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JUMP TRAINING FOR YOUNG BASKETBALL PLAYERS AGED 13-15: EFFECTIVENESS OF THE PLYOMETRIC PROGRAM

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Annotation. The paper deals with the problem of purposeful development of jumping ability in teenage basketball players. The age of 13-15 years is characterized as a sensitive period for the development of speed and strength abilities, which creates favorable prerequisites for the inclusion of plyometric exercises in the training process. The aim of the study was to evaluate the effectiveness of a 12-week jump training program based on plyometric exercises in basketball players aged 13-15 years. The experiment involved 30 athletes, the program included three classes per week. The Bosco test (Squat Jump, Countermovement Jump, Abalakov Jump) was used to evaluate jumping performance Jump. At the end of the program, statistically significant improvements were recorded in all three indicators ($p < 0.001$), the effect value was estimated as large. The results obtained confirm the expediency of including structured plyometric training in the training process of young basketball players at the stage of advanced specialization.

Keywords: jump training, plyometric training, basketball, young athletes aged 13-15, vertical jump, Bosco test, sensitive period, speed and strength abilities.

Basketball refers to sports in which jumping ability is one of the key physical qualities that determine the effectiveness of jump shots, ball picking fights, and blockedshots. The age period of 13-15 years is a sensitive window for the directed development of speed and strength abilities: at this time, there is an active increase in the level of testosterone and growth hormone, which contributes to the natural development of muscle strength and power. Current meta-analytical studies confirm that plyometric training, based on the use of a stretch-contraction cycle, is an effective strategy for improving jumping performance in adolescent basketball players. At the same time, the issues of optimizing the volume and structure of plyometric load in this age group remain debatable, which determines the relevance of this study.

The aim of the study was to evaluate the effectiveness of a structured 12-week jump training program based on plyometric exercises for improving vertical jump performance in basketball players aged 13-15 years.

The experiment involved 30 male basketball players aged 13-15 years. The study was constructed as a quantitative pre-experiment with a "pretest–posttest" design. The jump training program lasted 12 weeks and included three training sessions per week lasting 60 minutes. The content of the program included plyometric exercises of shock and mixed types: backstroke jumps, squat jumps, arm swing jumps, long jumps from a standstill, as well as exercises on a pedestal and over barriers. To assess jumping performance, the Bosco test was used, which included three types of jumps: Squat Jump(squat jump), Countermovement Jump (Countermovement jump) and Abalakov Jump (swing jump). Statistical data processing was performed using the nonparametric Wilcoxon test for related samples; the significance level was assumed at $p < 0.05$. The effect value was estimated using the coefficient r.

At the end of the 12-week program, statistically significant improvements were recorded in all three test indicators (Table 1).

Table 1. Dynamics of Bosco test parameters (M ± SD)

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Indicator	Pretest, see	Posttest, see	Z	p	r
Squat Jump	28,43 ± 2,71	31,72 ± 2,48	– 4,63	< 0,001	0,85
Countermovement Jump	31,84 ± 2,94	35,61 ± 2,63	– 4,81	< 0,001	0,88
Abalakov Jump	35,26 ± 3,15	39,74 ± 2,91	– 4,72	< 0,001	0,86

These values correspond to the data of a published study conducted on a similar age sample of basketball players aged 13-15 years. The differences between the pre - and post-test turned out to be highlysignificant, and the effect value was estimated as large, which indicates the practical significance of the obtained shifts. The data obtained are consistent with the results of meta-analytical reviews that confirm the effectiveness of plyometric training for improving jumping performance in young basketball players. In particular, it was found that a low-frequency (1-2 times a week) protocol with a high volume of jumping exercises and a mixed type of load provides a significant improvement not only in jumping ability, but also in other components of athletic fitness. At the same time, the question of the comparative effectiveness of different volumes of plyometric load remains open: there is evidence that low and high volumes can give similar results in jumping indicators, while low volume is more economical.

Conclusions. The structured jump training program, implemented for 12 weeks with a frequency of three sessions per week, demonstrated high efficiency in improving the vertical jump performance of basketball players aged 13-15 years. The results obtained confirm the expediency of including plyometric exercises in the training process at the stage of advanced specialization. A promising area of further research is the differentiation of jumping load taking into account individual rates of biological maturation, as well as comparison of the effectiveness of various plyometric training protocols (shock, mixed and combined with strength training) in this age group.

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