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Features of improving the special strength training of highly qualified handball players in sports training

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Abstract

Purpose: The paper presents the program of special strength training of highly qualified handball players developed by us. The experimental data obtained in the work confirm the effectiveness of its use in the educational and training process.

Methods: analysis of educational and methodological literature, pedagogical testing, pedagogical observation, pedagogical experiment, methods of mathematical statistics.

Results: The program of special strength training of highly qualified handball players developed by us, after being introduced into the training process, has shown its effectiveness mainly in the development of speed and strength qualities of athletes, as well as explosive strength and reactive ability of the extensor muscles of the upper and lower extremities, the training tools used on the basis of basic plyometric exercises and timely monitoring of the process of improving sports training have proven their effectiveness and are recommended both for working with national teams and for preparing the nearest sports reserve.

Conclusion: The program developed and implemented in the training process for the development of special strength abilities in highly qualified handball players has the task of developing explosive strength and reactive ability of the extensor muscles of the arms and legs, which are important during the game. The developed program is based on basic plyometric exercises, which should be strictly adhered to according to the developed method of load dosing in order to effectively develop special strength abilities in highly qualified handball players.

Keywords: Plyometric exercises, explosive force, reactivity, extensor muscles, educational and training process.

Introduction

Consistent measures are being taken in our republic to popularize physical culture and sports, promote a healthy lifestyle among the population, create the necessary conditions to ensure a decent performance of the country in the international sports arena.

At the same time, there is a need to put into practice specific programs in the field of physical culture and sports that contribute to optimizing the construction of the training process of national teams of high-class athletes aimed at achieving high results in various sports.

The regulatory legal acts of the Republic of Uzbekistan are a solid basis for the further development of the sphere of physical culture and sports: The Law of the Republic of Uzbekistan, dated 04.09.2015 Law of Republic of Uzbekistan №-394 "On Physical Culture and Sports", Decree of the President of the Republic of Uzbekistan dated March 5, 2018 №. PD-5368 "On measures to radically improve the system of public administration in the field of physical culture and sports", as well as other regulatory documents in this area.

In recent years, major changes have taken place in the development of world handball, of which the most significant are: an increase in the pace of the game itself, a significant increase in the number of technical actions performed, an increase in physical exertion on the athletes' body (Zhosan et al., 2014; Goncharova et al., 2021). All this causes the need to search for and improve the means and methods of training highly qualified handball players. In all likelihood, based on the above, our opinion agrees with leading experts that speed and strength training requires focused attention as it is a basic factor in the success of the training process and competitive activity (Zhosan et al., 2014; Platonov, 2004; Shustina, 2021). At the same time, it should be noted that at the moment it is the issues concerning the speed and strength training of athletes of various sports, including handball players, that are a flaw in the methodical approach of the training system (Goncharova, 2020; Kerimov et al., 2021; Goncharova, 2019).

Methods

In the course of scientific research, we used such methods as: pedagogical observation of

the process of training highly qualified handball players, observation of competitive activity, pedagogical testing of conditioned qualities, analysis of the training process and competitive activity, processing of the results obtained by methods of mathematical statistics. Pedagogical observations were organized over the training process and competitive activities of handball players of the teams "CC AGMK" (Almalyk) and "Tashkent" (Tashkent).

Results and discussion

During the study, 28 highly qualified handball players were examined, the groups were divided into experimental (n=14) and control (n=14), the quantitative composition of the players is equal. After testing, the control group trained in the same mode according to the traditional plan of the training process, in the experimental group we used new approaches based on the program we developed. The training program developed by us provides 12 weeks of preparation. In our program, several types of basic exercises are used, such as: squats with a barbell, jumping out with a barbell, a deep jump, jumping on an elevation, lifting a barbell on the chest, a barbell press. Also, the peculiarity of our program is the content of special plyometric exercises for both the muscles of the upper and lower extremities, with the purposeful development of explosive strength and reactive ability of the extensor muscles of the arms and legs (Goncharova, 2019).

As a result of the statistical analysis, it was revealed that at the beginning of the pedagogical experiment, the studied groups of highly qualified handball players did not have significant statistical differences ($p>0.05$) between the studied parameters. As a result, according to the results of the pedagogical experiment, small changes occurred in the control group, but no significant statistical differences in the studied indicators were revealed ($p>0.05$), and the training program developed by us, designed for highly qualified handball players of the experimental group, confirmed its effectiveness over the traditional system of conducting handball training sessions among high-class athletes (see table 1). The analysis of the results of the data obtained by the handball players of the experimental group is presented in the table.

Table 1. Analysis of testing results of highly qualified handball players.

№	Test		Beginning of the experiment		End of the experiment		t	p
			$\overline{X} \pm \sigma$	V %	$\overline{X} \pm \sigma$	V %		
1.	Running for 30 meters (sec)		4.94±0.35	7.09	4.32±0.44	10.19	3.49	<0.01
2.	Triple jump from a place (cm)		783.8±55.4	7.07	886.9±61.2	6.90	3.95	<0.001
3.	Throwing a stuffed ball weighing 1 kg (m)	With right hand	31.48±2.53	8.04	36.82±2.69	7.31	4.57	<0,001
		With left hand	16.02±1.24	7.74	18.06±1.34	7.42	3.53	<0,01
		With two hands over the head	18.93±1.89	9.98	20.8±1.89	9.09	2.21	<0,05
		With two hands from behind the head	7.69±0.91	11.83	8.83±1.04	11.78	2.61	<0,05
4.	Outline of sports cones 30 meters (sec)	With right hand	7.43±0.54	7.27	6.46±0.62	9.60	3.73	<0,01
		With left hand	7.42±0.55	7.41	6.85±0.58	8.47	2.26	<0,05
5.	Throwing a handball ball at a distance (m)		43.57±3.06	7.02	49.73±3.68	7.40	4.07	<0.001

The analysis of the results indicates the effectiveness of the developed program, which is confirmed by the comparative results of the initial data and at the end of the pedagogical experiment: in the 30 m run, there was a significant improvement in the result from 4.94±0.35 seconds to 4.32±0.44 seconds ($t=3.49$; $p<0.01$); in the triple jump, the result improved from 783.8±55.4 cm to 886.9±61.2 cm ($t=3.95$; $p<0.001$); in throwing a stuffed ball weighing 1

kg with the right hand from 31.48±2.53 m to 36.82±2.69 m (t=4.57; p<0.001); in throwing a stuffed ball weighing 1 kg with the left hand from 16.02±1.24 m to 18.06±1.34 cm (t=3.53; p<0.01); in throwing a stuffed ball weighing 1 kg with two hands over the head from 18.93±1.89 m to 20.8±1.89 m (t= 2.21; p<0.05); in throwing a stuffed ball weighing 1 kg with two hands behind the head from 7.69±0.91 m to 8.83±1.04 m (t=2.61; p<0.05); outline of sports cones 30 meters with the right hand, from 7.43±0.54 seconds up to 6.46±0.62 sec. (t=3.73; p<0.01); outline of sports cones 30 meters with the left hand from 7.42±0.55 seconds up to 6.85±0.58 seconds (t=2.26; p<0.05); in handball ball throws at a range from 43.57±3.06 m to 49.73±3.68 m (t=4.07; p<0.001). Analysis of the results of the control group revealed no significant statistical differences. According to the results obtained at the beginning and at the end of the pedagogical experiment, the control group showed a positive dynamics of the growth of speed and strength indicators, but within unreliable statistical limits (p<0.05).

The developed method of using special strength training with the purposeful development of speed and strength abilities contains plyometric exercises and is also aimed at the development of explosive strength and reactive ability of the extensor muscles of the arms and legs, built on the principle of gradually increasing specificity and intensity of the load. In general, the results of the conducted studies confirmed the effectiveness of the developed program, thereby an increase in the maximum leg strength in squats by 13.7% was recorded, which in turn allowed to increase the weight in jumping with a barbell on the shoulders of athletes, as well as in lifting on the chest, which was about 40% of the maximum in squats with a barbell. The work done made it possible to implement the tasks set and confirm the effectiveness of the developed program in the training process of highly qualified handball players.

Conclusion

Thus, it can be stated that the program of special strength training of highly qualified handball players developed by us is effective and its use in the training process contributes to a significant increase in the speed and strength training of athletes, which also significantly improves the overall level of physical fitness, which in turn has a positive effect on the results of special physical training and technical and tactical actions of athletes. The positive results were confirmed by a correct pedagogical experiment, which proved its effectiveness for the development of speed and strength qualities, as well as explosive strength and reactivity of the extensor muscles of the upper and lower extremities.

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