The prerequisites for developing club abilities in rhythmic gymnastics based on the coordination requirements of the routines

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Abstract

Objective of the study was to provide a scientific foundation for the development of subject skills in rhythmic gymnastics, in accordance with the coordination profile of the exercises.

Methods and structure of the study. To accomplish this objective, a comprehensive evaluation of the technique for executing the fundamental elements of club activities was conducted by a panel of 15 highly skilled athletes from the Lesgaft National State University. The investigation was conducted during the preparatory phase, spanning from September to December 2024.

Results and conclusions. The primary types of coordination skills for each type of technical elements with maces are identified, along with specific objectives for the development of coordination skills for each type of technical elements with maces. It is discovered that one of the objectives is to teach gymnasts to vary the height of the center of gravity of the maces when executing rotational movements for mills. Additionally, gymnasts are equipped with methodological techniques to enhance their ability to control the direction of an object's descent when performing throwing actions with two maces.

Keywords: *rhythmic gymnastics, individual profile of gymnasts, coordination profile of exercises.*

Introduction. Most studies in the field of sports theory, when considering an individual profile from the position of interhemispheric asymmetry in the context of the success of the development of physical qualities and motor stereotypes [1, 3-5]. In the field of rhythmic gymnastics, the coordination profile of exercises was considered from the position of the criterion for selection and prediction of successful specialization [2]. However, in rhythmic gymnastics, given its specificity, it is necessary to consider coordination abilities not in isolation, but in connection with the work of the object. Knowledge of the coordination profile of exercises will allow a rational approach to the issue of mastering the basic skills of mastering the object. This study examines the basic elements with clubs, as one of the complex types of all-around for young gymnasts in connection with working with both hands simultaneously. As well as the relationship between the expert assessment of the basic work with clubs with indicators of coordination abilities and individual characteristics of athletes.

Objective of the study was to provide a scientific foundation for the development of subject skills in rhythmic gymnastics, in accordance with the coordination profile of the exercises.

Methods and structure of the study. To achieve the set objectives, the following was performed: analysis of scientific literature on the problem of coordination profile of exercises; sports and pedagogical testing, expert assessment, correlation analysis (methods of mathematical statistics). Sports and pedagogical testing implied assessment of indicators of coordination abilities: regulation of dynamic parameters and spatio-temporal parameters of movements (clubs balance (s); ball balance (s); hoop balance (s); accuracy of time reproduction (%); accuracy of spatial charac-

teristics reproduction (%); accuracy of muscle effort reproduction (dynamometry) (%)): rhythm of movements («tactile sensation (lower threshold)» (points); «mass discrimination threshold" (points); reproduction of a given rhythm, small circles with clubs» (%)); static and dynamic balance (Uemura test (points)); orientation in space and time (reaction to a moving object (s); motor asymmetry (s); intramuscular and intermuscular coordination (ability to control hand movements, as well as maintain visual control (%)); degree of muscle tension (myoton) using the Myoton PRO device; change in direction of movement and motor program (test «92-meter run with change of direction «Herringbone» with a windmill with clubs (s); test «Running to numbered stuffed balls» with performing a windmill with clubs in the lateral plane (s)). Expert assessment of the technique of performing basic elements of work with clubs (control exercises: throw, rotation, windmill) was carried out on a five-point scale; correlation analysis of the relationship between types of coordination abilities and expert assessment of the technique of performing basic elements of the object. Fifteen highly qualified athletes of NSU named after P.F. Lesgaft took part in the study.

Results of the study and discussion. When considering the coordination profile of the exercises, the importance of varying the height of the center of gravity of the object was noted, especially when performing the figure eight with the right club in the lateral plane with the left hand (r=0,97) and the horizontal mill with clubs (r=0,86).

The technique of throwing two clubs towards oneself depends primarily on the ability to regulate the direction of the object's fall (r=-0,81). Uncontrolled execution of club throws may result in the loss of the object due to the fact that the clubs fly apart in different directions. Regulation of the time parameters of movements during the opposite throw of two clubs (r=-0,88) allows performing the technical action simultaneously, since mainly due to the fact that the motor skills of the left hand lag behind the gymnast's right hand, the throw with the left hand is performed with a delay. Since most elements with clubs are performed with two hands, the expert assessment of the technique of their execution is largely determined by the accuracy of reproduction of muscle efforts. This is indicated by the revealed correlation relationships between the expert assessment of the technique of throwing, spinning and milling clubs and the dynamometry indicators (0,78≥r≥0,95). The level of development of the ability to regulate dynamic parameters of movements will especially determine the technique of performing a vertical club mill (r=0,95), a throw in the lateral plane with the left hand (r=0,91) and a parallel simultaneous throw of two clubs in the lateral plane (r=0,91).

Intermuscular coordination of the arm muscles is of great importance for performing a throw of two clubs with a movement away from oneself and two clubs with one hand in the lateral plane, as well as the technique of performing a club mill in the vertical, horizontal and vertical planes.

Thus, an inverse relationship was revealed between the expert assessment (scores) and the myotonmetry indicators of the biceps muscle of the arm in a tense state (-0,91≥r≥-0,79). The ability to tense and relax the muscles in a timely manner ensures free rotation of the clubs, especially when performing an asymmetric rotation of the clubs (r=0,82). The success of performing a throw in the lateral plane with the left hand, a parallel simultaneous throw of two clubs in the lateral plane and a throw of the other club from below with the right hand depends on the control over the relaxation of the biceps muscle of the right hand, in particular, at the moment of throwing the club, the muscles must be tense (0,82≥r≥0,87). These data are also confirmed by the relationship between the ability to control the movement of the hands, as well as maintain visual control (%) with the technique of performing asymmetric rotation of the clubs (r=-0,99). and a throw of the other club from below with the left club (r=0,98).

When performing throws with two clubs, both large and small, with incorrectly set kinematic parameters of movements in the starting phase of the throwing action, the gymnast's ability to change motor tasks when catching the clubs is of significant value (r=0,81). One of the conditions of technical work when performing a throw of opposite-handed clubs is a timely reaction to the catch of the second club performed by the non-dominant hand (r=-0,81).

Thus, the knowledge obtained made it possible to establish the conditions and tasks for the formation of skills in handling an object in rhythmic gymnastics in accordance with the coordination profile of exercises with clubs.

Conclusions. The conditions for developing skills in mastering the apparatus in rhythmic gymnastics exercises with clubs are a high level of development of coordination abilities in gymnasts already at the initial stage of sports training. The leading types of coor-

dination abilities for each type of technical elements with clubs were determined. Mathematical processing of the correlation analysis allowed us to define specific tasks for developing coordination abilities:

- to develop the ability of athletes to change the motor task under the condition of incorrectly specified parameters in the starting action of throwing clubs for an effective technique of performing a parallel simultaneous throw of two clubs in the lateral plane, throwing two clubs with a movement away from you, as well as throwing clubs of opposite names;

- to develop the ability of athletes to control the tension and relaxation of the biceps muscle of the arm when performing rotational manipulations with clubs (eights, club mills);

- to teach how to vary the height of the center of gravity of the clubs when reproducing rotational movements for mills; - to equip gymnasts with methodical techniques for developing the ability to regulate the direction of the fall of an object when implementing throwing actions with two clubs;

- to develop the tempo-rhythmic abilities of athletes, performing actions under a metronome to control the frequency and speed of throwing actions with clubs.

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