle of muscles stretching and contraction and the means of balance development and coordination of movements improvement.

The most popular means of influence on the cycle of muscles stretching and contractions is plyometric exercises use. As a rule, they are used in a form of the block , which lasts 8-12 weeks, 2-3 lessons a week, duration 50-60 minutes. The example of plyometric exercises complex for lower extremities is presented in work [7]. It includes the following: jump from one foot to the other, high jumps standing, jumps pulling knees to the chest, side jumps/ diagonally, long jumps, jump over obstacles, over jumps (on the stairs, on the stand with legs change) and springs down. Highly-intensive exercises were included into the training process since the 6^{th} till the 8^{th} week of training; since the 9^{th} till the 12^{th} week they were used regularly and some players fulfilled jumps with outer poundage 5 % from the athlete's body weight. The degree of jumping results improvement after plyometric loads among the trained volleyball players was nearly 5 – 10 %, among young athletes - till 20 %.

However, in spite of the acknowledged effectiveness of plyometric exercises, some authors underline their extreme injury risk level. It caused the interest of research workers in alternative way of jumping results improvement – balance and movements coordination development among the athletes.

In mentioned above work [5] there was statistically valid jumping readiness improvement among volleyball players after the training on sand. These changes the research authors explain by balance and coordination development of players' movements and don't connect with the cycle of stretching and muscles contraction development.

The tendency of jumping results improvement among volleyball players was revealed after the block of vibrating loads fulfillment [8]. 14 professional volleyball players took part in the experiment, which lasted 8 weeks. There were 3 vibration orientation training lessons a week, which lasted 50 minutes. The load was regulated by the frequency of vibration, amount of attempts and the content of movements. During the 1-2 weeks of the experiment three attempts of exercises fulfillment were used, during the 3-6 week 4 attempts were used. The frequency of vibration during the 1-2 weeks of the experiment was 8 Hz, during the 3-6 weeks - 26 Hz. The work didn't reveal statistically valid increase of jump height, but there was distinct test results improvement. The authors thought that the exercises of this group not only provide jumping readiness improvement, but also present scientifically substantiated means of traumas prevention. Polish scientists studied the methodologies of steadiness training for volleyball players [9]. Experimentally substantiated were the complexes of exercises with loops, which were fulfilled 2 times a week during 2 months, exercises with balancing platform and fitball use, which were fulfilled every day during 10 days and also compression trousers. Among 47% of respondents of this research work steadiness in playing situation considerably increased.

In work [10] the influence of stretching on jumping characteristics of female volleyball players is studied. It is revealed that stretching not only increases the power of muscles, but also provides traumatism prevention. On the basis of the presented sources analysis we can come to the conclusion that jumping readiness increase accompanies rationally organized training process in volleyball. The most effective means of volleyball players' jumping training intensification is plyometric exercises use. At the same time, stabilization training and stretching provide jumping results improvement and are necessary for athletes' traumatism prevention.

Tennis

Hungarian specialists [11] analyzed the influence of the training method, which included repeated sprint runs and a complex of power training (sprint, jumps and strength oriented exercises), which were held 2 times a week during the

competitive period in the group of elite juniors. In the experiment, which lasted 8 weeks, participated 8 World class highly-qualified athletes. After the experiment all variables of sports training considerably increased (p = 0,05, effect from 0,56 till 1,12), apart from repeated sprint test and maximum aerobic productivity test. Training programs, which consist of the repeated sprint runs and a complex of power training, are effective for working capacity increase of highly-qualified tennis players' nervous-muscular system.

The research work held in Great Britain [12] was directed toward the training program creation, realization and estimation. This program trained for transfer from junior to senior age in sport. The program was for the resources, knowledge and readiness development in order to cope with the transfer period. The training lessons of 5 tennis players were captured on video, with demands and strategy of training discussion. Video was used for the work during 11 weeks with 7 young tennis players. For the effectiveness estimation mixed method of projection with one subject was used. The results of the experiment showed that athletes had the following parameters increase: knowledge level, the ability to cope with the situation, confidence and skills, which are connected with the regime of trainings change. The effectiveness of training for transfer into senior category in sport was proved using such program.

IV. DISCUSSION

The presented in the research results of foreign author's works analysis show that in the methodology of training athletes the main stress is maid on specific characteristics, which increase the effectiveness most of all. In this group of kinds jumping training has a key influence on effectiveness and that is why scientists pay great attention to such methods as plyometric training and strength oriented exercises. Moreover, scientists are interested in the methodologies, which provide traumatism level decrease, such as stretching. We underline the fragmentarity of the research works, concentration on narrow oriented study of general problem. At the same time, the considered questions are discussed using a wide range of testing methodologies, which is not often met in the works of Russian scientists.

V. CONCLUSION

The experience of the progressive specialists in sports science of those countries, which are the acknowledged leaders in the studied kinds of sport, and those, where these kinds of sport are intensively developed, can be used for scientific-research work optimization among native scientific collectives.

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