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DYNAMICS OF INDICATORS OF COORDINATION ABILITIES OF BASKETBALL PLAYERS OF PRIMARY TRAINING GROUPS UNDER THE INFLUENCE OF USING SPECIAL PREPARATORY EXERCISES

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Purpose: to determine the degree of influence of special preparatory exercises on indicators of coordination abilities of basketball players of initial preparation groups.

Material and methods: the study involved 40 athletes aged 9 - 11 years, that are part of initial training groups of the second year of study in the sports school № 7 in Kharkiv (control group 20 athletes, experimental group 20 athletes). To establish the indicators of coordination readiness of young basketball players, the standard test exercises proposed by L.P. Sergienko [13] were used.

Results: in the training process of the experimental group of special - preparatory exercises were used: various jumps and acrobatic exercises, as well as sets of exercises on a trampoline. This technique had a positive effect on the coordination abilities of basketball players in the initial training group, and significant differences were found between the results before and after the pedagogical experiment ($p<0,05$).

Conclusions: the positive dynamics of coordination abilities indicators of the experimental group is established after the pedagogical experiment. Thus, in testing the control of evaluation and regulation of spatio-temporal and dynamic parameters

of movements, the improvement of results in percentage was from 9 % to 43 %, in testing the evaluation of sense of time the increase in results ranged from 27% to 56%, improvement of muscle accuracy efforts ranged from 3 % to 16 %, the dynamics of indicators of control of spatial orientation was from 7 % to 43 %, the results of control of stability of static and dynamic balance after the pedagogical experiment improved from 14% to 18%, indicators of sense of rhythm changed by 7 %, indicators of control of the ability to arbitrarily relax muscles improved by 3 %, the results of control of coordination of movements were increased by 31 % ($p>0,05$).

Keywords: basketball athletes, coordination abilities, specially selected sets of acrobatic exercises, trampoline exercises.

Introduction

The deterioration of the performance of Ukrainian basketball players at competitions of various levels has recently become stable. Yes, eight years ago, the Ukrainian masters of the orange ball were among the Top 6 best teams in Europe. In the 2020 season, the best result of the men's team was only entering the Top 16 teams of the European Cup.

Many experts express their opinion on this issue. According to L. Poplavsky, the rapid deterioration of results is due to errors in team management during the competition and its staffing [8].

The results of research [5] indicate a general low level of sports and pedagogical staff of the industry, and, as a consequence, shortcomings in the preparation of sports reserves.

A. Timofeev notes that this situation is related to the problems of financing children's and youth sports [1].

However, in our opinion, the main issue is the involvement of the most talented young men and women, physically developed, with sufficient anthropometric data to play basketball [11-14].

In the system of physical training of young basketball players a special place belongs to the development and improvement of coordination skills [6-9]. Developed

coordination skills allow young athletes to learn better, more accurately assess the spatial, temporal, dynamic parameters of their movements, accurately and quickly perform motor actions in unusual conditions, navigate in time and space, even anticipate changes in motor actions, perform movements efficiently and effectively [7].

Sufficient attention has been paid to the problem of studying and improving the coordination abilities of different contingents of people in the scientific and scientific-methodical literature.

In the theory and methods of physical education in-depth study of the development and improvement of coordination skills of different contingents of children engaged Krutsevich T. (2005), Lyakh V. (2006), Bala T. (2015).

In sports games the work of Gorchanyuk Y. (2016), Moiseenko O. (2018), covered this issue in terms of improving certain functions of analytical systems.

Research Nesson O. (2017) experimentally confirmed the positive dynamics of the development of coordination skills after the introduction of complex coordination exercises in the educational and training process of handball in 13-14 years.

According to the results of research [6], the author considered the role of coordination skills in the system of training qualified basketball players. The paper proved their influence on the performance of athletes in competitions of different levels.

Pomeshchikova I., Chucha N., Pashchenko N. dealt with the problem of improving different types of coordination of young basketball players. [7 - 9].

Despite the fact that many problems were devoted to the problem of development and improvement of coordination abilities of young basketball players, many issues are open and need further consideration.

Therefore, the **purpose** of our research was to determine the degree of influence of special - preparatory exercises on the indicators of coordination abilities of basketball players of initial training groups.

Material and Methods of research

The following research methods were used in the work: theoretical analysis and generalization of scientific and methodical literature, study of documentary materials and pedagogical observation, pedagogical testing, pedagogical experiment, methods of mathematical statistics.

The following test exercises proposed by Sergienko L. were included in the pedagogical testing. Testing of coordination abilities took place according to the indicators: shuttle run from 3x10 m with running around stuffed balls (s), shuttle run 4x9 m with a basketball (s), jumping on the marking (cm), passing the basketball on speed and accuracy (s), a test to assess the ballistic coordination of movements, running errors on the spot at an average pace of 5 and 10 s, the maximum wrist dynamometry of the right and left hand, and the differentiation of muscular effort 50% of the maximum (kg), throws the ball into the target, standing with his back (points), estimates of spatial accuracy movements, in the shoulder and hip joints 45^0 and 90^0, static balance according to the method of Bondarevsky (c), dynamic balance when performing turns on a gymnastic bench (c), sprint in a given rhythm (c), the ability to arbitrarily relax muscles (points) , comprehensive control of coordination of movements, evaluation of test results "ten eights".

The study involved 40 athletes aged 9 to 11 years. Among them there were 20 boys-basketball players studying in groups of initial preparation of the second year of training in sports school № 7 of the city of Kharkiv which were a part of the control group, and 20 boys-basketball players studying in groups of initial preparation of the second year of training of sports school № 7 of the city of Kharkiv who were a part of the experimental group. Athletes who participated in the study had the consent of their parents and studied with different coaches - teachers.

Results of the research

For four months, the training process of the experimental group was supplemented with a set of special exercises in acrobatics, modified moving games and specially selected exercises on the trampoline.

During the pedagogical experiment, the young athletes gradually increased the load: increased the dosage, complexity and speed of exercise.

Specially selected load varied taking into account the age, physical fitness and individual characteristics of the athletes involved. Special exercises were included in the preparatory, main and final parts of the lesson, which are presented in table 1.

Table 1

Additional educational material for conducting a pedagogical experiment

№	Content of educational material	Load	Distribution of educational material within the annual macrocycl
1.	**Acrobatic exercises.** Grouping, racks on the shoulders, forearms and arms, rolls forward, backward. Wheel coup. "Bridge". Varieties of basketball falls, which were combined with the above and simulation exercises.	Small	General preparatory stage
2.	**Jumping exercises.** Jumps from different starting positions, moving forward, with turns. Varieties of jumping using a gymnastic bridge. Jumping exercises with tasks (asymmetrical work of arms and legs).	Great	General preparatory stage
3.	**Exercises using a gymnastic trampoline.** Walking, classes of different starting positions and their combination, small jumps along the entire plane of the trampoline, pace jumps with a gradual increase in takeoff height, after performing different height jumps on the task. Complexes of the above exercises.	Average	General preparatory stage
4.	**Modified mobile games.** Modified mobile games and relays	Average	General preparatory stage

During 4 months, the training process of the experimental group was supplemented by specially selected exercises aimed at developing different types of coordination. The process of physical training was complicated by various jumping movements, overturns, racks, which were performed both in the main and reverse, as well as various exercises on the trampoline. The selection of educational material was aimed at the accumulation of motor skills and the development of the ability to master, and the variable application of game techniques. Exercises on the trampoline led to the development of special jumping skills. The training microcycle of the experimental group is presented in table 2.

Table 2

Training weekly cycle of classes for groups of initial preparation of the second year of study at the general preparatory stage

Day	№ Class	The predominant focus	Dosage (min.)	Load
Mon.	**1**	Improving individual technical skills, types of gears. Development of special flexibility, acrobatic exercises. Moving game	90	Small
Wed.	**2**	Improving speed - strength and special dexterity, exercises on a gymnastic trampoline.	90	Average
Mon.	**3**	Improving individual technical skills, types of throws. Development of special flexibility, acrobatic exercises. Moving game.	90	Small
Sat.	**4**	Improving individual technical skills, types of gears. Development of speed - strength qualities, jumping exercises. Relay.	90	Average

.The results of testing the coordination abilities of the basketball players of the experimental and control groups after the introduction of special training exercises in the training process are presented in table 3.

Table 3

Indicators of coordination abilities of basketball players of control and experimental groups after carrying out pedagogical experiment (n = 40)

Motor tests	CG after the experiment (n = 20)	EG after the experiment (n = 20)	t	p
	$\overline{X} \pm m$			
Control of the ability to assess and regulate the spatial - temporal and dynamic parameters of movements				
Shuttle run 3x10 m with running of stuffed balls (s)	9,71±0,42	9,31±0,62	0,53	>0,05
Shuttle run 4x9.14 m with basketball (s)	20,01±1,36	18,47±0,85	0,96	>0,05
Marking jumps (cm)	9,21±0,91	6,71±0,81	2,08	<0,05
Basketball transfer ball speed and accuracy (s)	29,41±2,11	26,43±1,01	1,27	>0,05
Test to assess ballistic coordination of movements (cm)	1,01±0,43	2,26±0,42	2,08	<0,05

continuation of table 3

Evaluation of the sense of time				
Error running on the spot at a medium pace (5 s)	1,41±0,42	0,92±0,51	0,74	>0,05
Error running on the spot at a medium pace (10 s)	1,76±0,51	1,43±0,45	0,49	>0,05
Estimation of accuracy of muscular efforts				
Error reproducing maximum effort (100% of maximum), right hand (kg)	5,76±1,72	5,54±1,43	0,10	>0,05
Error reproducing maximum effort (100% of maximum) left hand (kg)	4,43±1,02	4,23±1,51	0,11	>0,05
Error reproducing maximum effort (50% of maximum) right hand (kg)	3,52±1,21	3,13±1,02	0,25	>0,05
Error reproducing maximum effort (50% of maximum) left hand (kg)	3,16±0,91	3,24±1,62	0,04	>0,05
Control of spatial orientation abilities				
Throws the ball into the goal, standing with his back to it (points)	7,74±1,33	8,46±0,92	0,45	>0,05
Error reproducing angular movements in the shoulder joints (45°)	8,51±0,92	5,12±1,21	2,23	<0,05
Error reproducing angular movements in the shoulder joints (90°)	8,11±1,12	4,91±0,92	2,21	<0,05
Error reproducing angular movements in the hip joints (45°)	7,45±1,34	6,76±1,73	0,32	>0,05
Error reproducing angular movements in the hip joints (90°)	9,43±1,12	9,04±1,73	0,19	>0,05
Equilibrium stability control (static and dynamic)				
Static equilibrium according to the method of Bondarevsky (with open eyes) (s)	22,47±2,01	30,84±2,13	2,86	<0,01
Dynamic balance when performing turns on a gymnastic bench (s)	9,78±1,12	7,14±0,62	2,08	<0,05
Rhythm control				
Sprint difference in a given rhythm (s)	1,64±0,72	1,45±0,43	0,23	>0,05
Indicators of the ability to arbitrarily relax muscles				
Ability to relax muscles arbitrarily (points)	3,71±0,33	3,91±0,21	0,51	>0,05
Control of coordination of movements				
Comprehensive control of coordination of movements, evaluation of test results "ten eights"	14,34±1,83	11,34 ±1,41	1,30	>0,05

The results of coordination abilities of control and experimental groups after pedagogical experiment in testing control of ability to assess and regulate spatio-temporal and dynamic parameters of movements, jumps on marking and test for assessment of ballistic coordination of movements reproduction of angular movements in the shoulder joints (90°), indicators of static and dynamic equilibrium

found significant differences between the results of the two groups, and these differences are significant and statistically significant ($p < 0,05$) (table 3).

There were no significant differences between the test results of other indicators ($p > 0,05$).

Conclusions / Discussion

Analyzing the dynamics of the coordination abilities of the control and experimental groups after the pedagogical experiment, it was found that they improved, and amounted to the following: at 9 % ($t=0,53$; $p>0,05$); in the results of testing the 4x9m shuttle run with a basketball (s), changes were found by 15 % in the control group and by 24 % in the experimental group ($t=0,96$; $p>0,05$); the indicators of marking jumps changed in the direction of improvement in percentage - in the control group by 3 %, in the experimental group by 43 % ($t=2,08$; $p<0,05$); changes in the results of passing the basketball on speed and accuracy were recorded at the mark - in the control group 14 %, in the experimental group by 18 % ($t=1,27$; $p>0,05$); comparing the testing of the assessment of ballistic coordination of movements, a double prevalence of the indicators of the experimental group over the results of the control; the results of on-site running testing at an average pace of 5 s - in the control group changed by 22 %, in the experimental group by 56% ($t=2,08$; $p<0,05$); the dynamics of running on the spot at an average pace of 10 s, was similar - in the control group there were changes by 18 %, in the experimental by 27 % ($t=0,74$; $p>0,05$); changes in the error of reproduction of the maximum force (100 % of the maximum) of the right hand after the experiment - in the control group set 3 %, in the experimental result was repeated, and also set 3 % ($t=0,10$; $p>0,05$); the dynamics of the error of reproduction of the maximum force (100 % of the maximum) of the left hand - in the control group was – 2 %, in the experimental – 5 % ($t=0,11$; $p>0,05$); changes the error of reproduction of the maximum effort (50 % of the maximum) of the right

The analysis of indicators of control of abilities of orientation in space on indicators of throws of a ball in the purpose, standing with its back, shows that in control group they made 4 %, in experimental 15 % ($t=0,45$; $p>0,05$); in the

reproduction of angular movements in the shoulder joints (450) the error decreased - in the control group by 8 %, in the experimental group by 42 % ($t=2,23$; $p<0,05$); a similar trend was observed in the testing of the error of reproduction of angular movements in the shoulder joints (90°), so in the control group these changes were 16%, in the experimental 43 % ($t=2,21$; $p<0,05$); reproduction of angular movements in the hip joints (45°) test participants managed to improve, in the control group by 9%, in the experimental group – by 13 % ($t=0,32$; $p>0,05$); when reproducing angular movements in the hip joints (90°) the error decreased - in the control group by 5%, in the experimental group by 7 % ($t=0,19$; $p>0,05$); improvement of static equilibrium according to the method of Bondarevsky – in the control group was 6%, in the experimental 14% ($t=2,86$; $p<0,01$); dynamic equilibrium when performing turns on the gymnastic bench changed - in the control group by 4 %, in the experimental group by 18% ($t=2,08$; $p<0,05$); changes in sprint parameters in a given rhythm were found - in the control group 6%, in the experimental group 7 % ($t=0,23$; $p>0,05$); the ability to arbitrarily relax the muscles improved - in the control and experimental groups by 3 % ($t=0,51$; $p>0,05$); the results of the control of coordination of movements, according to the evaluation of the test "ten eights" improved in the control group by 14%, in the experimental group by 31 % ($t=1,30$; $p>0,05$).

Analysis of literature sources shows that this problem is not new. The introduction of specially selected sets of exercises on the coordination ladder into the educational and training process of beginners helped both to improve the indicators of coordination abilities and indirectly influenced the results of physical fitness of students - athletes [4].

According to the results obtained by Bykova O. O., complexes of specially selected exercises, the indicators of coordination of handball players of basic training groups were improved [3].

Thus, the analysis of statistical material found that the studied indicators of control of the ability to assess and regulate spatio-temporal and dynamic parameters of movement, the ability to orient in space, stability of static and dynamic balance, control of rhythm, ability to arbitrarily relax muscles and control coordination

movements after the introduction of complex exercises in the educational and training process of young basketball players with a difficult coordination orientation have improved, and according to the indicators of marking jumps, ballistic coordination test, errors of reproduction of angular movements in shoulder joints (450 and 900), the results of the experimental group prevail such control.

Comparing the indicators obtained after the pedagogical experiment with the results of Sergienko L. their improvement is established.

Prospects for further research. In the future in this direction it is interesting to determine the impact of a system of special complex coordination exercises on the indicators of physical fitness of young basketball players.

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