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Dynamics of Formation of Growth Results of Functional Components of Special Working Ability in Control and Experimental Groups Of 15-16-Year-Old Volleyball Players During the Experimental Period

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Abstract: The article presents the results of a study of the dynamics of growth of functional components of special indicators in 15-16-year-old volleyball players. The purpose of the study was to determine the effectiveness of a specially developed training method aimed at developing functional endurance, coordination and strength. The study was conducted for 12 months with the participation of 60 athletes divided into control and experimental groups. Analysis of the results showed a significant improvement in the performance of athletes in the experimental group compared to the control group. Quantitative data confirming the effectiveness of the developed program are presented.

Keywords: Volleyball, special performance, young athletes, functional components, physical training, endurance.

Introduction: In recent years, it has become a tradition to attract young and teenage players (from 15-16 years old) with high physical and technical-tactical training to professional volleyball sections. In most cases, such problems arise that children involved in professional volleyball, although talented and possessing high skills, cannot withstand intense loads due to insufficient physical and functional readiness, as a result of which both talent and skill are tested. Therefore, it is advisable to study such problems in annual training cycles using current research and eliminate them based on the results obtained.

METHOD

According to the conclusions of leading experts and scientists who have conducted many fundamental studies on the theory and methodology of sports training and created scientific and theoretical concepts and methodological laws within the framework of training highly qualified, competitive athletes, achieving high results in sports practice can be achieved by using types of training (physical, technical-tactical, psychofunctional) in a proportional order, in an integrated direction, increasing the volume and intensity of loads in accordance with the possibilities, and taking measures to restore and strengthen working capacity in a timely manner. [1,2,3,4,5,6,7,8,9,10,11,12,13,14].

These authors argue that failure to comply with the above-mentioned methodological laws, procedures and principles is likely to “destroy” existing technical skills. Therefore, even if technical and tactical methods are improved with the help of appropriate exercise sets, if their effectiveness or indicators (accuracy, number of repetitions, speed, etc.) fall below model indicators and normative requirements for a certain period of time, then it is possible to assume that the traditional training or appropriate exercise sets used do not have sufficient impact value.

RESULTS AND DISCUSSION

According to our physiologists (Khalilov E.Kh., Zaynabiddinov A.E., Khushmatov Sh.S. 2020. -330.), hereditary factors affect the level of development of physical qualities. Due to the strong influence of heredity on the body's agility, flexibility, speed-strength qualities, they develop slowly. Some physiological indicators, including maximum oxygen consumption, anaerobic capacity, maximum heart rate, increased lung capacity, etc., depend on heredity [15].

Table 1

Dynamics of formation of functional components of special work ability in control and experimental groups of 15-16 year old volleyball players during 12 months of pedagogical experience, ($X \pm \sigma$)

№	Tests	Group	Before the experiment, July 2024.	After the experiment, June, 2025.	Difference in indicators	t_{st}	P
1	Frequency (**Heart rate**), (times/min.)	TG	69±0,74	66,8±0.33	-2,2	2,59	<0,05
		NG	68,5±0,97	67±0,70	-1,5	1,31	<0,05
2	SBP: systolic pressure, (mm/s.u.)	TG	125,6±0,76	123,4±0,70	-2,2	2,61	<0,05
		NG	125,8±0,65	124,4±0,79	-1,4	1,36	>0,05
3	Diastolic pressure, (mm./s.u.)	TG	68,3±0,78	66,1±0,71	-2,2	2,47	<0,05
		NG	68,6±1,49	67,1±1,19	-1,5	0,80	>0,05
4	NOCh, (times/min.)	TG	14,3±0,52	12,1±0,56	-2,2	3,21	<0,01
		NG	14,3±0,68	12,9±0,51	-1,4	1,61	>0,05
5	Barbell test – take a deep breath and hold your breath, (sec.)	TG	37,7±1,08	42,8±1,21	+5,1	3,38	<0,001
		NG	37,1±1,35	38,8±1,45	1,7	0,86	>0,05
6	Genchi test – deep breath in and hold your breath, (sec.)	TG	24,1±1,53	27,9±1,20	+3,8	2,10	<0,001
		NG	24,2±1,66	25,8±1,59	+1,6	0,70	>0,05

1. Heart rate (beats/min): experimental group (tg): the rate of high short-term speed performance decreased from 69 to 66.8 beats/min (-2.2 beats/min, p<0.05). This probably reflects changes in the intensity and pattern of training, aimed at optimizing the body's energy expenditure. Control group (ng): this indicator decreased from 68.5 to 67 beats/min (-1.5 beats/min, p<0.05), a statistically significant decrease was also observed in this group, but the degree of decrease was not as great as in the experimental group.

2. Systolic pressure (mm/s.u.): Experimental group (TG): Systolic pressure decreased from 125.6 mm/s.u. to 123.4 mm/s.u. (-2.2 mm/s.u., p<0.05). This change may be related to blood pressure regulation and the body's adaptation to intense physical exercise. Control group (CG): In this group, systolic pressure decreased from 125.8 mm/s.u. to 124.4 mm/s.u. (-1.4 mm/s.u., p>0.05), this change is not statistically significant.

3. Diastolic pressure (mm/s.u.): Experimental group (TG): Diastolic pressure decreased from 68.3 mm/s.u. to 66.1 mm/s.u. decreased to (-2.2 mm/s.u., p<0.05). This result indicates an improvement in the general condition of the body and a decrease in vascular resistance. Control group (NG): Diastolic pressure decreased from 68.6 mm/s.u. to 67.1 mm/s.u. (-1.5 mm/s.u., p>0.05), this change is not statistically significant.

4. Respiratory rate (noch) (times/min.): experimental group (tg): respiratory rate decreased from 14.3 times to 12.1 times (-2.2 times/min., p<0.01). This result indicates the efficiency of breathing and aerobic adaptation of muscles. control group (ng): respiratory rate decreased from 14.3 to 12.9 times (-1.4 times/min., p>0.05), these changes were observed to be statistically insignificant.

5. Barbell test – deep breath and breath hold (sec.): experimental group (tg): the accumulated breath hold time in the barbell test increased from 37.7 sec. to 42.8 sec. (+5.1 sec., p<0.001). This change indicates an improvement in muscle endurance and respiratory control. control group (ng): this indicator increased from 37.1 sec. to 38.8 sec. (+1.7 sec., p>0.05), but this result is much smaller than in the experimental group and is not statistically significant.

6. Genchi test – deep breath and breath hold (sec.): experimental group (tg): breath hold time in the Genchi test increased from 24.1 sec. to 27.9 sec. (+3.8 sec., p<0.001). This indicates a significant improvement in respiratory capacity and physical endurance. control group (ng): this indicator increased from 24.2 sec. to 25.8 sec. (+1.6 sec., p>0.05), but this change is very small and not statistically significant.

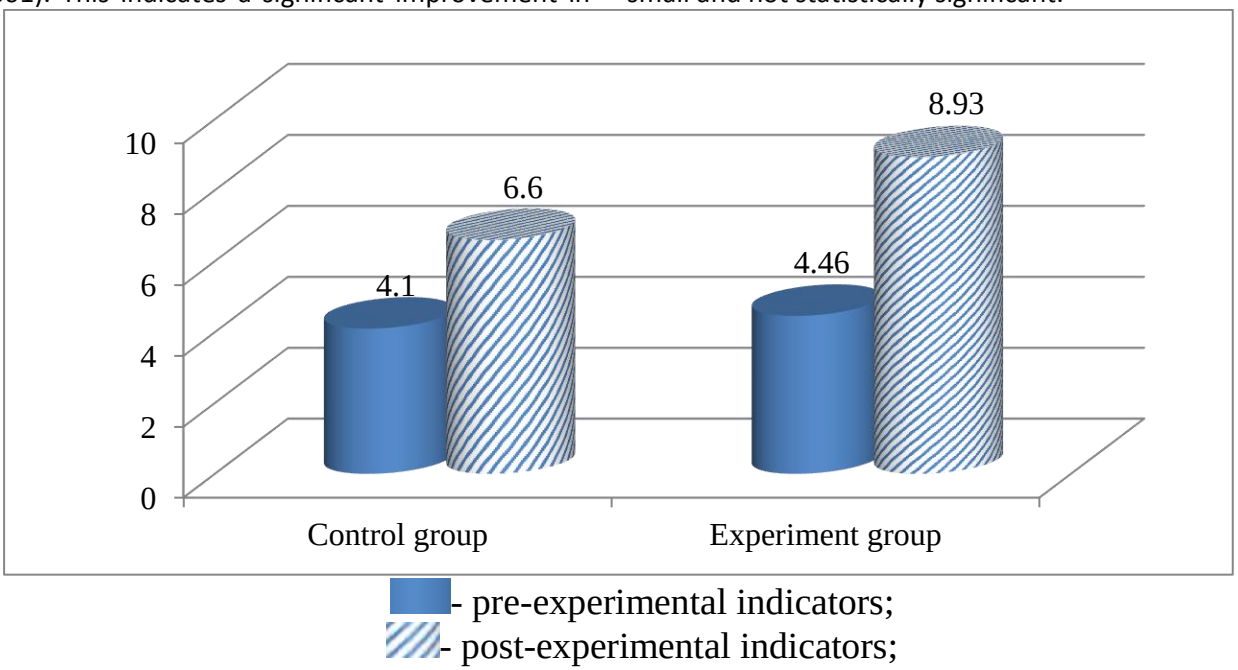

Diagram 1. Change in the asymmetric difference between the number of throw-ins (9 times in total) in the zones 1, 6, 5 (a circle is drawn every 2 meters, the center of the maximum circle is taken as the target) before and after the experiment in the control and experimental groups.

The above results show that the athletes in the experimental group showed significant positive changes in physical and physiological indicators after training. For example, high short-term speed and respiratory indicators improved significantly, and positive changes were also observed in systolic and diastolic pressure. This indicates the effectiveness of the training of the experimental group. Although there were changes in the control group, they were not statistically significant, which indicates that the changes in the experimental group were at a much higher level.

According to the author, physical exercises or sports training that are standardized and applied based on a clearly developed methodology, depending on the capabilities and conditions of the participants, have been shown to lead to stability in the norm and growth in sports. On the contrary, the study showed that the application of unproven load norms and exercises that do not take into account the requirements of the norm, the functional and physical conditions of the athlete, and the risk of unnecessary risks for the sake of the result, can lead to athletes who have not yet fully developed to a state of maximum development, to a cold from sports, and to an early farewell to sports.

CONCLUSION

The conducted studies have shown that the above results indicate that the athletes in the experimental group showed significant positive changes in physical and physiological indicators after training. For example, high short-term speed and respiratory indicators improved significantly, and positive changes were also observed in systolic and diastolic pressure. This indicates the effectiveness of the training of the experimental group. Although there were changes in the control group, they were not statistically significant, which indicates that the changes in the experimental group were at a much higher level.

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