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DEVELOPMENT OF JUMPING IN 15-16 YEAR OLD VOLLEYBALL PLAYERS BASED ON THE APPLICATION OF EXERCISES AIMED AT LEVELING THE BODY AXIS.

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Abstract. The article reveals the possibilities of developing jumping ability in 15-16-year-old volleyball players based on the development and introduction into the training process of means aimed at balancing the body axis. Determination of the level of balance and assessment of the quality of balance management of athletes were carried out on the ST-150 MERA stable simulator. The effectiveness of applying the tasks developed for the three-directional block is confirmed by the results of the pedagogical experiment.
Keywords: jumping, volleyball, body axis, training process tools.

Introduction. The International Standard for Volleyball Sports Training provides for an increase in the number of hours of volleyball players' competitive training. This circumstance increases the requirement for the effectiveness of performing all technical techniques of volleyball, and the performance of technical and tactical actions in volleyball depends on the height of the jump.

The content of the literature on volleyball reveals the issues of explosive strength of leg muscles (jumping ability), quality of movement, features and components of jumping ability, means and methods of developing jumping ability, criteria for assessing jumping ability indicators in 15-16-year-old volleyball players [2, 4]. The issues of the concept of the axis and plane of the human body are also covered in sufficient detail [3]. However, the issue of developing jumping ability based on body axis correction in 15-16-year-old volleyball players is considered the least studied.

The purpose of the study is to improve the training process aimed at developing jumping ability in 15-16-year-old volleyball players based on body axis correction.

To achieve the set goal, the following tasks have been defined:

1. Determination of jumping indicators of 15-16-year-old volleyball players.
2. Determination of indicators characterizing individual deviations of the body axis in 15-16-year-old volleyball players.

3. Create tasks aimed at developing jumping ability in 15-16-year-old volleyball players, providing for correcting the body axis, and check the effectiveness of their application in the training process.

Theoretical significance: new knowledge was obtained about the means of developing jumping ability in volleyball players aged 15-16, which involves correcting the axis of the body.

Practical significance: the individual body characteristics and body axis of 15-16-year-old volleyball players were determined. Tasks for developing jumping ability and correcting the body axis have been compiled, the application of which allows increasing the indicators of jumping ability in 15-16-year-old volleyball players.

Scientific novelty: the work proposes means of the training process, providing for the correction of the axis of the body, which can be recommended for the development of jumping ability in 15-16-year-old volleyball players. The exercises are developed taking into account the specifics of volleyball and include the results of modern research in this sport.

Methods and organization of the research. The content of training sessions for the development of jumping ability in 15-16-year-old volleyball players of the experimental group was carried out on the basis of exercises aimed at correcting the axis of the torso. The exercises were divided into three blocks.

Block 1. Exercises aimed at strengthening the musculoskeletal system of the ankle joint.

Block 2. Exercises aimed at strengthening the muscles of the back and spine.

Block 3. Exercises aimed at developing jumping ability and improving the quality of balance control.

Two exercises from each block were performed at the end of the preparatory part and at the beginning of the main part during the training. The time for completing the tasks is 15-20 minutes. The exchange of tasks was carried out at the beginning of the weekly cycle. When performing each exercise, the load was determined taking into account the individual characteristics of the athlete.

When performing the exercises compiled during the training, the following load norms were provided: 6 exercises performed in sets (4 sets), rest intervals between sets 1-2 minutes.

To solve the set tasks, the following research methods were used:

1. Theoretical analysis and generalization of literary sources.
2. Medical-biological examination.
3. Sports-pedagogical testing.

4. Pedagogical experiment.
5. Methods of mathematical processing of research results.

The research was conducted for six months. 24 individuals, who formed the control and experimental groups, participated in the study.

Research results and their discussion. Before the pedagogical experiment, sports-pedagogical and medical-biological tests were conducted. For this purpose, three control exercises were used: jumping up from a standing position, (cm.); jumping up after three steps, determining the difference between the player's maximum delivery and height with an extended arm (cm.); jumping up after three steps, taking the maximum height (cm.). Analysis of jumping indicators in the groups revealed statistically significant differences at a significance level of 0.05 in each of the three tests. The indicators of jumping were high in group A and low in group B (first test indicators - 66.16±1.29 cm. and 55.16±1.21 cm., second test - 70.5±1.19 cm. and 59.83±1.05 cm., third test - 295.91±1.51 cm. and 281.16±1.7 cm., respectively).

The level of balance and the quality of balance control were also assessed on the MERA ST-150 stabilizer[1]. When assessing the balance function and the quality of balance control, statistically significant differences were revealed between groups A and B (speed indicators of the pressure center 35 and 21 millimeters per second, oscillation frequency indicators 30 and 27 Hertz, respectively).

Group B, which had lower jumps, a lower level of balance, and a lower quality of balance control, was designated by us as an experimental group.

After the pedagogical experiment, repeated medical-biological and sports-pedagogical tests were conducted. In the experimental group, the equilibrium indicators and the quality of equilibrium control increased (indicators in the pressure center velocity group - 56 millimeters/second, vibration frequency indicators - 74 Hertz, respectively). In the control group, the indicators did not change. In the experimental group, the indicators of jumping ability increased, which correspond to the average level of training.

The jumping indicators have statistically significant differences in all three tests at a significance level of 0.05. Comparison of the indicators of jumping ability in the experimental group is presented in Table 1.

Comparison of jumping indicators in the experimental group (EG) before and after the pedagogical experiment

Table 1

Indicator	Results ($X \pm S_x$)	**P** value	Summary of

	before EG	then EG		differences
Standing jump, (cm.)	55,16±1,21	61,58±1,18	0,001	p≤0,05
After three steps, jump upwards, determine the difference between the magnitude of maximum reach and the player's extended arm height (cm).	59,83±1,05	65,66±1,06	0,0008	p≤0,05
After three steps, jump up to maximum height (cm.)	281,16 ±1,78	288,0 ±1,46	0,007	p≤0,05

The results show that after the pedagogical experiment, the indicators of jumping ability in the experimental group increased.

Analyzing and summarizing the above, it can be concluded that to improve the jumping ability of 15-16-year-old volleyball players, it is advisable to include exercises aimed at aligning the axis of the athletes' bodies in the training process.

Summary:

1. It is advisable to develop tasks aimed at correcting the axis of the torso in volleyball players aged 15-16 in 3 blocks:

Block 1. Exercises aimed at strengthening the musculoskeletal system of the ankle joint:

Block 2. Exercises aimed at strengthening the muscles of the back and spine.

Block 3. Exercises aimed at developing jumping ability and improving balance control.

2. The effectiveness of the developed sets of exercises was proven by the results of medical-biological testing and sports-pedagogical testing. In the volleyball players of the experimental group, the balance function and the quality of balance control improved. The jumping indicators of the volleyball players of the experimental group had statistically significant positive dynamics in all three control exercises (tests) (stand-up test - 55.16±1.21 cm. and 61.58±1.18 cm., jump after three steps - 59.83±1.05 cm. and 65.66±1.06 cm., jump after three steps with maximum height - 281.16±1.78 cm. and 288.0±1.46 cm., respectively).

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