

NATIONAL SPORTS ACADEMY “VASSIL LEVSKI”
DEPARTMENT OF “BASKETBALL, VOLLEYBALL, HANDBALL”



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MODERN ASPECTS IN THE EDUCATION AND TRAINING
OF YOUNG VOLLEYBALL PLAYERS

ABSTRACT

of a dissertation for the award of the educational and scientific degree "Doctor" in the professional field 7.6. Sports, doctoral program "Theory and Methodology of Sports Science"

SCIENTIFIC SUPERVISOR:

ASSOC. PROF. GEORGI BOZHILOV, PhD

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The dissertation contains 177 standard pages. It is illustrated with 11 tables, 80 figures and a list of used literature. The bibliography contains 98 sources, of which 81 in Cyrillic, 14 in Latin and 3 Internet sources.

The numbering of the tables and figures in the abstract coincides with that of the dissertation.

The dissertation was discussed and directed for public defense before a scientific jury at an extended meeting of the Department of "Basketball, Volleyball, Handball" at the National Sports Academy "Vasil Levski", held on 10.03.2026.

The public defense of the dissertation for the award of the educational and scientific degree "doctor" will take place on 09.06.2026. at 14:00 in Hall A-3 of the National Sports Academy "Vasil Levski", Studentski grad, Sofia.

INTRODUCTION

Volleyball is one of the most popular and widely practiced sports in the world. It is characterized by a variety of motor skills and game actions, which are distinguished by both intensity and coordination structure. To practice it, a net and two net posts are required to hold it. Nowadays, the variety of types of volleyball is great and it can be practiced outdoors, indoors, on sand, snow, grass, and even in a water environment.

The advantages of the game of volleyball lie not only in the easy equipment of the playing areas, the relatively easy formation of teams of equal strength and age, but also in its rich content - beauty, variety of technical performances, an abundance of complex motor actions requiring high coordination, flexibility, speed, strength and endurance. Since volleyball appeared, it has been developing, popularizing and changing at an intensive pace, and today it is a favorite game of millions of people around the world. Its high level of development, as a type of sport, makes it one of the most effective means for all-round development.

Properly organized volleyball activities have a positive impact on the body, improving cardiorespiratory and motor functions, resistance forces, as well as the immune system. The requirements of the game for those involved do not exceed the requirements of many other physical exercises and sports and thus help to improve and perfect the main functional systems. This is why the volleyball lesson occupies a major part in the physical education system.

Engaged daily in school, and then with private lessons, where the static position of the body is an invariable part of the nature of the activity, children and their parents do not realize the large-scale problem that this staticity creates. It is physical

activity and sports that come to the rescue in today's fast-paced world of technology and easy accessibility to everything and at any time. The importance of motor activity and its systematic presence in the child's daily life is of fundamental importance. It is necessary to reach and change the way of thinking of the modern parent in order to realize that sports and volleyball in particular can build very important skills and habits - from primary to upper school age.

Volleyball is characterized by great emotionality, develops the individual in many ways, placing high demands on his physical, psychological and intellectual potential. It is fast, captivating, and the action in it is explosive. (Gigov, D. 1984). We can rightly say that this is the most successful team sport in Bulgaria. In its over 90-year history, the representatives of volleyball in our country have repeatedly given us reason to be proud. All the successes achieved over the years are related to the mass practice of the game by adolescents, as well as to the establishment of an effective system for the development of this sport.

I.PROBLEM STATEMENT

The success of volleyball players largely depends on the achieved level of technical mastery. Therefore, the requirements for the process of optimizing technical training are one of the most important problems of modern volleyball. The improvement of technical skills in young athletes requires consistency, resourcefulness and good organization of the training process on the part of the coach. Without observing the principles of training, it is impossible to achieve optimal solutions to the problems facing the sports teacher, who is expected to reach every detail in technical training and the improvement of basic techniques in primary and secondary school age. When talking about adolescent volleyball players, it is extremely important to observe the basic didactic principles of training:

- From general to special technique: building a correct stance, working on the feet, positioning in relation to the ball, kinetic chain from lower to upper limbs
- From slow to fast: mastering the form of movement at low speed, then adding tempo, reaction and game stress.
- From simple to complex: isolated exercises → related elements → game scenarios and tactical tasks.
- From individual to group – with good mastery of the technique, more and more competitors should be included in the given exercise.

Modern volleyball is characterized by increasing intensity and dynamics of the game, placing high demands on the physical preparation of the competitors. Excellent coordination, speed, agility and athleticism are required - qualities imposed by the continuous and rapid movement of the ball. It is these features that turn volleyball into a spectacular sport that impresses the audience with the mastery and technical skills of the players.

Like all sports, volleyball undergoes a natural development and positive changes in all components of the game. Along with the improvement of technical elements, the introduction of active blocking and a powerful initial shot with a rebound, all world specialists emphasize increasing the impact force, reducing the attack time and optimizing the high double and triple block - requirements that imply an excellent level of physical preparation.

A key priority in the coach's work with young volleyball players is the development of a stable and broad technical base, on which tactical skills and specialization in positions can later be built. Technique in this context is a system of specific motor actions and habits that allow effective and reliable participation in the game process. Each technical element is a structured sequence of movements performed with a specific goal and in certain situations on the court and consists of several phases characterized by relative stability and stability:

- Waiting for the ball
- Moving and choosing a place
- Working moment
- Readiness for next action (P.Dimitrova, 2007)

Sports technique in sports games, such as volleyball, is necessary to ensure high efficiency, stability and variability in the athlete's actions in the constantly changing conditions of competitive struggle. The process of technical training in these sports should be built entirely with a variable content of technical actions. At the same time, the development of technical and tactical options should be enriched with constant changes in conditions as a result of the actions of the opposing team or player. (Tsv. Zhelyazkov, 2011).

Modern volleyball is characterized by high intensity of game actions, frequent change of situations and significant requirements for the specific working capacity of the players. In adolescence, the processes of mastering and stabilizing volleyball technique occur in conditions of incomplete physical and functional development, which makes the connection between physical and conditioning training and technical mastery particularly significant. Insufficiently developed physical qualities and specific endurance can lead to impaired coordination, decreased accuracy and instability in the performance of technical elements, especially in conditions of fatigue. Therefore, the study of the influence of the level of physical and conditioning training on the mastery and improvement of volleyball technique in adolescent athletes is a scientifically justified necessity, which logically leads to the formulation of the present working hypothesis:

We assume that increasing the level of physical and coordination training in adolescent volleyball players will to varying degrees affect the mastery and effectiveness of their technical actions, as well as optimize their competitive performance.

II. PURPOSE, TASK, METHODOLOGY AND ORGANIZATION OF THE RESEARCH

The purpose of this study is, by establishing the level and subsequently developing the specific working capacity of 14-15 year old volleyball players, to optimize the training process by improving the mastery of volleyball technique.

To achieve this goal, we set the following **tasks**:

1. Study of literary sources on the problem.
2. To establish the level of physical development, coordination abilities and technical skills of volleyball players of these ages.
3. To reveal the relationship between the indicators of specific working capacity and technical skills of 14-15 year old volleyball players.
4. To develop a specialized program for the development of the physical and coordination abilities of 14-15 year old volleyball players, supporting the process of mastering and improving volleyball technique.
5. To establish the reliability of the results obtained after the implementation of the specialized program, assessing the technical and physical indicators of adolescent volleyball players.

The object of the study are anthropometric, conditioning, coordination and technical parameters related to the game of volleyball.

The subject of the study is the training process of 14-15 year old volleyball players, training intensively.

The scope of the studied subjects includes 47 boys aged 14-15 years from three volleyball clubs.

- The first stage includes testing all 47 athletes (20 from VASK, 12 from VC "Slavia" and 15 from VC "Lyulin"), with the aim of recording initial results before the implementation of the specialized training program.
- The second stage includes testing the 20 athletes from VASK (experimental group), as well as the 16 volleyball players from VC Slavia (control group).

Research methodology

1. Analysis of information sources

In regards of the research problem, we conducted an information survey of bulgarian and foreign authors. After the theoretical analysis and generalization of the information received, our concepts on the research problem were formed.

2. Sports - pedagogical testing

The current (initial) state of anthropometric, physical, coordination and technical characteristics and skills of 14-15 year old volleyball players was established and their development was monitored during the research period. When selecting the indicators, the following requirements were taken into account: to provide information on the development of various motor skills and technical skills; to have proven reliability, validity, accessibility, objectivity and standardization; to be applicable in field conditions. The anthropometric data are presented in (**Table 1**).

Table No. 1 Anthropometric data indicators

№	Indocator	Unit	Measurment accuracy	Direction of increase
1.	Height	cm	0,5	+
2.	Reach	cm	0,01	+

Five indicators were used to study the physical performance of the competitors (**Table 2**).

Table No. 2 Physical fitness indicators

№	Indicator	Unit	Measurment accuracy	Direction of increase
3.	20m sprint	sec	0,01	-
4.	Long jump	cm	1,0	+
5.	Vertical jump	cm	1,0	+
6.	Vertical jump with approach	cm	1,0	+
7.	Lateral movement	cm	0,01	-

To study the special speed of young volleyball players, we used special sensor equipment and examined four parameters for the two tests - "Simple scheme" and "Complex scheme" (**Table 3**).

Table No. 3 Special speed indicators

№	Indicator	Unit	Measurment accuracy	Direction of increase
8.	Reaction time	sec	0,01	-
9.	Fastest path	sec	0,01	-
10.	Slowest path	sec	0,01	-
11.	Average time	sec	0,01	-

To study the coordination characteristics of the competitors, we use 3 tests (**Table 4**).

Table No. 4 Coordination indicators

№	Indicator	Unit	Measurment accuracy	Direction of increase
12.	Tennis ball	sec	0,01	-
13.	12 squares	sec	0,01	-
14.	Over-under	sec	0,01	-

To study the technical abilities of the players, we analyzed 9 indicators covering the main elements of volleyball – overhead and underhand passing, serve and swing attack.(**Table 5**).

Table No. 5 Technical skills indicators

№	Indicator	Unit	Measurment accuracy	Direction of increase
15.	2 hands overpass from z.3 to z.4 in a ring	count	1,0	+
16.	2 hands overpass from z.1 to z.4	count	1,0	+
17.	2 hands underpass in target	count	1,0	+
18.	2 hands underpass after movement	count	1,0	+
19.	Serve line	count	1,0	+
20.	Serve diagonal	count	1,0	+
21.	Short serve	count	1,0	+
22.	Swing line	count	1,0	+
23.	Swing diagonal	count	1,0	+

3. Sports - pedagogical experiment

The purpose of the experiment is to establish the effectiveness of the specialized training program, aimed at improving the special working capacity of the young volleyball player, and hence for the quick and correct mastering of volleyball technique. Subsequently, the training program will be improved and proposed for application in practice.

Before the beginning and after the end of the pedagogical experiment, tests will be conducted to establish:

- the level of physical, coordination and technical skills and abilities of 14-15 year old volleyball players
- the changes in the observed signs that occurred as a result of the applied experimental impact

Research methodology

The following mathematical - statistical methods were used in processing the results: Variation analysis; Correlation analysis; Comparative Student's t-test for normally distributed dependent and independent samples, Comparative Wilcoxon's t-test for non-normally distributed dependent samples and Comparative Mann-Whitney U-test for non-normally distributed independent samples.

III. ANALYSIS OF THE RESULTS

III.1. Sports - pedagogical experiment

III.1.1. Comparative analysis of the average levels of the control and experimental groups at the beginning of the experiment

In order for the analysis to be accurate, it is necessary to determine the input and output levels of the indicators we studied and to make a comparison that would establish the significance of the differences at the beginning and at the end of the experiment in the two groups of volleyball players studied. It is also very important at the beginning of the study to establish whether the two groups start with relatively equal opportunities, by comparing mainly their anthropometric data, as well as the other indicators - coordination and technical. The ultimate goal is to achieve and establish a higher growth of the data of the experimental group compared to the experimental one at the end of the testing, achieved thanks to the methodology proposed by us for developing the technical qualities of 14-15 year old volleyball players.

Fig.1 presents the average values of the anthropometric indicators of the experimental and control groups. Results were almost identical, with a slight bias for the control group.

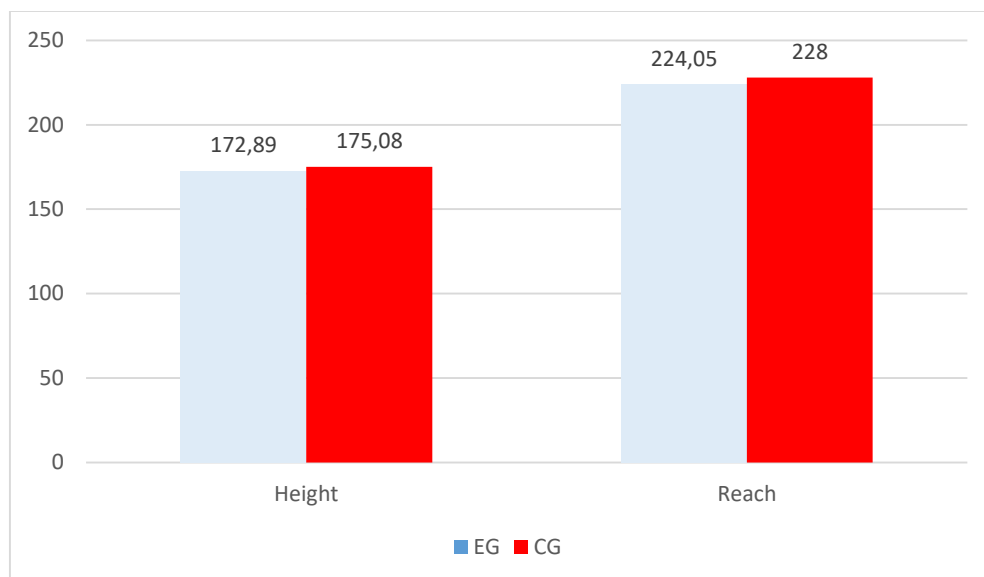


Fig.1 Comparative analysis of anthropometric indicators before the experiment

In **Fig. 2** and **Fig. 3** we examine the physical performance of the two teams. Comparing the average values before the experiment, we can see very close results in terms of horizontal movements – 20 meters smooth running (sprint) and lateral movement. In both tests, the experimental group has better values with 3.80 seconds in the sprint and 9.28 seconds in the lateral movement. In the control group, these values are 3.81 seconds and 9.35 seconds, respectively. In the remaining three indicators, which are related to rebounds, the volleyball players of “Slavia” achieved better results.

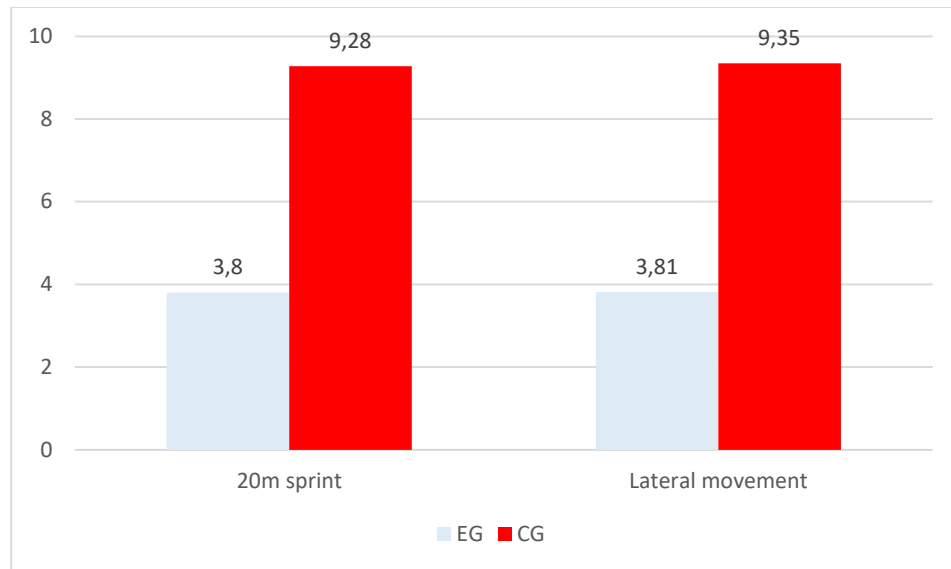


Fig.2 Comparative analysis of the indicators "20m sprint" and "Lateral movement" before the experiment

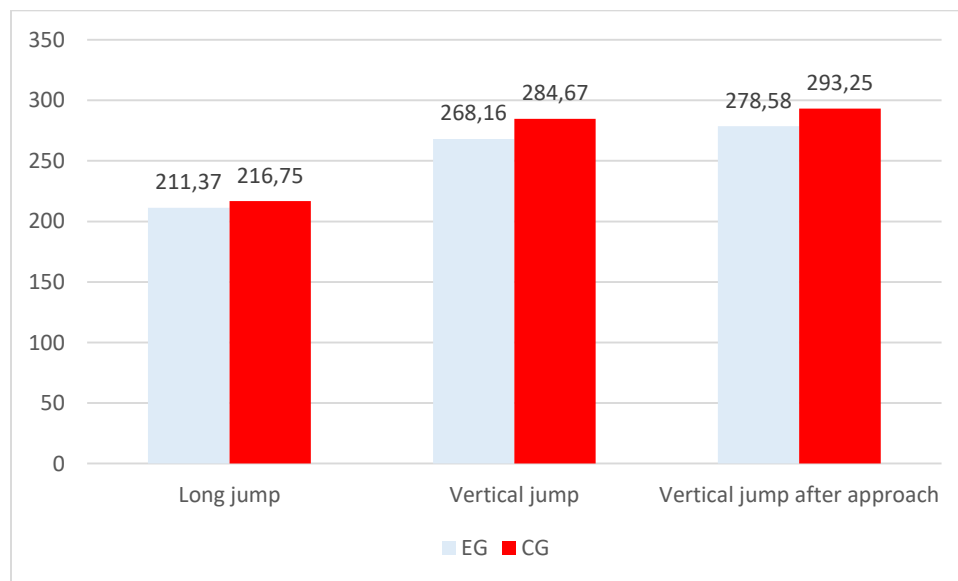


Fig.3 Comparative analysis of the indicators "Long jump", "Vertical jump" and "Vertical jump after approach" before the experiment

The next group of indicators is again related to physical performance and more specifically to specific speed, but we have separated them into a separate table because they were made with special sensor equipment. The first 4 indicators refer

to the tests from the "Simple scheme" (SS), and the second 4 are from the "Complex scheme" (CS). The average values are presented in **Fig. 4**. As expected, the results follow the trend of sprint running and are extremely close to each other. In terms of better performance at the beginning of the study, VASK volleyball players were faster in seven of the eight indicators, and only in the "SS slowest section" did the slavists perform better - 1.12 sec. against 1.15 sec.

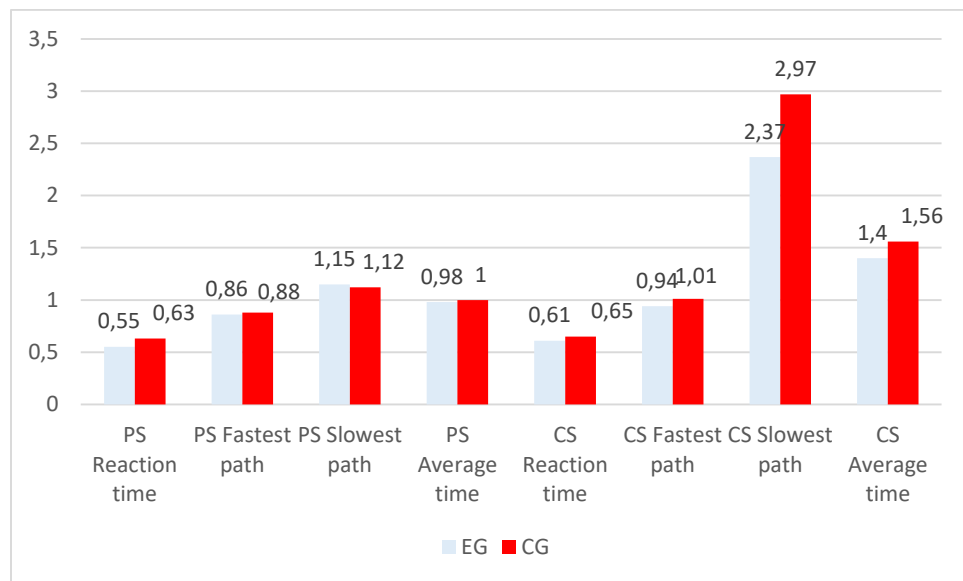


Fig.4 Comparative analysis of the specific speed indicators from the “Simple scheme” and “Complex scheme” before the experiment

The next category of tests shows the coordination capabilities of young volleyball players. **Fig.5** illustrates the average values of the three tests. In the first of them (Tennis ball) we have the largest difference in the results of the two groups. The VASK team achieved a level of 25.68 catches in 30 seconds, while the Slavia players made an average of 21.08 catches. The other indicator in which the EG again performed better is “12 squares” with a result of 11.94 sec, against 12.52 sec for the CG. Only in “Over-Under” we have the opposite trend – 15.59 sec for VASK team and 14.22 sec for Slavia.

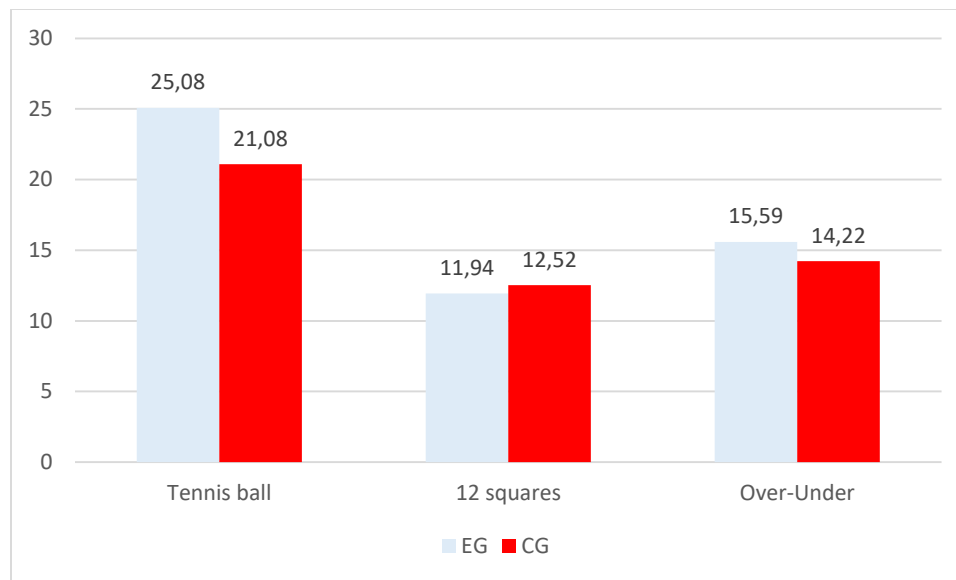


Fig.5 Comparative analysis of coordination ability indicators before the experiment

The last group of indicators that we will examine are those for the technical abilities of the players from both teams. Here we have nine tests that show the children's abilities in terms of the main elements in volleyball - overhead pass, under pass, serve and swing attack

Starting with the first two parameters, we notice the better performance of the volleyball players from "Slavia", who registered an average result of 5.83 accurate hits in the overhead pass from zone 3 and 5.42 hits in the overhead pass from zone 1, while the experimental group recorded 5.68 and 5.26 success rates, respectively. Regarding the two-handed passes from below, which are more difficult as a technique at this age, we also notice logically lower results. However, the trend remains the same and again the control group team has better results.

In the remaining five tests, for serve and swing attack, the boys from VASK performed better. The smallest difference is in the execution of a short kick-off, where CG achieves 3.75 accurate hits out of 10 attempts, while EG has 3.95. The largest difference is in the kick-off on the straight line – 5.84 hits for the players of VASK and 5.25 for those of Slavia. The serve on the diagonal retains almost the

same proportionality of results, with slightly lower absolute values – 5.21 for EG and 4.75 for CG.

Finally, we look at the average values in the attack. The larger differences between the two teams are impressive. In terms of dunking on the straight line, we have almost a whole unit of difference, with CG score of 3.42 on this indicator being the lowest of all in the group of technical indicators. The experimental group here registers a result of 4.37 accurate hits. Both teams performed better in terms of diagonal dunking – exactly 5 hits on average for the VASK volleyball players and 4.25 for the Slavia boys. All values are illustrated in **Fig. 6**

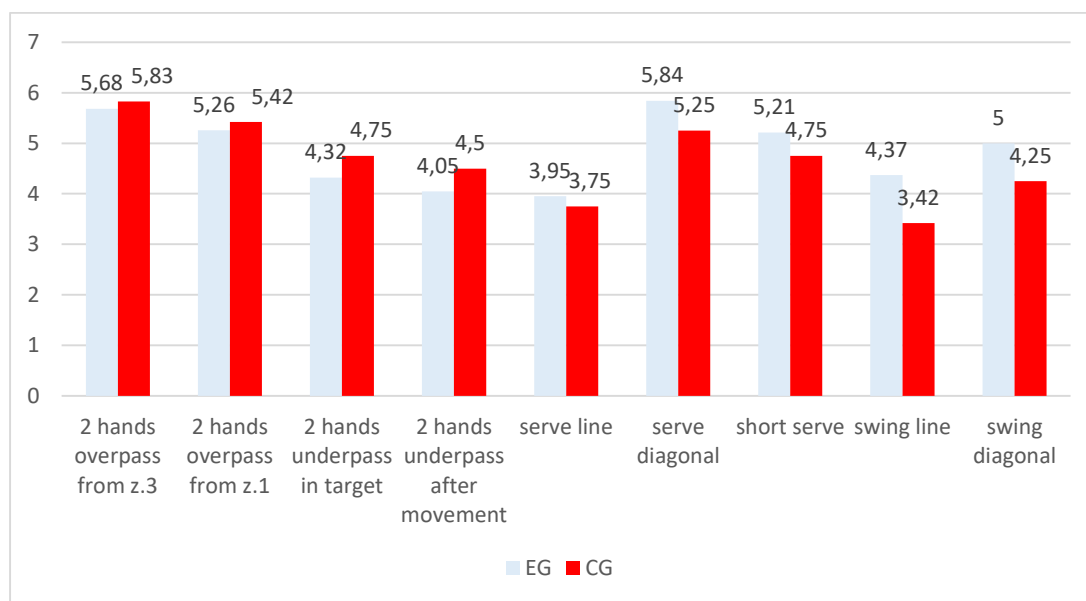


Fig.6 Comparative analysis of technical capability indicators before the experiment

III.1.2. Comparative analysis of the average levels of the control and experimental groups at the end of the experiment

We begin with the results of the anthropometric indicators. We will consider only the height (**Fig. 7**), since in terms of the reach when establishing the significance of

the increase in CG in the third chapter we saw that the differences were statistically insignificant. From the graph it is clear that the control group has a higher average height than the experimental group after the end of the second study.

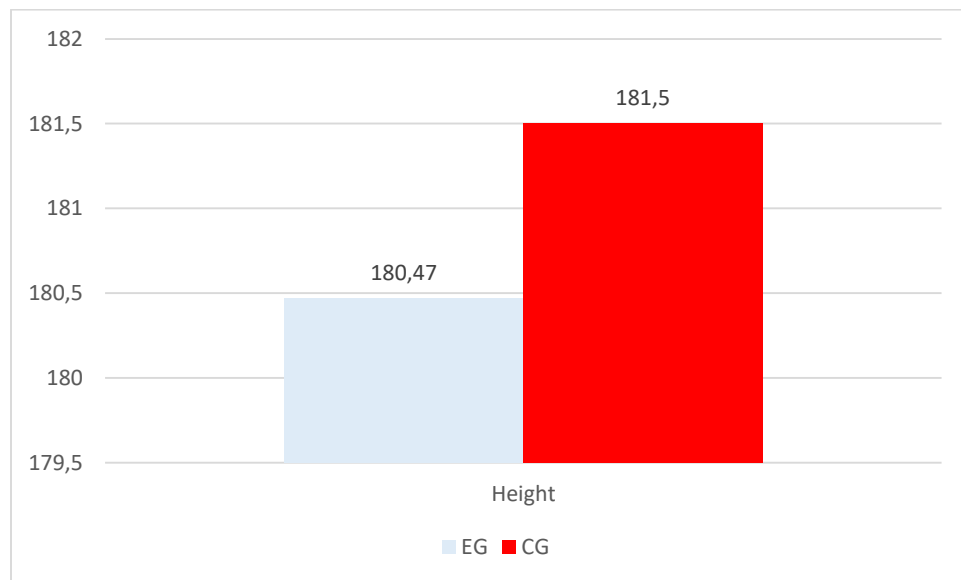


Fig.7 Comparative analysis of anthropometric indicator “Height” of EG and CG after the experiment

We continue with the results of the physical performance of the competitors, as the two vertical jumps, which had statistical significance at the beginning of the study, were removed from the analysis. **Fig. 8** presents the two speed tests, and in both cases the experimental group was faster, although with minimal differences. In the 20m sprint, the average results are 3.55sec. for EG versus 3.64sec. for CG, while in the lateral movement 8.75sec and 8.95sec respectively.

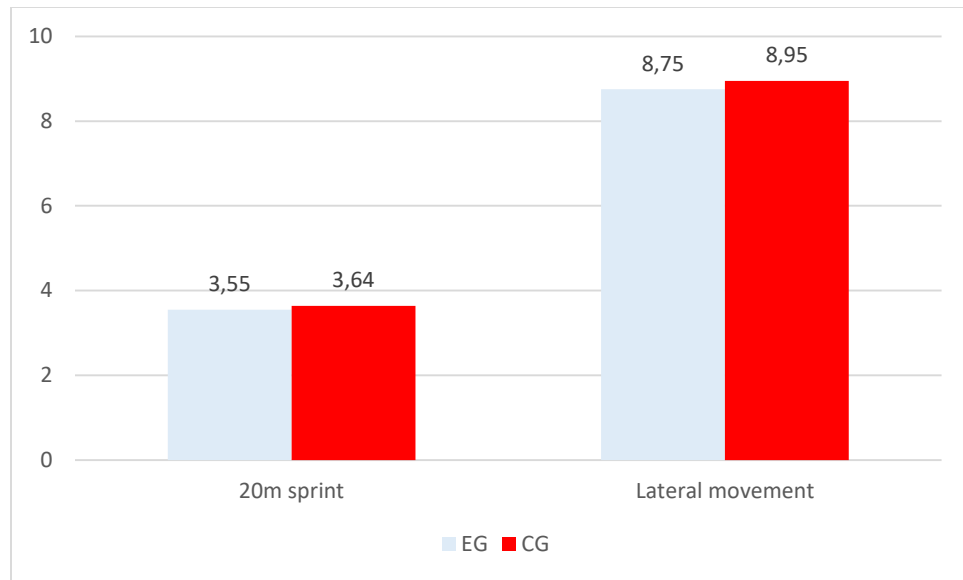


Fig.8 Comparative analysis of the indicators "20m sprint" and "Lateral movement" after the experiment

In terms of the long jump, we have superiority for the control group, which achieved an average of just over 5cm better result. (**Fig.9**)

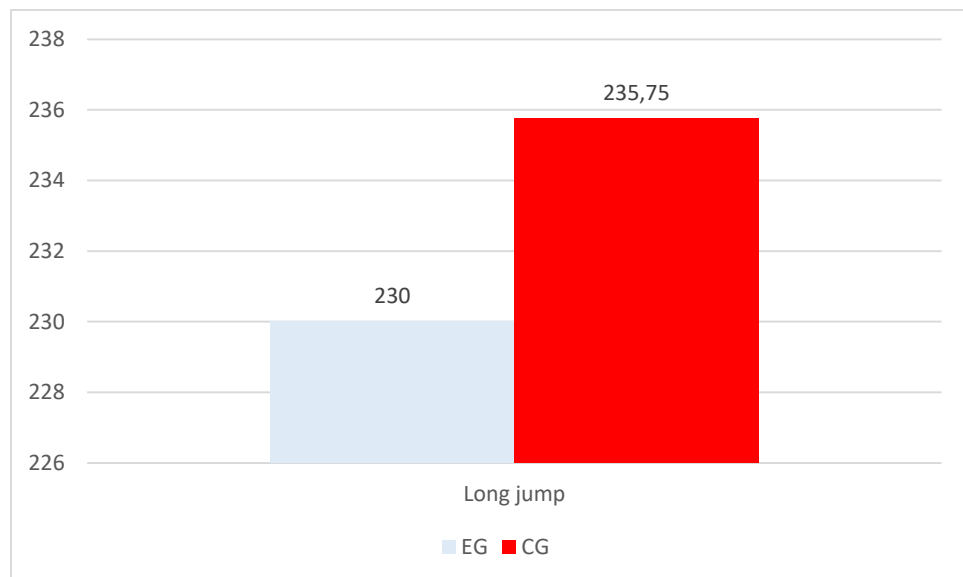


Fig.9 Comparative analysis of the indicators "Long jump" after the experiment

The next group of tests are for specific speed "Simple scheme" and "Complex scheme" **Fig. 10** presents the average values after the second study, with $\frac{3}{4}$ of the indicators removed due to lack of statistical significance in the previous analyses. We have only two indicators left, one each for "Simple scheme" and "Complex scheme". In both, VASK's team registered better results than Slavia's. According to the indicator "SS fastest section", the average time for passing the competitors from EG is 0.78 seconds, while for those from CG it is significantly longer - 0.89 seconds. Regarding the CS slowest section, the results are 0.96 seconds. for EG against 0.99 seconds for CG.

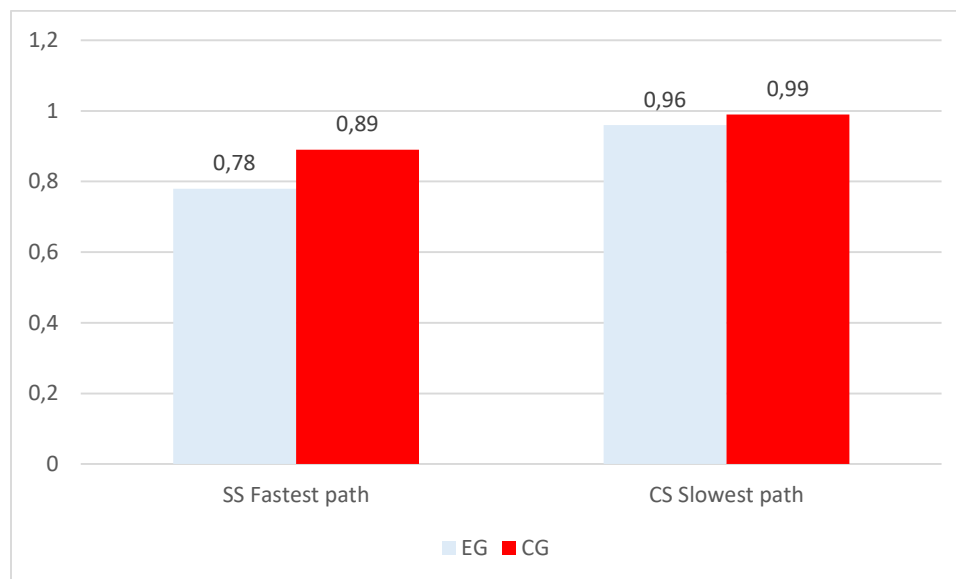


Fig.10 Comparative analysis of the specific speed indicators „SS fastest path” and “CS slowest path”after the experiment

Penultimately, we examine the differences in the coordination capabilities of the two groups (**Fig. 11**). In the only remaining test (“12 squares”), we establish the superiority of the experimental group. The VASK competitors needed an average of 1 second less to complete the task with a result of 11.02 seconds, while the “Slavists” passed in an average of 12.03 seconds. This is a nearly 9% difference.

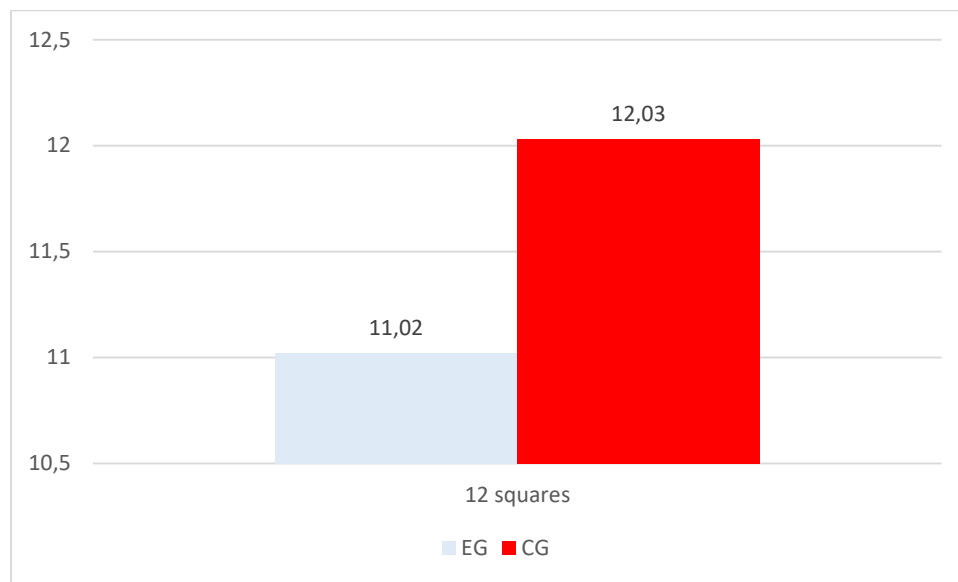


Fig.11 Comparative analysis of the indicators of coordination abilities "12 squares" of EG and CG after the experiment

Finally, we will look at the indicators of the technical abilities of the two teams from the second study (**Fig. 12**). We see that in all elements the experimental group outperforms the control group. Even in the first four tests, where in the first study the CG had registered higher average values. In the two-handed overhead pass we have average values over 7 and differences of almost 1 accurate hit in EG, which is an excellent result. In the two tests for the overhead pass, the performance of the two teams is close to each other in values. In the 3rd indicator we have 6.16 successful attempts against 6 for EG, and in the fourth indicator 5.68 against 5.42. The largest differences are registered in dunking. The result of the CG in swinging line is impressive, where with 4.42 average success it lags behind 1.37 hits from EG. The situation is no different in swing diagonal, where although with a much better result of the Slavists of 5.50, the volleyball players of VASK make a difference of an average of 1.45 hits more with their result of 6.95 successful swings in the second

study. Regarding the serve, in all three tests we have differences below 1, with the closest being in the short serve – an average of 5.21 successful serves for EG and 5.08 for CG.

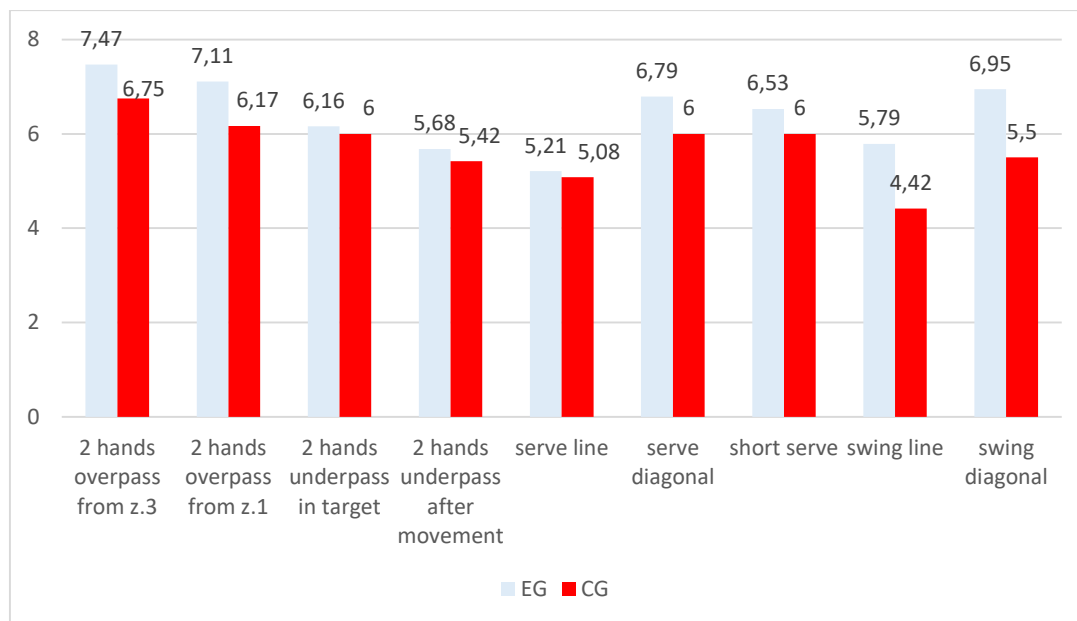


Fig.12 Comparative analysis of technical capability indicators before the experiment

III.2. Correlation analysis of the studied indicators

We will examine and analyze the nature of the relationships and the strength of the dependence between the growths of the studied parameters. We apply correlation analysis to establish the number of available relationships and dependencies, as well as their strength and direction. The Pearson's simple linear correlation coefficient (r) was calculated for the number of measurable quantities with a linear dependence in form.

The strength of the relationship is determined by the absolute value of the correlation coefficient:

- up to 0.4 – moderate relationship
- from 0.4 to 0.7 – significant relationship
- over 0.7 – strong relationship

The figures in the following subsections depict only the relationships with a Pearson correlation of over 0.3

III.2 Establishing the strength of the relationship between the increases in the indicators of the experimental group after the experiment

Fig. 13 shows the correlation relationships between the growth in the two anthropometric indicators and those for the technical capabilities of the athletes from the experimental group. We can notice four results that are of moderate relationship, but close to significant (with values above 0.3). These are the relationships height – serve line ($r = 0.319$), height – underhead pass to the ring in zone 3 ($r = -0.379$), reach – swing line ($r = -0.310$) and reach – serve diagonal ($r = -0.371$). A significant correlation was found between diagonal swing and height ($r = 0.490$) and reach ($r = 0.487$).

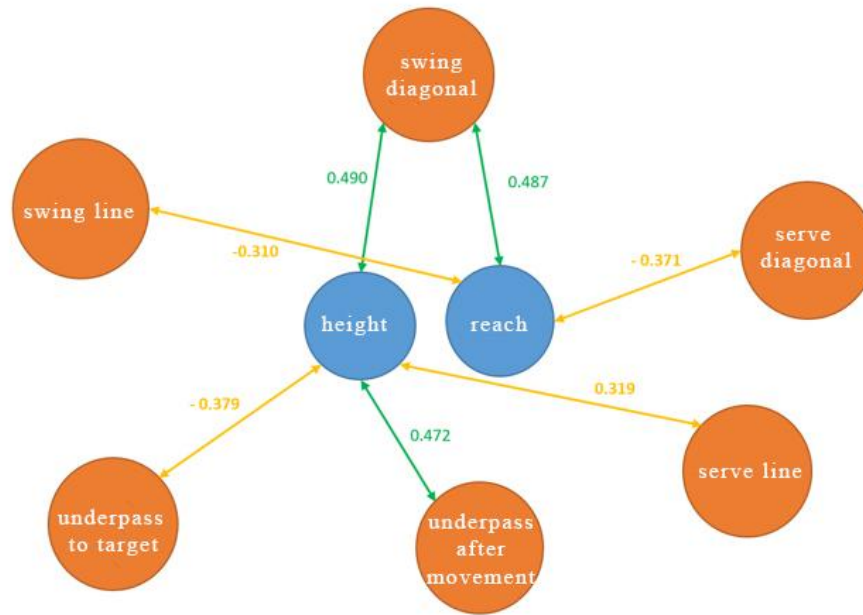


Fig.13 Correlations between growth rates for anthropometric data and technical capabilities of the EG.

In the following diagram (**Fig. 14**) we examine the correlations between the increases in physical performance indicators and technical skills. In this network we see one relationship that is strongly dependent - between "high jump after approach" and "diagonal serve", where $r = 0.752$. We also have five correlations with a value above 0.4, which makes the relationships significant. These are "sprint" - "serve diagonal" ($r = 0.494$), "high jump" - "2 hands overhead pass to the ring in zone 3" ($r = 0.422$), "high jump" - "short serve" ($r = 0.464$), as well as "lateral movement" with "2 hands underpass to the ring" ($r = 0.564$) and "lateral movement" with "short serve" ($r = 0.406$). We also note three relationships with values between 0.3 and 0.4.

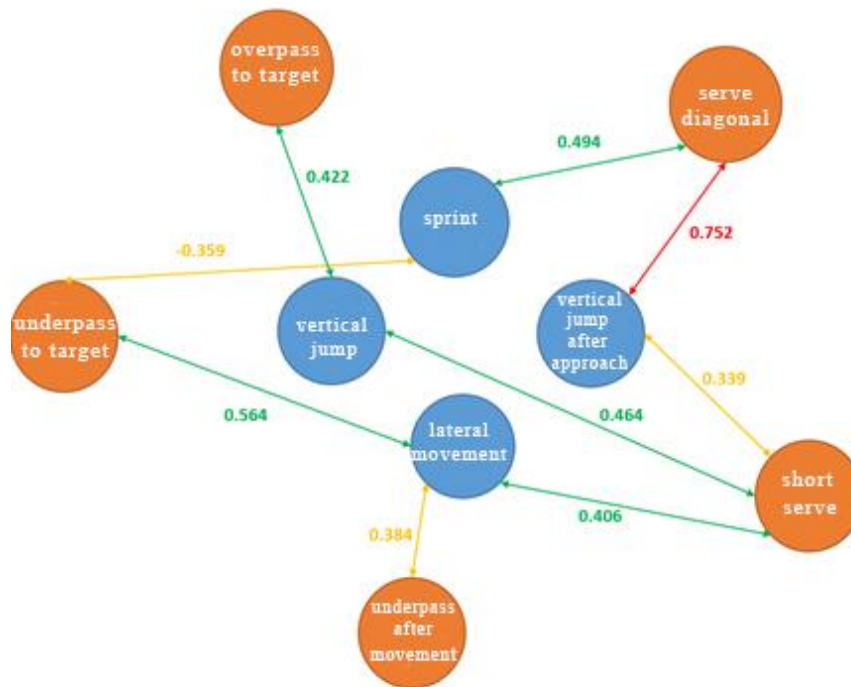


Fig.14 Correlations between increases in physical capacity and technical capabilities of the EG

In the following **Fig.15** we establish the relationships between the growth of the indicators of specific speed and the technical capabilities of the EG. Here we do not have a relationship with a strong dependence, but we have many with a significant one. It is noticeable that half of the indicators of specific speed that have dependencies with the technical indicators are from the “Complex scheme”. Here we can make a direct comparison with the game of volleyball, where situations are unpredictable and we do not have clarity about what will happen at each next moment or where the ball will be directed. It is the relationship “SS worst time” - “swing line” that has the most significant correlation of 0.623. A total of 8 out of all 12 correlation relationships in this diagram are related to the indicators from the “Complex scheme” tests. The speed of reaction correlates significantly with the two

indicators for 2 hands underpass in target ($r = 0.504$) and after movement ($r = 0.443$). In a game, it is the reaction to the reception and defense that are the key factors for the successful execution of the element.

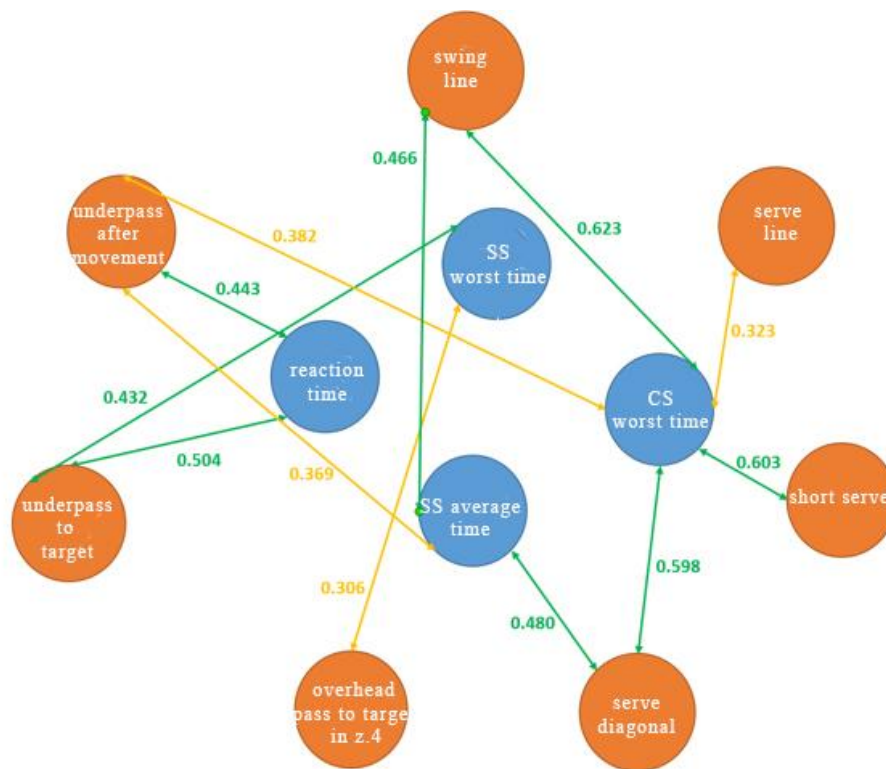


Fig.15 Correlations between the growth rates for specific speed and technical capabilities of the EG

In the correlations between the growth of the coordination and technical abilities of volleyball players, we do not have many that have a significant dependence. In **Fig. 16** we see that the most connections are in “over under”, the results of which correlate moderately with the “serve diagonal” ($r = 0.304$), “serve line” ($r = 0.310$) and “2 hands underpass to the ring in zone 3” ($r = 0.379$). The results of “tennis ball” correlate only with “serve diagonal” (0.322), and the only relationship with a strong

correlation is established between the indicators “12 squares” and “2 hands underpass after movement” ($r = 0.532$).

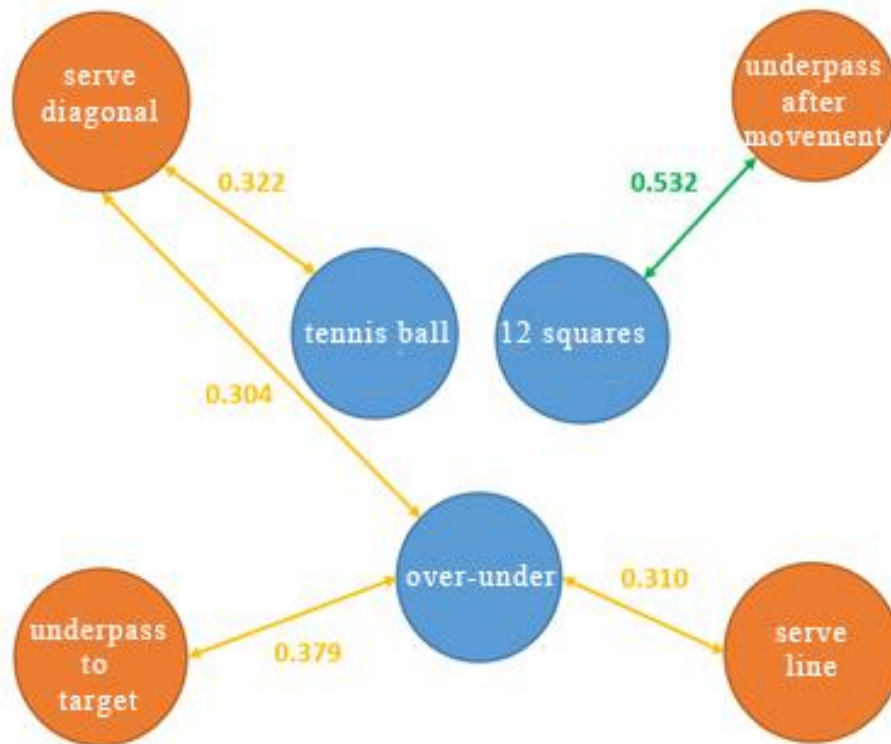


Fig.16 *Correlations between the growth of coordination abilities and technical capabilities of the EG.*

In conclusion of the correlation analysis of the growths, we want to pay attention to the technical element of passing with two hands from below, repeated with its two indicators with significant and strong connections in all sub-analyses made above. This gives us reason for reflection and interesting hypotheses. One of them is the complexity of this element and its dependence on various qualities and skills of the young volleyball player for its successful performance. Both physical (in particular speed) abilities are required, as well as good coordination and agility. This is why this element is considered one of the most difficult and at the same time fundamental

for the volleyball game. This is why the reception is included in the daily training programs of all elite volleyball teams.

IV. CONCLUSIONS AND RECOMMENDATIONS

IV.1 Conclusions

- I. After processing the data and performing the variance analysis, we can draw the following conclusions:
 1. The most pronounced uniformity in both groups is in terms of anthropometric and physical performance indicators. It is maintained after the end of the experiment, being most significant in indicators No. 1 (Height) and indicators No. 2 (Reach).
 2. The greatest heterogeneity in both groups at the beginning of the experiment is registered in the technical indicators. In the experimental group, these are: "swing line", "Two-handed pass from below to different zones" and "Two-handed pass from below to the ring". For the control group, these are: "short serve", "swing diagonal" and "swing line"
 3. Under the influence of the experimental training program, the experimental group registered higher average values than the control group in all indicators of technical performance.

- II. After processing the data and the correlation analysis of the obtained increases between the studied indicators, the following conclusions can be drawn:
1. The indicators “2 hands underpass in target” and “2 hands underpass after movement” have significant and strong relationships in all studied subgroups of indicators in both EG and CG. This shows the significance and complexity of this volleyball element.
 2. In the control group, a large number of moderate interrelationships were established between the indicators for specific speed and those for technical abilities. The most significant indicator in these correlations is the reaction time of the competitors.
- III. After processing the data and establishing the significance of the increases, we can draw the following conclusions:
1. From starting with 27 indicators at the beginning of the study, at the end there are 10 that have a significant difference. These are reach, "SS fastest path", "CS average time", "CS fastest path", "swing line", "swing diagonal", "serve diagonal", Two-handed overhead pass to ring from zone 1" and "Two-handed overhead pass to ring from zone 3"
 2. The highest significance coefficient is for "SS fastest path" and "swing diagonal"
 3. The least impact of the specialized training program and, respectively, the lowest coefficients are for sprinting and lateral movement

IV.2. Recommendations

In order to increase the quality of management of the training process and improve the technical abilities of volleyball players aged 14-15, we recommend:

1. Innovative devices and tools to be used as effectively as possible in the training process and, above all:
 - the service machine to be used in every training session in which reception and defense are worked on.
 - to allocate time daily for individual work with the setters, using the rings to master the two-handed overhead pass.
 - to implement block simulators in the training activity when working on block, attack and covering
2. In the training process, to allocate more time for the basic elements – underhead pass, overhead passing and serve, with the main goal being the maximum number of repetitions on a weekly basis with correct execution technique.
3. The development of the technical abilities of the young volleyball player should be carried out in unity and interrelation with the development of the physical and coordination qualities of the competitors.
4. Given the specificity of the volleyball game and the non-repeatability of two identical situations, the improvement of all technical elements (except for the serve) should be carried out with constant change in the conditions of execution.

IV.2. Contributions to sports practice

In this dissertation work, a comprehensive study has been conducted on adolescent volleyball players, covering anthropometric, physical, coordination and technical indicators. Through a systematic approach, the level of development of these characteristics and the dynamics of their change in the process of training impact have been analyzed.

An experimental training program has been developed, including modern devices and tools that have not been used in practice in our country so far. Their positive impact on the development of motor qualities, coordination abilities and technical preparation of young volleyball players has been established. A systematization of the key indicators determining the effectiveness of the training process in this age group has been made.

The theoretical significance of the study is expressed in expanding and enriching scientific and methodological knowledge regarding modern aspects in the training and education of adolescent volleyball players. The results obtained contribute to the improvement of the theory and methodology of sports training, especially in the part related to the integrated development of physical, coordination and technical abilities in the early stages of sports improvement.

The practical significance lies in the development and implementation of an innovative training methodology based on the use of modern tools and technologies, such as a service machine, a block simulator, a slam dunk device, etc. The proposed exercises and training approaches create conditions for a more effective increase in sports and technical improvement as well as improving the physical training of athletes, which is a key factor in achieving high results in training and competition activities.

The materials and conclusions from the dissertation work can be successfully applied in the training process for adolescent volleyball players, as well as in the system of physical education, in order to increase the effectiveness of training and optimize training in sports with a pronounced coordination focus.

PUBLICATIONS RELATED TO THE THESIS THEME

1. Analysis of the distribution of indicators of specific employability of 13-14-year-old volleyballers: NC "Optimization of the pedagogical process in basketball, volleyball, handball"; May 17, 2019 / Velizar Pashov. // Yearbook of the National Sports Academy "Vasil Levski": Volume 1. (Sofia). - Sofia: NSA PRESS, 2019, pp.328-334; ISSN: 2682-9908
2. Deficit in glenohumeral internal rotation (GIRD syndrome) in adolescent volleyball players: Simona Bogdanova, Lyubomira Sazdova, Vladimir Rusimov, Nikolay Rusimov, Valeri Banchev, Velizar Pashov // Journal of Medicine and Sport; ISSN: 1312-5664 (in press)