

# CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 04 Issue: 12 | Dec 2023 ISSN: 2660-5317  
<https://cajotas.centralasianstudies.org>

## The Dynamics of Changes in Special Physical Fitness Indicators in Handball Students During the Experiment

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*Received 4<sup>th</sup> Oct 2023, Accepted 6<sup>th</sup> Nov 2023, Online 15<sup>th</sup> Dec 2023*

**Abstract:** *In this scientific article, with the help of tests, the specific physical fitness of handball students is assessed. Based on the analysis of the obtained results, practical recommendations are given for improving special physical fitness. The results are studied on the basis of tables and diagrams.*

**Keywords:** *dynamic balance, physical training, handball players, coordination abilities.*

The ability to maintain game performance during multi-cycle, long-term and intense competitive matches in modern handball, especially the ability to stabilize the accuracy of shooting at the goal, depends to some extent on the physical potential of the players.

Proportionate development of physical qualities not only makes it possible to maintain the effectiveness of shooting the ball at the goal, but also promotes the effective formation of the dynamic balance that ensures this effectiveness, the accuracy of distinguishing the necessary time-interval and voltage limit. That is why it is important to take into account the features noted in the selection and application of exercises that train physical qualities in training [6,7].

A number of leading experts-scientists say that the ability to maintain the technical and tactical skills formed during long-term intensive training and competition cycles, coordination of movements and stabilization of its accuracy depends on the formation of almost all physical qualities in a proportional principle depending on the specific characteristics of the chosen sport [L. P. Matveev; V.N. Platonov; V.M. Zatsiorsky; M.A. Godik; Yu.V. Verkhoshansky; J.K. Kholodov, V.S. Kuznetsov]. These scientists also recognize that the source that activates all physical qualities (strength, quickness, agility or coordination ability, endurance, flexibility) and allows them to concentrate their energy reserve is the potential of functional training. However, in order to efficiently use this functional potential or energy reserve during loading, technical-tactical actions should be formed at a high and stable level. Otherwise, symptoms of exhaustion increase, work ability decreases, movement coordination is disturbed, and their accuracy decreases [1,2,3,4,5,9,11].

A number of authors have stated that action precision can have a different appearance with its content and purpose. Including the accuracy of performance of time, distance and force indicators of movement, accuracy of differentiation, accuracy of evaluation and measurement, accurate reaction to a moving object, accuracy of targeting (target) or sniping (aiming). According to them, these abilities can be manifested in some cases in an integral relationship with each other. However, there is also a reason that

they can be implemented as an independent quality representing different aspects of coordination ability [8,10,11].

The purpose of this study: change of special physical fitness indicators in handball-students during the experiment.

Conducting the research work: members of the handball team of the Faculty of Physical Education of Karakalpok State University named after Berdak were involved as examinees.

We studied the above-mentioned problems on the basis of research conducted during 7 months of pedagogical experience on the example of handball players studying at the Faculty of Physical Education of Karakalpok State University named after Berdak. Control (NG) and experimental (TG) groups of 14 handball students were involved in the experiment (Table 1).

The obtained results and their analysis: the role of pedagogical observations is invaluable in the development of the physical and technical-tactical movements of handball players in the correct and effective organization of training processes in increasing the level of physical fitness of handball players.

It is important to pay attention to the development of specific training in each training session in order to improve the physical fitness of handball players, to achieve high-level performance in competitions.

**Table 1. Dynamics of changes in special physical fitness indicators during the experiment in handball students belonging to the control (n=14) and experimental (n=14) groups ( $\bar{X} \pm \sigma$ )**

Reaction types	Group	Before the experiment			After the experiment			Growth rate		t	p
		$\bar{X}$	$\sigma$	V	$\bar{X}$	$\sigma$	V	absolute	relative		
30 m. run to (s.)	HI	5,74	0,55	9,58	5,39	0,51	9,46	-0,35	6,10	1,75	>0,05
	TI	5,96	0,59	9,90	5,22	0,48	9,20	-0,74	12,42	3,64	<0,01
Three folds (cm.)	HI	567,74	63,88	11,25	519,26	57,66	11,10	-48,48	8,54	2,11	<0,05
	TI	563,83	67,14	11,91	661,89	72,08	11,41	53,06	21,08	4,47	<0,01
1 kg. throw the ball behind the head (m.): - in the right hand	HI	19,44	2,04	10,49	20,82	2,16	10,37	1,38	7,10	1,74	>0,05
	TI	19,58	2,18	10,97	23,02	2,36	10,25	3,14	15,79	3,66	<0,01
- in the left hand	HI	18,46	2,28	12,35	19,75	2,39	11,96	1,33	8,29	1,73	>0,05
	TI	18,91	2,36	12,89	22,79	2,67	12,25	3,81	19,01	3,65	<0,01
- two arms in a sitting position	HI	8,13	1,09	13,41	8,88	1,18	13,29	0,75	9,23	1,75	>0,05
	TI	8,34	1,16	13,91	10,06	1,32	13,12	1,72	20,62	3,66	<0,01
30 m. to hit the ball between obstacles and run (s.): - in the right hand	HI	7,78	0,89	11,44	7,22	0,81	11,22	-0,56	7,20	1,74	<0,05
	TI	7,63	0,91	11,93	6,24	0,71	11,38	-1,39	18,22	4,51	<0,01
- in the left hand	HI	8,49	1,05	12,37	7,97	0,95	12,15	-0,67	7,89	1,77	<0,05
	TI	8,17	1,07	12,78	6,73	0,86	12,23	-1,64	16,01	3,65	<0,01

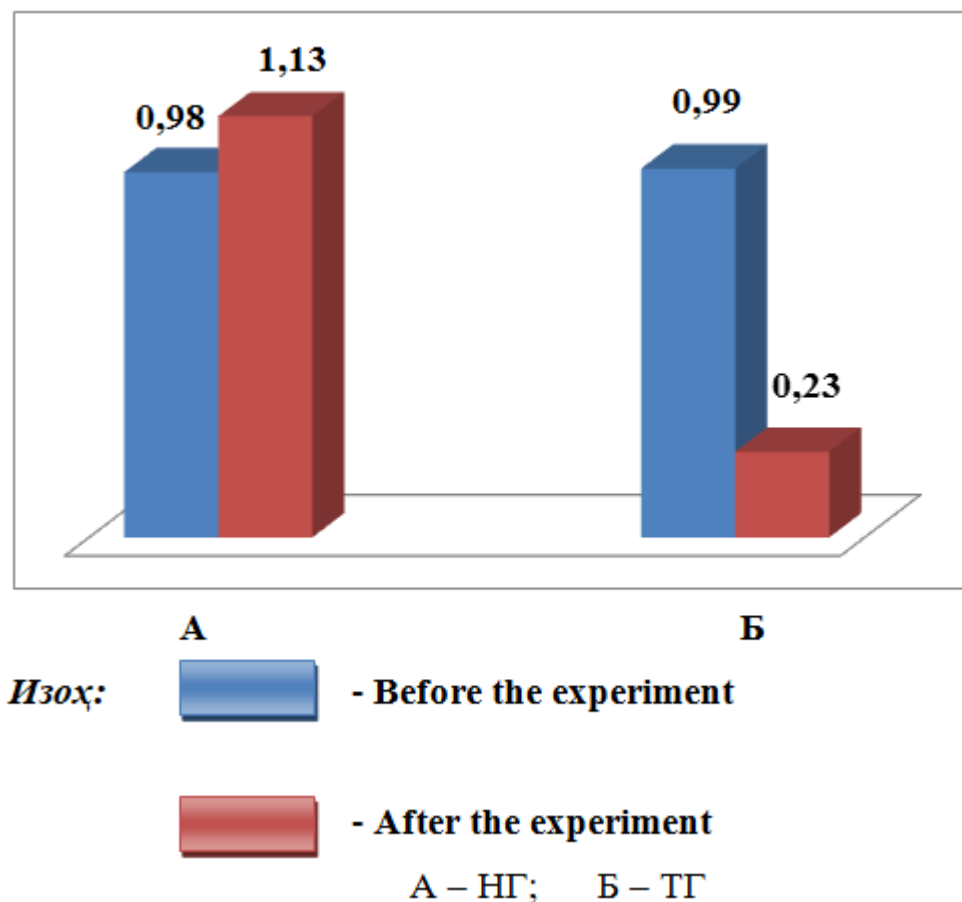
The average increase in the control group was 7.80%.

The average increase in the experimental group is 17.18%.

It is worth noting that the recorded indicators were not only inferior to the requirements of the normative criteria adopted in Russia, but it turned out that there was a noticeable asymmetric difference between the range of balls shot with the right and left hands in NG (Fig. 1). As can be seen from the diagrams shown in this picture, such asymmetric difference was also noted in TG before the experiment (0.99 m), but by the end of the experiment, this asymmetric difference was 0.23 m. symmetrized up to So, it can be said that it is appropriate to pay serious attention to the symmetrical development of right and left hand movement types in training with highly qualified handball-students.

In handball competitions, there are also situations when the opponent passes the ball to his partner who is in a comfortable position or is moving further away, with both hands. Therefore, in handball, exercises for throwing the ball behind the head with both hands from different positions (sitting position, jumping position, etc.) are used.

Figure 1. Indicators of change of the asymmetric difference between the interval of throwing the filler ball with the right and left hand to the maximum distance in the handball students belonging to the control and experimental groups, before the experiment, until the end of the experiment.



**CONCLUSION.** Studies have shown that 1 kg. The maximum range of throwing the ball behind the head with two hands in a sitting position is  $8.13 \pm 1.09$  m before the experiment in NG. ni,  $8.88 \pm 1.18$  m after the experiment. ( $r > 0.05$ ). The rate of growth of the distance of throwing the ball is 0.75 m. represented by (9.23%). In TG, these indicators are  $8.34 \pm 1.16$  m. from  $10.06 \pm 1.32$  m. ( $r < 0.01$ ) or its growth rate is 1.72 m. was (20.62%). According to regulatory requirements, these indicators are 11.0-14.0 m. is determined

to be Therefore, it can be said that the indicator recorded at the end of the experiment in TG approached the minimum level of this standard.

30 m. The speed of hitting the ball between the obstacles with the right hand was  $7.78 \pm 0.89$  s before the experiment in NG. was  $7.22 \pm 0.81$  s after the experiment. expressed by ( $r < 0.05$ ) or the rate of increase of speed is 0.56 s. was (7.2%). The speed of hitting the ball between obstacles with the left hand in this group (NG) was  $8.49 \pm 1.05$  s before the experiment, and  $7.82 \pm 0.95$  s after the experiment. was found to be represented by ( $r < 0.05$ ). The rate of increase in speed is 0.67 s. was (7.89%).

It can be seen that the range of throwing the ball with the right and left hands and from a sitting position with two hands to the maximum distance increased to 15.79%, 18.97% and 20.62%, respectively, at the end of the experiment. However, in NG, who continued to engage in traditional training during the experiment, these indicators were 7.10%, 8.60% and 9.23% (Figure 4.2).

0.71 s in NG before experiment between right and left handed batting speed. It was found that there is an asymmetric difference equal to , and after the experiment this difference is 0.75 s. increased to Such asymmetric difference in TG is initially 0.74 s. expressed by , after the experiment this asymmetric difference is 0.43 s. symmetrized up to

Based on the comparative analysis of the research results mentioned above, it can be noted that, firstly, the indicators of special physical training obtained before the experiment in both groups were lower than the level of normative indicators recommended by foreign experts. Secondly, it was observed that the indicators obtained before the experiment remained almost unchanged or increased very slowly in NG at the end of the experiment. In TG, these indicators approached international standards by the end of the experiment.

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