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CONTENT

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DEVELOPMENT OF TEST SYSTEM TO CONTROL THE PLAYERS' PERFORMANCE LEVEL IN TEAM SPORTS GAMES

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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. Current tendencies of team sports games' development and changes on direction and age limits of the stages of long-term training show the need to improve the test system to control the athletes' performance in these sports taking into account the tasks, program workload, and the players' functional duties for improving the management of training and competitive process among players.

The *aim* is to substantiate the hierarchic structure of knowledge on the test system to control the athletes' performance in team sports games based on the synthesis of theoretical data, prominent practical experience, and our own experimental researches.

Material and methods: analysis of specialized research and methodological literature, analysis of documental materials, pedagogical observation, system method, synthesis and systematization of data.

Results. Based on system approach, the hierarchic structure of the awareness of the test system to control the athletes' performance in team sports games throughout long-term training was theoretically substantiated. Exemplified by the hierarchy element, such as requirements to the tests in basketball, the excerpt of the knowledge system on tests to control the athletes' performance in team sports games requiring the analysis of the tests not only for an individual player but for the group of players as well as for the whole team consider the peculiarities and direction of the tasks and program workload on different stages of long-term training.

Conclusions. The hierarchic structure of knowledge on the test system to control the athletes' performance in team sports games was theoretically substantiated. The detailed characteristic of the elements of the scientific knowledge hierarchy was given, such as requirements to the tests in basketball: reliability, specificity, informativeness, and relation to the stages of long-term training; relation to sensitive periods of physical qualities' development; relation to program material of the yearly training plan; complexity; number of participants; periodicity.

Key words: control, tests, hierarchy, team sports games, long-term training.

Introduction. The specificity of competitive activity and training system in team sports games shows the existence of considerable discrepancies compared to cyclic or individual sports. All of this leaves a mark on various components of the athletes' training system specializing in them, and one of the most popular focuses for scientific researches of the recent decade is searching for different approaches to improving the control system in team sports games [5, 13, 18, 19, 20].

Taking into account specific peculiarities of a sport has the greatest importance for selecting the indicators used in control as the achievements in different sports are caused by different functional systems requiring severe specific adaptation responses due to the manner of competitive activity.

Control tests are the main instrument of control and the most important method of research and methodological support since using them it is possible to identify: the level of physical workload, motion and mental qualities; dynamics of sporting results in the course of training, notably a long-term one; the degree of acquiring technical methods, their stability and efficiency; the drawbacks in the system of planning physical workloads; the benefits and drawbacks of the means and methods used in the course of training, etc. [7, 8, 10, 14].

In O.A. Shynkaruk's paper [15], the peculiarities of using tests in the course of controlling physical performance among athletes exemplified by the Olympic sports. The author focuses on the need to follow specific requirements in the course of selecting and developing tests, notably their correspondence with the athletes' age and qualification peculiarities, the specificity of sporting specialty, and reliability together with informativeness of the test indicators.

A.I. Valtyn, A.D. Leonov [3] suggested the methodology of determining the level of the basketball players' performance «M-100» having a few modifications and being universal for bringing the testing conditions closer to the competitive ones by different regimens of the shots' intensity.

In the training guide on tackling in basketball, V.H. Huba, S.H. Fomin and S.V. Chernov [4] have generalized various tests making it possible to assess the athletes' prominent skills to do team sports games having covered not only the determination of the level of physical and technical performance but also having established the psychophysiological state among young athletes.

L.P. Serhiienko [12] has analyzed a range of tests developed by foreign and national authors reflecting the manifestation of various kinds of coordination abilities.

V.M. Koriahin, N.Z. Blavt, and Y.A. Brizkin [2, 7] have suggested and modified a lot of ways of physical qualities' assessment, notably for the athletes specializing in team sports games.

Al-Fartusi, A. Diachenko [1], E.Y. Doroshenko, R.O. Sushko [18] have used a range of tests reflecting the basketball players' functional support in the course of completing different situational game actions with different heart rate workloads regimens.

O.O. Mitova and R.O. Sushko [8,

9] have generalized and analyzed more than 100 tests developed in different times by the scientists and specialists in basketball and systemized them according to the aspects of performance.

The analysis of foreign practice in sports games shows that the «NBA draft combine» tests also make it possible to assess the basketball players' abilities and level of their integral performance comprehensively [17, 20].

The Dutch scientist Y. Bengsbo had a great idea on developing the test whose structure consists in doing beep test with intensive interval physical workload, and the abilities were recovered after this workload. Moreover, measuring the heart rate (HR) in the course of completing the test makes it possible to determine individual peculiarities of the athlete's body in aerobic (mostly) and anaerobic regimens being specific for motion activity in team sports games [6].

Yet, the analysis of research and methodological literature and national regulatory documentation in different sports games shows imperfection of the test system as part of control system.

Most tests in sports games do not correspond to the current game rules, modernization of inventory and equipment and do not reflect group and team interactions or take into account spatiotemporal limitations of gaming activity as well, etc. All of this decreases the relevance of testing as well as informative and reliable indicators gained in tests [10].

So, the synthesis of theoretical data for theoretical substantiation of hierarchic structure of knowledge on the test system to control the athletes' performance in team sports games is now a relevant scientific question whose solving will make it possible to improve the system of control and management of training and competitive processes.

Connection of the work with research programs, topics and plans. The paper was completed according to the Composite scientific and research work plan in the sphere of physical education and sports for the years 2011-2015 of the approved by the Ministry of Education and Science of Ukraine on the topic 2.6 «Theoretical and methodological basics of improving training process and competitive activity in the structure of the athletes' long-term training» (state registration number 0111U001168) and The scientific and research work plan of Prydniprovia State Academy on Physical Education and Sport for the years 2016-2020 on the topic « Theoretical and methodological basics of planning and control in sports games throughout long-term improvement» (state registration number 0116U003012).

The aim of the research is to substantiate the hierarchic structure of knowledge on the test system to control the athletes' performance in team sports games based on the synthesis of theoretical data, prominent practical experience, and our own experimental researches.

Material and methods of the research.

Methods of the research: In the course of the research the following methods were used: analysis of specialized research and methodological literature, analysis of documental materials, pedagogical

observation, system method, synthesis and systematization of data.

The analysis of specialized research and methodological literature made it possible to figure out the current tendencies of the team sports games' development, conduct a retrospective analysis of theoretical and methodological basics of the control system in sport, the problematic fields of the control system in team sports games, the existence and using of different tests on team sports games' practice. The analysis of documental materials was used to determine the content and direction of the tests to control the athletes' performance in team sports games.

The system method consisted in studying the control system and test system in team sports games as an integral combination of elements in the set of relations between them, namely the analysis of control as a system model and the test system as an element of a hierarchic structure. The method of synthesis and systemizing of data was used to present the test system to control the athletes' performance in team sports games.

Organization of the research: the research was conducted based on Prydniprovia State Academy on Physical Education and Sport throughout the years 2015–2020.

Results of the research and discussion. On the precious stages of the research based on the analysis of research and methodological literature, current tendencies of the sports games' development, and our own practical experience, we substantiated the hierarchic structure of knowledge system on the control in team sports games on the first and second stages of long-term training.

We have analyzed control as an element of the training system of the athletes in team sports games and built the hierarchic structure of knowledge on the control in terms of system approach.

Based on the general theory of training the athletes in team sports games, on the first level of knowledge, the elements constituting the knowledge system of this stage include notably the *control in team sports games.* On the second level it is *control in the training system*, and on the third hierarchic level we have suggested three elements - *control of the player*, *control of a group of players*, and *control of the team.* Such approach is different from the general theory of sports and from individual sports.

On the fourth hierarchic level we have distinguished 12 elements: relation of control to the stages of long-term training; relation of control to the periods of yearly macrocycle; control in the training system; control of competitive activity; types of control; principles of control; organization of control; methods of control; criteria system; test system; assessment system. These elements can be considered separately, in interaction with each other, differentially and integrally.

The element of the hierarchy «Control in the training system» in team sports games is demonstrated in fig. 1.

So, control of performance can be subdivided into six main elements: control of physical, technical, tactical, theoretical, mental and integral performance.

For complex control of

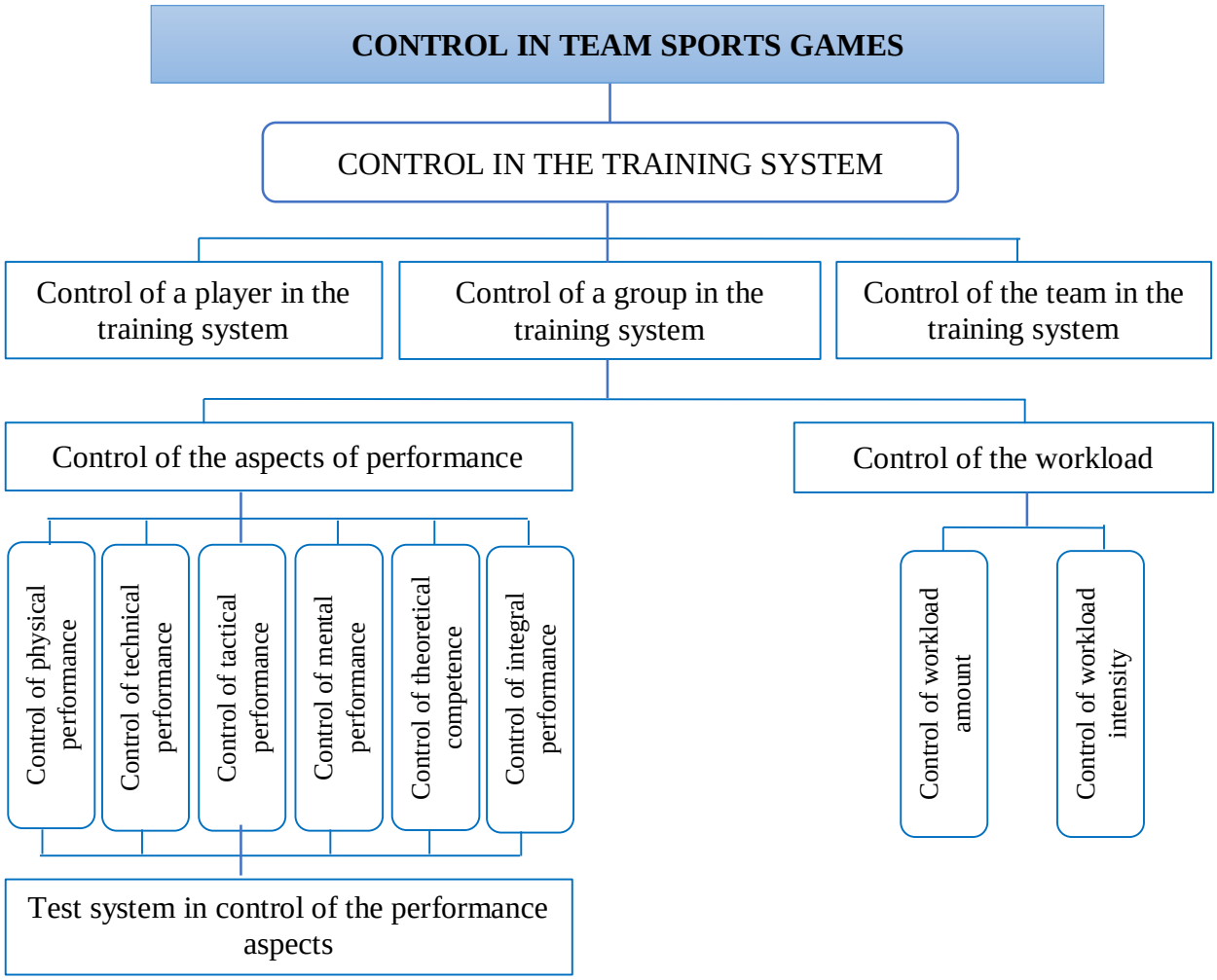

Figure 1. **Elements of the scientific knowledge hierarchy on controlling the aspects of the athletes' performance in team sports games**

performance among basketball players and for control of each type of performance independently on each stage of long-term training, the test system must be formed having its own specific peculiarities based on the analysis of the latest scientific researches in team sports games and agreed with the current theoretical statements of the athletes' training system in Olympic sport and control.

The main discrepancy between this test system and cyclic sports is that on each stage of long-term training the structure of competitive activity is considerably different from the previous stages by speed and variability of completing technical and tactical actions, mental conditions and tactical schemes of the game. Also, in the course of the training process the priority of the training aspects changes.

All of this can serve the basis both for developing a general test system in the course of the athletes' long-term training in team sports games and developing the test system on each stage of long-term training making it highly possible to solve the main tasks at the specific training cycle, correct the training process on time, and improve the management of training in the course of long-term improvement.

So, the general test system for control of performance in team sports games as an element of the hierarchy

on the following stage will rest on such element as requirements to the tests which for their part on the lowest level have nine elements different by direction but interrelated: reliability, specificity, informativeness, interrelation to sensitive periods of the physical qualities' development, interrelation to the stages of long-term training, interrelation to the program material of the curriculum, complexity, number of test participants, periodicity (fig. 2).

As a result of the analysis of research and methodological literature, practical and our own experience, the test system on each stage of long-term training must be developed based on expert assessment taking into account:

- the tasks of the long-term training stage;
- priority of the aspects of training in the content of program material for Youth sport school, Olympic reserve sports school and Higher performance sport school;
- the players' functional duties (position, duties within one position, status in the team);
- intensity of completing the test;
- variability of the technique of completing technical holds (one-hand high throw in motion, one-hand low throw in motion, fadeaway, etc.);
- spatiotemporal conditions of completing technical and tactical actions in the course of competitive activity (not only the amount of time needed for the test, but vice versa – completing the action or combination of technical and tactical actions in limited time);
- event regulations (refers more to children's events when these or those defense or offense types are limited, or simplified game rules);
- sensitive periods of the physical qualities' development;
- higher complexity of the inventory (heavier ball, decreased or increased by diameter), equipment (the ring decreased by diameter), etc.

Let us analyze some of these statements. For example, considering that completing any action in the course of competitive activity in team sports games is done not by a single athlete, but by a group of two-three people or a team, the test system as we see it must be coherent with these conditions.

So, all the tests can be systemized not only depending on the levels and stages of long-term training but also depending on the number of test participants, namely: tests for one player; tests or control exercises for a group of players; tests or control exercises for the team at the playground.

At the same time, on each following stage of long-term training the number of the tests for a group of players and for the team must grow compared to individual tests.

Namely, if on the two first stages of long-term training the focus on control is more concentrated on control of individual indicators and it is possible to use traditional tests for it, at the final stage of the previous basic training when the targeted learning to interact between two-three players begins, the tests must have the content of such control tests where two-three players would be involved with further increasing of the number of performers (depending on the number of players on the playground in a particularly mentioned sports game).

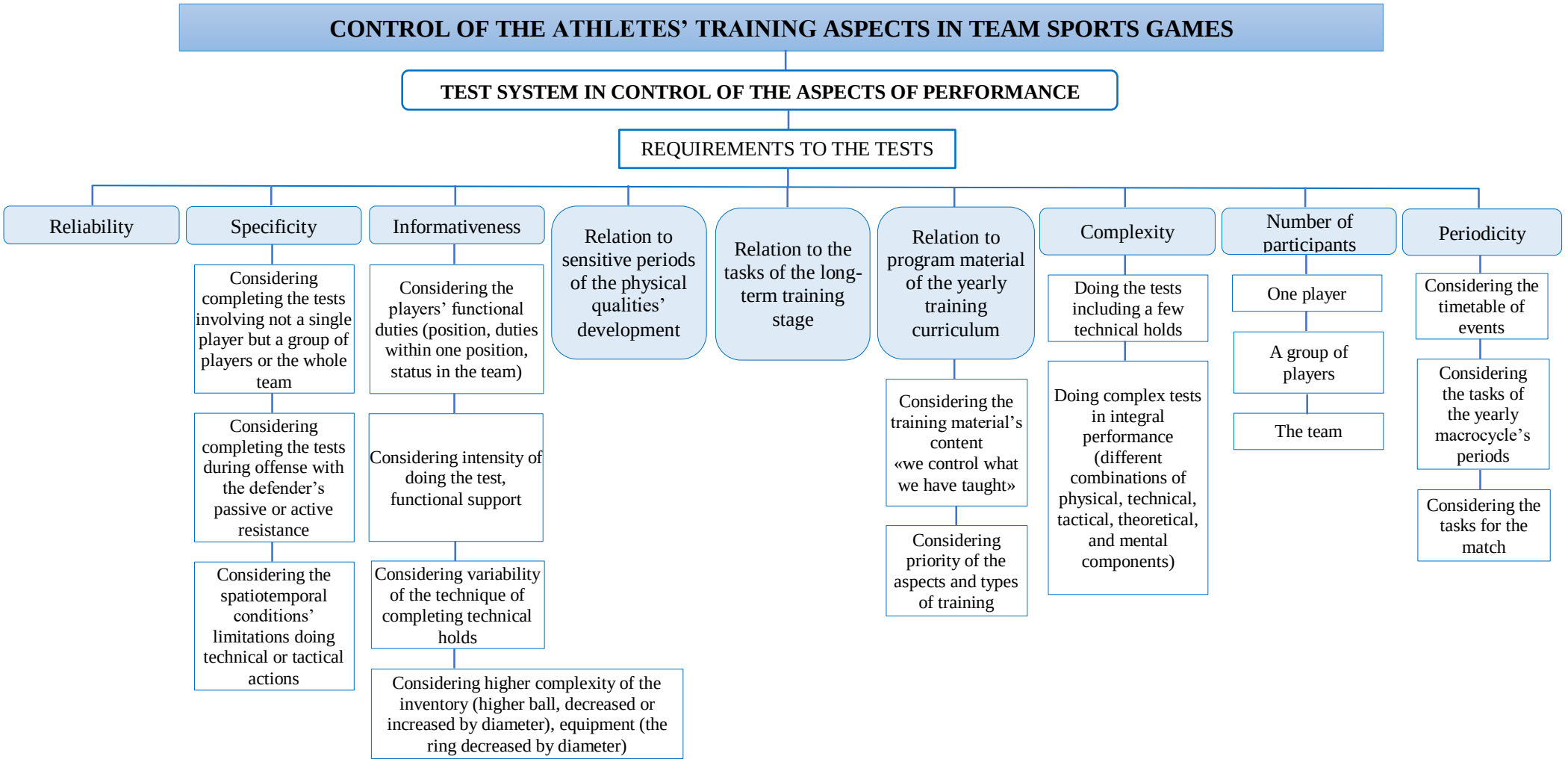

Figure 2. **Elements of scientific knowledge hierarchy on the test system to control the aspects of the athletes' performance in team sports games (exemplified by requirements to the tests in basketball)**

Namely, the group and the team are considered in this case not as a sum of different test participants' indicators but as a solid object.

For increasing the tests' informativeness in team sports games where there is a rival's resistance (basketball, handball, football, rugby, ice hockey, field hockey, etc.) the completing the tests not only with no resistance but also adding a defender's passive and active resistance is the principal condition for control tests related to the assessment of technical, technical and tactical as well as integral players' performance among players in offence. For example, in basketball the player has to commit throws with the rival's arm put out while his trying to cover the ball, etc.

If the tests are related to the actions on defense, it is relevant to introduce the tests with prevailing minority of players in defense towards players in offense to control tests, moreover, to make up mixed groups from the players of different game positions (the center against defenders, offenders against centers, etc.). Such approach makes it possible to expand variability of taking decisions in the course of completing actions upon condition of the rival's boosted speed and coordination abilities (in the case, the centers in offense against defenders in defense) and with increased parameters of body length and mass (in the case, the defenders in offense against centers in defense.

Also, on the stage of specialized basic training and the one to higher sporting skill which require studying the main tactical schemes (according to the curriculum for ДЮСШ, СДЮСШОР and ШВСМ), the tests or control exercises have to include the tasks of particular direction towards using these or those ways of offense or defense.

As for such element of the hierarchy as «specificity», considering the spatiotemporal conditions' limitations while completing technical and tactical actions, etc. is gaining relevance during the test selection.

The peculiarity of team sports games is the fact that most games have time limits for completing any kinds of actions. For example, in basketball 24 seconds are given to attack the ring, and 14 seconds are given to retrieve the ball for the attack of the tempo two. The cases when a few seconds for committing the attack are left often occur, and sometimes even the tenth of a second. The analysis of competitive literature shows that these are the conditions when the players cannot manage the ball, make mistakes, etc.

Creating simple or control tests in completing any technical and tactical actions in a limited period of time (for example, committing a throw in basketball in 0.3 seconds; committing combinations in 1.5-3 seconds for the whole team or group of players, etc.), conducting such control tests will make it possible for the trainer to assess the specific capabilities of certain players more thoroughly who can be contenders for committing the «final» throw during the match. Moreover, completing such control tests will promote adaptation among players to conditions of limited period of time, and boost their concentration towards economization of spatiotemporal motion parameters.

As for such element of the hierarchy as «informativeness», an

important factor is obligatory condition of completing tests as approaching intensity of completing technical and tactical actions to the competitive ones. For example, the throws during the test in basketball has to be completed with 180-200 bpm^{-1}, and not with 100-120 bpm^{-1}..

«Complexity» is the requirement including completing the tests whose content and conditions consist in committing a few technical holds or manifestation of a few physical qualities. Moreover, it is worth implementing control exercises or complex tests in integral performance, whose essence consists in various combinations of physical, technical, tactical, theoretical, and mental components of training, completing situational tasks changing suddenly and including the elements of unpredictability, etc. This is the approach in control making it possible to determine the degree of the players' fitness level for competitive activity in team sports games.

Discussion. The scientists conducting researches concerning control and analysis of the test system note the need in taking into consideration the latest achievements in the theory of sport, purpose of each stage and levels of long-term training aimed to enhance the quality of control and the training process management in the course of long-term improvement [1, 6, 8, 10].

At the same time, the analysis of the current test system in the curricula in basketball, football, handball, and other sports games demonstrates the existence of equal tests for all age categories of athletes in children and youth's sport, the discrepancies consist only in the criteria and scales of assessment; also the tests are mostly aimed to determine the individual performance of a single player [5].

Such situation proves our assumption on incoherence between the process and content of training and control system in team sports games.

In spite of controversial statements, considering the factors of current tendencies of team sports games development, and specificity of the athletes' training process specialized in them on each stage of long-term training is the basis for further studying, scientific substantiation and new tests' development possible to be integrated into control system.

Conclusions:

1. The analysis of research and methodological literature, current tendencies of team sports games' development and our own practical experience made it possible to scientifically substantiate the hierarchic structure of knowledge system on the test system of the athletes' physical performance in team sports games in the course of long-term training.

2. The specific peculiarities and requirements being worth considering in the course of development of the knowledge system on tests to control the athletes' performance in team sports games including the review of tests not only for a single player but also for a group of players and their team were analyzed; they consider the peculiarities, tasks' and program workload's direction on different stages and levels of long-term training; they also reflect the integrity, complexity and unpredictability of game actions among the players in team sports

games .

3. The elements of the hierarchic knowledge system on the tests to control the parties' performance in team sports games were determined, such as requirements to the tests: reliability, specificity, relation to the stages of long-term training; relation to the sensitive periods of the physical qualities' development; relation to program material of the yearly training curriculum; complexity; number of participants; periodicity.

All these elements of the hierarchy altogether and each one independently make it possible to consider the test system to control the athletes' performance in team sports games as a complex, dynamic structure caused by the impact of a range of factors specific for these sports as well as theoretical and methodological control basics.

We have complemented and broadened the theoretical statements of the predecessors on the test system in team sports games.

Prospects for further research are related to developing the hierarchic structure of knowledge to control the performance of a player, a group of players and the team in team sports games in the elements such as the system of criteria and the system of assessment considering the peculiarities of the stages and levels of long-term training.

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