Journal of Physical Education and Sport ® (JPES), 18(Supplement issue 4), Art 268., pp.1831 - 1838, 2018
online ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051 © JPES

Original Article

Development of coordination abilities as the foundations of technical preparedness of rugby players 16-17 years of age

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Published online: October 31, 2018
(Accepted for publication August 30, 2018)
DOI:10.7752/jpes.2018.s4268

Abstract:
Purpose: substantiation and development of a methodology for developing the coordination abilities of rugby players of 16-17 years as the basis of technical readiness. Material and methods of research: 30 rugby players aged 16-17 who participated in the Junior Championship of Ukraine participated in the study. A special program of coordination training was developed, which contributed to the manifestation of technical preparedness in the difficult competitive conditions of the rugby team. The level of influence of coordination abilities on technical preparedness was determined by the correlation coefficient between these indicators. Result: a special program for the development of coordination abilities for rugby players aged 16-17 was developed, which included a system of exercises aimed at increasing vestibular stability, accuracy of reproduction of traffic parameters after various abrupt stops, rotations and confrontations of athletes of the opposing team. Indicators of tests of coordination abilities reliably correlate with indicators of technical preparedness of athletes. Conclusion: conducted researches made it possible to justify the necessity of introducing these parameters of the program, which are based on adaptive regularities of the athlete's body systems to physical loads and reliably correlate with the indicators of technical readiness.
Key words: rugby, coordination abilities, special exercises, correlation.

Introduction

It is known that sports games are related to sports, the motor activity of which is built on the basis of complex co-ordinated movements carried out in conditions of high intensity and confrontation (Nosko, Vlasenko, & Manievich, 2001; Platonov, 2015; Rovniy, Pasko, Dzhym, & Yefremenko, 2017).

For rugby the most characteristic are such motor qualities as strength, speed, strength endurance (Pasko, 2016; Rovniy, Pasko, & Martyrosyan, 2017). Equally important is the level of development of coordination abilities, as their level of development determines the technical capabilities of training athletes (Bykova, Druz, Pomeshchikova, Strelnikova, Strelnikov, Melnyk, & Shyriaieva, 2017; Sadovskij, 2003).

Coordination ability is a means of harmonizing individual elements of the movement in a single system for solving a specific motor task, which manifests itself in the accuracy and timeliness of its implementation (Bykova, 2016; Sogut, 2017).

In recent years, many scientists have focused on understanding the concept of "coordination abilities" (Bolotin, & Bakayev, 2018, Bykova, 2017). It is proved that the development of coordination abilities should be an integral part of the training process (Chagas, Ozmun, & Batista, 2017; Doroshenko, 2013), as their level determines the level of technical preparedness of athletes (Deprez, Fransen, Lenoir, Philippaerts, & Vaeyens, 2015; Nicole, & Nicole, 2017).

It proved the importance of the individual coordination abilities, such as rapid response to competitive conditions, and the ability to rebuild the physical actions depending on the type of sports activity for the development of technical elements (Hirtz, Ludwig, & Ludwig, 2009; Martyrosyan, Pasko, Rovnyi, Ashanin, & Mukha, 2017). Based on the analysis of literature (Liakh, 2006, Liakh, & Vitkovskij, 2010), it can be argued that the existing concepts for improving coordination abilities in sports are not sufficiently substantiated, especially in sports games. These provisions determine the relevance of these studies, theoretical and practical importance for improving the effectiveness of training rugby players using the methodology of developing coordination abilities in combination with the improvement of technical elements of the game.

Proceeding from the foregoing, the **purpose** of the presented work was the development of a methodology for developing the coordination abilities of rugby players aged 16-17 on the basis of adaptive

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regularities in maintaining the working posture of rugby players, reproducing the specified parameters (temporal, spatial, power) movements, reaction of choice and reaction to a moving object in competitive conditions.

Materials and methods

Participants

As the basic materials of the study, the indicators of the coordination abilities of 30 rugby players that are participants of the Championship of Ukraine among 16-17-year-old athletes are used. The experimental group consisted of 15 athletes (7 forwards and 8 defenders) from "Veres" team in Rivne. The control group was also formed from 15 athletes (7 attackers and 8 defenders) of the team "Sokol" in Lviv

Procedure (organization of the study)

For the study, a special program for the training of rugby players was developed, including not only special effects for the development of special physical qualities, but also exercises for the development of coordination abilities that were carried out in conditions close to the competitive.

The construction of an experimental training program was based on the generalization of practical activity and data from scientific and methodological literature on the general patterns of adaptation of the body's systems to stresses (Platonov, 2015), the laws governing the development of coordination abilities of athletes (Bykova, 2017, Nosko, Vlasenko, & Manievich, 2001) motor skills, as well as the ability of functional systems to various changes in the extreme conditions of competitive activity.

In developing the experimental methodology for developing coordination abilities, the unevenness and heterochronicity of the reaction of morphofunctional systems to specific loads were taken into account (Rovniy, Pasko, Dzhym, & Yefremenko, 2017; Rovnyi, & Pasko, 2017). Selection of special training exercises was carried out on the basis of modeling certain game situations. Therefore, the basic background of the impact on the body was created by running and jumping exercises on the basis of which strength, speed-strength and complexly coordinated exercises were performed.

The methodology of special training of rugby players was characterized by a multicomplex set of special exercises. A characteristic feature of the construction of training sessions was the development of the ability to vary the extrapolation of the exercise, that is, the athletes did not know in advance what movements will be performed, in which direction, and which signal should be reacted.

The experimental methodology of coordination training of rugby players of 16-17 years, designed for four months, was introduced in the preparatory period of the annual macrocycle of the experimental group. The total load of the training sessions for the athletes of the experimental and control groups was 26 hours per week, which meets the regulatory requirements of the program of the children's and youth sports school for rugby for athletes of this skill level.

A distinctive feature of the training program of the experimental group were specially selected exercises for the development of coordination abilities.

The developed program of preparation of rugby players included such types of motor activity:

1. Cross-country exercises. Running was performed in lines from the front to the front line of the site with 180° and 360° turns when exposed to unexpected signals.

2. Jumping in place. First, during the training, jumps with rotations to the specified side and a certain degree of angle (on 90°, 180°, 360°). Over time, the direction of rotation changed as instructed by the coach, for example: one jump to the right side by 90°, two jumps to 90° to the left, and the fourth jump to 180° to the right. The dosage of the exercises and their shifts varied depending on the degree of their mastery: with a decrease in errors, the number of repetitions and the degree of rotation increased. These exercises contributed to the development of vestibular stability.

3. Exercises using a coordination ladder (Bykova, Druz, Pomeshchikova, Strelnikova, Strelnikov, Melnyk, & Shyriaieva, 2017). Imitated horizontal rope ladder was located on the field field. Through its squares jumps were performed with rotations on one and two legs.

4. Acrobatic exercises: fall over, "wheels", falling with different options. As you mastered the technique of performing these exercises, the dosage was increased and the conditions for performing the exercises became more complicated, the sequence was changed, an additional stimulus was introduced, in which the types of exercises were changed. Acrobatic exercises were performed individually and in pairs.

The degree of effectiveness of the proposed method was evaluated by comparing the parameters of the control and experimental groups before and after the experiment. Indicators of technical preparedness of rugby players of 16-17 years were determined using the tests presented in Table 1.

Table 1. Tests to determine the level of technical preparedness

№ i/o	Name of test	Directivity
1.	Transfer of the ball in pairs for 1 min, number of times	Coordination and speed-strength abilities of the upper limbs
2.	Tackle for 30 s, number of times	Coordination and speed-strength abilities upper and lower limbs
3.	Strike the ball "high ball", m	Coordination of the lower limbs
4.	Catching the ball after a stroke, number of times	Coordination of ability upper limbs
5.	Strike and catch the ball on the move, number of times	Coordination of ability upper and lower limbs
6.	Strike on range with hands, m	Coordination and speed-strength abilities of the lower limbs
7.	"Drop-kick", m	Coordination and speed-strength abilities of the upper and lower limbs
8.	Strike on goal, m	Coordination and speed-strength abilities of the lower limbs

To test the effectiveness of the program presented, the method of the comparative pedagogical experiment was applied. The parameters of the experimental and control groups were compared. The experimental group was trained according to the developed program, and the control group for the standard program. *Statistical analysis* was carried out using licensed Microsoft Excel spreadsheet packages. Indicators of descriptive statistics (mean arithmetic mean, standard deviation and error of average value) were determined. The reliability of differences in the mean values was estimated by the Student's test for $p<0,05$.

The effectiveness of the influence of coordination training on technical preparedness was determined by the level of correlation between them.

Results of the study and their discussion

The proposed sets of exercises were aimed at the development of vestibular stability, which made it possible to maintain working play positions of the body of athletes with significant rotational movements and counteractions of rivals. Of great importance for the development of coordination abilities are exercises that develop responses to an unexpected stimulus - these are the reactions of choice, the accuracy of reproduction of the force and spatial characteristics of motion. All rapid response exercises contributed to the development of such indicators of coordination abilities as latent stress time (LST) and latent relaxation time (LRT). These two indicators directly characterize the coordination process, which is characterized by the concerted stress and relaxation of certain muscle groups. Table 2 presents the dynamics of test indicators of coordination abilities in the control and experimental groups.

Table 2. Indicators of testing the coordination abilities of rugby players of 16-17 years of the control and experimental groups before and after the experiment ($n_1=n_2=15$)

Indicators	Control group	Experimental group	Stat. indicators	
	$\overline{X}$ ±m	$\overline{X}$ ±m	t	p
Before the experiment				
Romberg test, s	33,13±0,64	32,80±0,65	0,36	>0,05
Error reproducing predetermined line length, % mod	12,3±1,1	12,9±1,0	0,44	>0,05
Error estimating the length of segments,% mod	7,9±0,9	7,3±0,9	0,46	>0,05
Error of reproduction of preset force with closed eyes, % mod	14,4±1,9	14,7±0,8	0,15	>0,05
Time of reaction to a moving object, s	0,379±0,57	0,344±0,79	0,04	>0,05
Time of selection response, s	0,488±0,07	0,465±0,60	0,25	>0,05
Time of response to auditory stimulus, s	0,459±0,27	0,424±0,35	0,08	>0,05
Time of response to visual stimulus, s	0,315±0,04	0,295±0,05	0,31	>0,05
Shuttle run (3x10 m), s	9,21±1,73	9,12±1,57	0,04	>0,05
Latent stress time, mls	191,27±1,03	191,00±1,07	0,18	>0,05
Latent relaxation time, mls	197,47±1,19	197,00±1,93	0,20	>0,05
After the experiment				
Romberg test, s	33,39±0,74	36,08±1,05	2,09	<0,05
Error reproducing predetermined line length, % mod	12,0±1,0	7,7±0,1	2,10	<0,05
Error estimating the length of segments, % mod	7,2±0,9	5,2±0,3	2,11	<0,05
Error of reproduction of preset force with closed eyes, % mod	13,4±1,2	10,9±0,5	2,05	<0,05
Time of reaction to a moving object, s	0,354±0,17	0,179±0,09	0,91	>0,05
Time of selection response, s	0,478±0,07	0,311±0,04	2,07	<0,05
Time of response to auditory stimulus, s	0,451±0,07	0,366±0,07	0,86	>0,05
Time of response to visual stimulus, s	0,302±0,05	0,201±0,07	1,17	>0,05
Shuttle run (3x10 m), s	9,10±0,48	7,75±0,43	2,09	<0,05
Latent stress time, mls	184,27±1,01	181,19±1,04	2,08	<0,05
Latent relaxation time, mls	192,13±1,21	188,67±1,13	2,09	<0,05

The indicators of the coordination abilities of the rugby players of the control and experimental groups before the experiment did not have significant differences ($p>0,05$).

After the experiment in the indicators of coordination abilities, when comparing the control and experimental groups, there are significant differences ($p<0,05$) in the following tests: the Romberg test, error reproducing predetermined line length, error estimating the length of segments, error of reproduction of preset force with closed eyes, time of selection response, shuttle run, latent stress time, latent relaxation time.

Comparison of the coordination abilities of the athletes of the experimental group before and after the experiment showed their significant improvement. Thus, the index of balance on one leg with the closed eyes (Romberg sample) improved after the experiment by 10,0% ($p<0,05$), which ensures the preservation of the working posture at the time of the execution of technical elements in the conditions of intense confrontation between rivals. The reaction time to the visual stimulus significantly decreased (31,9%, $p>0,05$), which provides a qualitative assessment of game situations and the ability to rebuild the motor activity of athletes to achieve the necessary success, and an improvement in the response time to the moving object on 48,0% ($p>0,05$). The indicator of the response time to the auditory stimulus was improved by 13,7% ($p>0,05$). The shuttle run improved by 15,0% ($p>0,05$), which significantly increases the maneuverability of players, especially when running with the ball. There is an increase in the accuracy of reproduction of the parameters of motion: power – by 25,8% ($p<0,001$) and spatial (error of reproduction of the specified line length by – 40,3% ($p<0,01$) and error estimating the length of segments – on 28,7% ($p<0,05$).

One of the main mechanisms of motion control are indicators of latent stress time and latent relaxation time, since this property of the central nervous system ensures the expediency and timeliness of motor actions. There is also a statistically significant decrease in latent stress time ($p<0,001$) and latent relaxation time ($p<0,001$). An increase in the response rate to an unexpected stimulus (visual and auditory) contributed to an increase in the response of choice (33,1%), which provides an instant assessment of the situation and the adoption of the right decision. Table 3 shows the results of the test assignments to determine the technical preparedness of the rugby players of the experimental and control groups before and after the experiment. Thus, the indicators of the coordination abilities of the rugby players of the 16-17 years of the control and experimental groups before the experiment did not reveal any significant differences ($p>0,05$).

After four months of the pedagogical experiment, during which the training process of the rugby players of the experimental group was supplemented with specially selected acrobatic exercises and jumping exercises using the coordination ladder, the indicators of the coordination abilities of the athletes of the control and experimental groups. As a result of the analysis, after the experiment presented in Table 3, it was established that between the parameters of the experimental and control groups, there were significant differences in all parameters ($p<0,05$). Consequently, the developed program of coordination training contributed to a significant increase in the level of technical preparedness of rugby players.

In the experimental group, the most significant increases were observed in the rates of impact and catching the ball on the run – 18,6% ($p>0,001$), catching the ball after the strike – 15,8% ($p>0,001$), tackle – 13,3% ($p>0,001$) and the ball hit the goal – 8,9% ($p>0,001$). All other indicators improved from 4,1% to 7,5% ($p<0,05$, $p<0,001$). In the control group, there is a significant improvement in the three indicators: catching the ball after the strike – 12,1% ($p>0,001$), hitting and catching the ball from the turn – 9,6% ($p>0,001$) and hitting the ball "high ball" – 8,6 % ($p>0,001$). All other indicators improved from 1,1% to 6,2% ($p>0,05$, $p<0,05$, $p<0,001$).

Table 3. Indicators of technical preparedness of rugby players of 16-17 years of control and experimental group before and after the experiment ($n_1=n_2=15$)

Indicators	Control group $\overline{X} \pm \sigma$	Experimental group $\overline{X} \pm \sigma$	Stat. indicators t	p
Before the experiment				
Romberg test, s	37,2±0,8	37,3±1,3	0,70	>0,05
Error reproducing predetermined line length, % mod	7,1±0,6	7,0±0,7	0,56	>0,05
Error estimating the length of segments, % mod	22,6±1,3	23,3±1,3	1,39	>0,05
Error of reproduction of preset force with closed eyes, % mod	7,7±0,7	8,0±0,7	1,07	>0,05
Time of reaction to a moving object, s	6,9±0,6	6,8±0,6	0,63	>0,05
Time of selection response, s	36,0±0,9	35,8±0,7	0,67	>0,05
Time of response to auditory stimulus, s	19,0±1,0	19,1±1,2	0,33	>0,05
Time of response to visual stimulus, s	22,7±1,3	22,4±1,4	0,68	>0,05
After the experiment				
Romberg test, s	38,2±0,9	39,0±1,1	2,18	<0,05
Error reproducing predetermined line length, % mod	7,5±0,6	7,9±0,5	2,30	<0,05
Error estimating the length of segments, % mod	24,5±0,6	25,0±0,5	2,17	<0,01
Error of reproduction of preset force with closed eyes, % mod	8,7±0,6	9,3±0,7	2,48	<0,05
Time of reaction to a moving object, s	7,6±0,5	8,1±0,6	2,32	<0,05
Time of selection response, s	37,6±0,6	37,9±0,5	1,65	<0,05
Time of response to auditory stimulus, s	19,2±1,0	20,1±0,7	2,71	<0,05
Time of response to visual stimulus, s	24,1±1,3	24,4±0,7	0,69	<0,05

Confirmation of the obtained results of the study is the correlation analysis, which shows the level of interdependence of the compared indicators. Thus, in Table 4 the correlation of the indicators of coordination abilities and technical readiness of rugby players aged 16-17 at the initial stage of the pedagogical experiment. The analysis of the results revealed only 15 statistical reliable relationships, of which only three had a confidence level of p>0,01: reaction to the moving object and impact and catching the ball from the turn (r=0,54), latent relaxation time and catching the ball after the strike (r=-0,50) and latent relaxation time and tackle from 30 s (r=-0,47).

Table 4. Correlation interrelation of indicators of coordination abilities and technical readiness of rugby players 16-17 years before the experiment (n=30)

Coordination abilities	Technical indicators							
	Transfer of the ball in pairs in 1 min	Tackle for 30 s	Strike the ball "high ball"	Catching the ball after a stroke	Strike and catch the ball on the move	Strike on range with hands к	"Drop-kick"	Strike on goal
Romberg test, s	-0,12	-0,16	-0,12	-0,30	**-0,40**	0,14	-0,19	0,03
Error reproducing predetermined line length, % mod	-0,24	-0,04	-0,24	-0,12	**0,36**	-0,16	0,01	-0,06
Error estimating the length of segments, % mod	**0,40**	0,21	**0,42**	0,29	0,12	0,31	**0,36**	0,15
Error of reproduction of preset force with closed eyes, % mod	**-0,36**	-0,05	0,09	-0,26	-0,08	0,12	-0,10	0,00
Time of reaction to a moving object, s	-0,25	-0,20	-0,25	-0,28	**-0,54**	-0,18	-0,20	0,02
Time of selection response, s	0,09	-0,14	0,06	0,10	-0,15	-0,14	0,05	0,11
Time of response to auditory stimulus, s	-0,30	0,11	-0,30	-0,06	-0,11	**-0,37**	-0,06	0,01
Time of response to visual stimulus, s	-0,30	-0,10	-0,13	**-0,37**	-0,22	-0,03	**-0,40**	0,04
Romberg test, s	-0,12	0,03	-0,22	-0,27	-0,10	-0,28	-0,24	0,02
Error reproducing predetermined line length, % mod	-0,26	-0,02	-0,22	-0,26	**-0,37**	0,06	-0,13	**-0,36**
Error estimating the length of segments, % mod	-0,07	**-0,47**	-0,24	**-0,50**	-0,19	0,09	-0,18	**-0,37**

* at n=30; r_{cr}≥0,36; p<0,05; r_{cr}≥0,46; p<0,01; r_{cr}≥0,57; p<0,001

Correlation analysis after the pedagogical experiment showed (Table 5) that the development of coordination abilities contributed to a significant increase in the level of technical preparedness. 44 reliable relationships between indicators of technical preparedness and coordination abilities.

Thus, the indices of the latent stress time and latent relaxation time have five reliable connections with the indices of technical readiness: the latent time of stress and the transfer of the ball in pairs (r=0,46), the latent stress time and tackle s in 30 s (r=-0,51), the latent time of tension and catching the ball after the strike (r=0,58), latent stress time and impact and catching the ball from the turn (r=0,43), latent stress time and tackle for 30 s (r=0,48), latent time of relaxation and transfer of the ball in pairs (r=0,39), latent time for relaxation and tackle 30 s (r=0,42), latent time of relaxation and catching the ball after the strike (r=0,53), latent relaxation time and hit and catching the ball from the turn (r=0.48), latent relaxation time and "drop kick" (r=-0,43).

Table 5. Correlation interrelation of indicators of coordination abilities and technical readiness of rugby players 16-17 years after the experiment (n=30)

Coordination abilities	Technical indicators							
	Transfer of the ball in pairs in 1 min	Tackle for 30 s	Strike the ball "high ball"	Catching the ball after a stroke	Strike and catch the ball on the move	Strike on range with hands к	"Drop-kick"	Strike on goal
Romberg test, s	**-0,51**	**0,46**	0,29	**-0,38**	-0,21	0,11	-0,26	0,22
Error reproducing predetermined line length, % mod	**0,45**	0,27	-0,14	-0,23	0,33	-0,14	0,27	-0,16
Error estimating the length of segments, % mod	**0,38**	**0,58**	-0,28	**-0,36**	**0,48**	-0,32	**0,37**	**-0,40**
Error of reproduction of preset force with closed eyes, % mod	**-0,61**	**-0,38**	0,33	0,27	**-0,39**	0,24	-0,27	**0,36**
Time of reaction to a moving object, s	**-0,44**	**0,48**	**0,49**	**0,46**	**0,38**	-0,27	0,19	**0,36**
Time of selection response, s	**0,42**	-0,34	0,18	**0,36**	0,32	0,21	-0,24	**0,39**
Time of response to auditory stimulus, s	**-0,56**	**0,48**	-0,27	**-0,47**	**-0,38**	0,26	0,21	-0,25
Time of response to visual stimulus, s	**-0,54**	**-0,62**	-0,22	**-0,46**	**-0,43**	-0,32	-0,28	-0,21
Romberg test, s	**0,45**	**-0,39**	0,14	0,24	0,24	0,11	**0,57**	0,14
Error reproducing predetermined line length, % mod	**0,46**	**-0,51**	-0,17	**0,58**	**-0,43**	0,18	**0,48**	-0,26
Error estimating the length of segments, % mod	**-0,39**	**-0,42**	-0,14	**-0,53**	**0,48**	-0,20	**-0,43**	0,16

* at n=30; r_{cr}≥0,36; p<0,05; r_{cr}≥0,46; p<0,01; r_{cr}≥0,57; p<0,001

In addition, the significant role of individual coordination abilities (reproduction of spatial and force parameters of motion, reaction time to light and visual stimulus, reactions of selection and reaction to a moving object and the index of the shuttle test) has increased significantly to improve technical skills.

Analyzing the results of the correlation relationship, it should be noted that the leading factor in the manifestation of coordination abilities is latent voltage time and latent relaxation time, as the regulatory effect of the cortex of the cerebral hemispheres (Cazzola, Pavei, & Preatoni, 2016; Sogut, 2017).

Discussion

The conducted research of the possibility of development of the coordination abilities of the rugby players of the 16-17 years showed the ways of their improvement, and revealed their natural influence on the improvement of technical preparedness in the process of gaming activity. Referring to the well-known regularities and methods of developing coordination abilities (Platonov, 2015), our study presents special indicators of coordination abilities that are characteristic for this sport.

These provisions testify that the correlation between the process of excitation and inhibition in the central nervous system is the basis of the laws governing the development of coordination capabilities. For example, a study by Zemková Erika (2016) states that in game sports and martial arts, the main factor in the development of coordination abilities is the ability for rapid stress and rapid relaxation, as well as the speed of single movements. Our studies confirm this position, since the improvement of the latent time of tension and relaxation contributed to an improvement in the response to a moving object, the response of choice.

A study by Daniel V. Chagas, John Ozmun, & Luiz Alberto Batista (2017) shows that when mastering the technique of playing volleyball, coordination skills are of paramount importance, this is confirmed by our data. It was found that the increase in vestibular stability significantly increased such parameters as seizures in 30 seconds, transfer of the ball in pairs, impact and catching ball from the course and others. Confirmation of the relationship between coordination abilities and movement technique is observed in the studies of Zimmerman, K. (1988), Boichuk Roman, Iermakov Sergii, Nosko Mykola, Kovtsun Vasyl, & Nosko Yuliya (2017) and Baginska O.V. (2017). It is shown that athletes with high coordination abilities improved the results of gaming activity up to 40,0%.

At the same time, many authors assert that the level of coordination abilities will positively influence if their development will take place in conditions as close as possible to competitive (Gierczuk, & Sadowski, 2015; Cazzola, Pavei, & Preatoni, 2016).

Assessing the level of preparedness of athletes, the authors testify that in the process of long-term preparation the individual level of abilities decreases, and the coordination complexity of motor actions increases (Cazzola, Pavei, & Preatoni, 2016; Druz, Iermakov, Nosko, Shesterova, & Novitskaya, 2017).

Studies Bolotin A. & Bakayev V. (2018) showed that training for new different motor actions should take place with a gradual increase in the complexity of their coordination. It was found that with the assimilation of new motor activities, not only new skills are formed, but also the ability to new forms of coordination of movements develops. This approach to the development of coordination abilities passes through three stages. At the first stage, coordinated links between different systems of the body are formed. At the second stage, new actions are developed on the basis of increasing coordination abilities. At the third stage, coordination capabilities are improving in the context of competitive activities.

The Taskin Cengiz & Bicer Yonca Sureyya (2015) study presents an eight-week program for developing coordination abilities using a special tilting platform that tilts along a special signal in different directions, and rotates clockwise and counterclockwise. The eight-week program contributed to an increase in vestibular stability, as well as the response of choice to the moving object.

Our studies as a whole confirm the results of the study of the authors cited, which are based on general physiological patterns of adaptation of the human body to physical loads and on the basis of which coordination abilities develop. However, it is always necessary to take into account the specifics of competitive activity, so that coordination opportunities contribute to a clear manifestation of specific motor actions.

In the formation of complex co-ordinated actions, the conditions for performing exercises should be brought closer to the competitive.

Conclusions

The results of the research confirm the necessity of development of coordination abilities as a basis for controlling the technique of motor actions, which ensures the manifestation of motor qualities during the competitive activity.

In the process of formation of coordination actions, it is necessary to gradually complicate their structure and to approximate the conditions for performing motor actions to competitive.

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