

METHODICAL CONDITIONS FOR INCREASING THE INDICATORS OF TECHNIQUE ON THE BASIS OF SPECIAL PHYSICAL TRAINING OF YOUNG SQUASH PLAYERS

Artemii Perun¹, Rehina Andrieieva¹, Viktoria Koval¹, Oksana Shvets²

¹ Kherson State University, Kherson, Ukraine, RAndreeva@ksu.ks.ua

² Vinnytsa State Pedagogical University named after M. Kotsyubinsky, Vinnytsia, Ukraine, o.shvets1802@gmail.com

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Abstract

Current physical and technical preparation of young squash players and their coordination were evaluated during formative experiment. Experimental study was carried out from September 2016 to May 2017. Twelve squash players of 9–11 years old (4 young squash players of 9 years old, 10 years old and 11 years old, respectively) participated in the studies, which were conducted on the basis of Fitness club «Sport-Life» in Kherson. All squash players belonged to the main medical group.

For the purpose of qualitative organization of experimental research, we chose a method of analysis and synthesis of scientific and methodological data, special and informative sources, methods of monitoring the organization of training process, methods of pedagogical testing, and methods of mathematical statistics (calculated methods of average and false values, percent values, and method of correlation analysis).

Results of the previous research on preparation of young athletes, conducted by us at the beginning of preparatory period, allowed indicating characteristic indices for the majority of young athletes that were below middle level. The number of athletes with the middle level of physical and technical preparation increased considerably after the formative experiment. Due to the obtained data it was possible to state high efficiency in elaborated by us program for training session at the stage of initial preparation of young squash players. The analysis made does not cover all aspects of solving the problem in question.

Further study presupposes the investigation of the influence of squash training on various indicators of the physical condition of squash players, the analysis of the indicators of training and competitive activity of squash players, in the context of revealing their leading and indifferent physical qualities.

Key words: squash, young squash players, physical and technical preparation.

Артемій Перун, Регіна Андрєєва, Вікторія Коваль, Оксана Швець. Методичні умови підвищення показників техніки на основі спеціальної фізичної підготовки юних сквошистів. У статті подано оцінку фізичної й технічної підготовленості юних сквошистів, а також їх взаємозв'язок у ході формувального експерименту. Експериментальну роботу проведено із вересня 2016 р. до травня 2017 р. У дослідженнях на базі фітнес-клубу «Спорт-Лайф» м. Херсона взяли участь 12 сквошистів 9–11 років (по чотири юних сквошисти 9-, 10- та 11-річних відповідно). Усі спортсмени належали до основної медичної групи.

Задля якісної організації експериментально-дослідної роботи нами обрано метод аналізу й синтезу даних науково-методичних, спеціальних та інформаційних джерел, методи спостереження за організацією навчально-тренувального процесу, методи педагогічного тестування, математичної статистики (розрахункові методи середніх і помилкових величин, відсоткових значень, метод кореляційного аналізу).

Результати попереднього дослідження підготовленості юних спортсменів, проведеного нами на початку підготовчого періоду, дали підставу встановити, що для більшості юних спортсменів властиві показники нижчого за середній рівня. Після формувального експерименту значно збільшилася чисельність спортсменів із середнім рівнем фізичної й технічної підготовленості. Відтак можна констатувати високу ефективність запропонованої нами програми тренувальних занять на етапі початкової підготовки юних сквошистів. Проведений аналіз результатів експериментальної роботи не висчерпує розв'язання всіх аспектів означеної проблеми.

Подальшого вивчення потребує вплив занять сквошем на різні показники фізичного стану спортсменів, аналіз показників тренувальної й змагальної діяльності юних сквошистів у контексті виявлення провідних та індивідуальних фізичних якостей, що і є перспективою подальших досліджень у цьому напрямі.

Ключові слова: сквош, юні сквошисти, фізична та технічна підготовленість.

Артемій Перун, Регіна Андрєєва, Вікторія Коваль, Оксана Швець. Методические условия повышения показателей техники на основе специальной физической подготовки юных сквошистов. В статье дается оценка физической и технической подготовленности юных сквошистов, а также раскрывается их взаимосвязь в ходе формирующего эксперимента. Экспериментальная работа проводилась с сентября 2016 г. до мая 2017 г. В

исследованиях на базе-фитнес клуба «Спорт-Лайф» г. Херсона приняло участие 12 сквошистов 9–11 лет (по четыре юных сквошиста 9-, 10- и 11-ти лет соответственно). Все сквошисты относились к основной медицинской группе.

С целью качественной организации экспериментально-исследовательской работы нами избраны метод анализа и синтеза данных научно-методических, специальных и информационных источников, методы наблюдения за организацией учебно-тренировочного процесса, методы педагогического тестирования, математической статистики (расчетные методы средних и ошибочных величин, процентных значений, метод корреляционного анализа).

Результаты предварительного исследования подготовленности юных спортсменов, проведенного нами в начале подготовительного периода, позволили установить, что для большинства юных спортсменов характерны показатели ниже среднего уровня. После формирующего эксперимента значительно увеличилось количество спортсменов со средним уровнем физической и технической подготовленности. В связи с представленными данными, можно констатировать высокую эффективность предложенной нами программы тренировочных занятий на этапе начальной подготовки юных спортсменов. Проведенный анализ результатов экспериментальной работы не исчерпывает решение всех аспектов этой проблемы.

Дальнейшего изучения требует влияние занятий сквошем на различные показатели физического состояния спортсменов, анализ показателей тренировочной и соревновательной деятельности юных сквошистов, в контексте выявления ведущих и индифферентных физических качеств, что и является перспективой дальнейших исследований в данном направлении.

Ключевые слова: сквош, юные сквошисты, физическая и техническая подготовленность.

Introduction. One of the most actual problems of modern sport is the preparation of sport reserve. It is actual and valuable nowadays to choose training methods that correspond to the elementary level of young athletes training, to conduct rational training lessons. All peculiarities and regularities are of great importance for young athletes.

Squash – is a sport game, played with a racket and a ball. This game is characterized by speed staying power, fast reaction and coordination. Complex approach for the developing of these abilities requires a wide range of training methods. At the same time, there are a great number of questions about the development of the basic physical abilities of the young squash players that need to be investigated and substantiated.

Squash is considered to be one of the most demanding kinds of sport. According to the latest reports of one of the most authoritative magazines, «Forbes», squash is proved to be the kind of sport that has different demands for the physical training of sportsmen. At the same time, specifics of different kinds of sport requires concentration on definite peculiarities of physical training, for example, marathon runners need to have aerobic training, squash players need both aerobic and non-aerobic training, power training, speed training, mobility exercises, etc., thus it has a complex nature [5; 6; 7; 8].

Nowadays, to master squash technique, one needs to have various motor skills, excellent coordination movements in combination with pinpoint arm actions. Young sportsmen at the age of 9–10 years old are able to demonstrate difficult exercises that absolutely correspond to the elementary level of physical training. There still exist some difficulties because of the steady increase in the proficiency of players. One of the indispensable conditions is to improve methods of young athletes training.

The experience of prominent coaches reveals the contradictions of the approaches to the elementary training level of the young squash players. Famous coach Philip Yarrow claims, that beginner sportsmen should pay special attention to the overall physical skills training [7]. Besides, it is important to learn the abilities of the development of the endurance in combination with speed training. On the one hand, some specialists focus on the importance of the development of aerobic endurance [2; 4]. Other specialists on the other hand claim that a big amount of constant exercises decreases the value of the elementary training level of children sport. That gives satisfaction in movements and emotional comfort of children [3; 8].

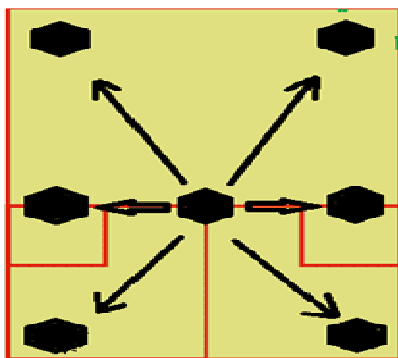
At the same time another famous coach Ian McKenzie claims, that on the elementary training level of young squash players, one needs to pay more attention to the technique of mastering specific elements [5]. The stated above peculiarities are controversial as far as the choice of effective methods of sport training of young squash players on the level in question is concerned. The development of modern squash training techniques is still not enough investigated.

The task of the research is to work out the methods of increasing physical proficiency of young squash players and to test experimentally their efficiency and influence on the technique training proficiency.

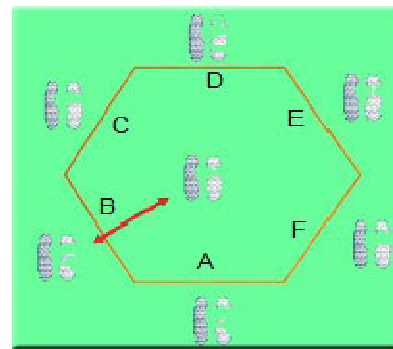
Preparation and Methods of the Research. Experimental testing was held from September 2016 till March 2017 in fitness club «Sport life» in Kherson. The participants were 12 squash players aged from 9 till 11 (4 squash players from each age group). The same participants took part in the formative experiment. All squash players belonged to the main medical group.

To provide a qualitative experimental testing, such methods were used: method of analysis and synthesis of research, methodological, special and informational sources; the method of observing the educational–training process, the method of pedagogical testing, and the methods of mathematical statistics (computational methods of average and erroneous, percentage, correlation analysis).

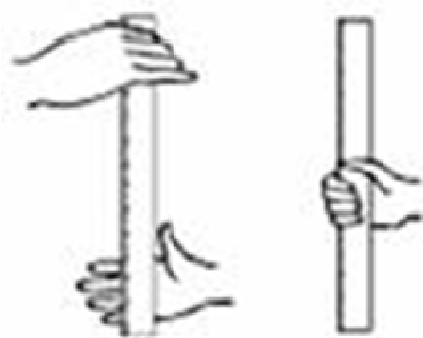
Pedagogical testing comprised a complex of tests to reveal the level of special physical skills and the quality of technical elements, made by the young squash players. The following tests were implemented (the specifics of the exercises is demonstrated in the picture 1): 1) shuttle run «6 points», movement coordination jumps (Hexagon Test); a grip of a falling stick. In order to prove the efficiency of the program, the young squash players were tested in right and left drive. Squash players make 10 right and 10 left drive-heats. One gets a score for hitting the ball onto the playable surfaces of the front wall of the court; scores are also rewarded for the length of the ball rebound and hitting the ball into a special area. The result – is the total of all scores for all successful hits.



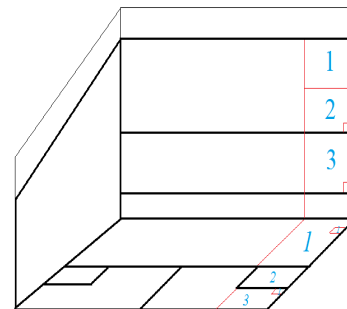
Test «6 Points»



Hexagon Test



Grab of a Falling Stick



The Technique Level Evaluation Test

Pic. 1. Characteristics of Pedagogical Testing of Physical and Technique Training Skills of Young Squash Players

Investigation. The results of the experiment, held at the beginning of the preparatory period, revealed, that the young squash players had the intermediate level of the physical training condition. It demonstrates that children, who do not go in for any kind of sports, have an intermediate level of overall physical training skills.

The calculation of the results of physical and technique training of the young squash players and their characteristics are demonstrated in table 1.

The analysis of the results of special physical abilities of the squash players shows, that 65 percent of the young sportsmen have an intermediate level of the development of dexterity (the results of the test «shuttle run with 6 points»). The low level of the physical development is revealed after the coordination movement test «Hexagon Test» (80 %). The results of the test «a grip of a falling stick» also show a low level of the physical development of a fast motor reaction – 75 % of all tested squash players.

As the results of the test demonstrate, most young squash players have a low level of physical training. Most their hits are of two score zone of the front wall and one score for the length of the rebound. None has managed to hit a ball onto a special zone. All these results reveal the necessity to improve the stated above results.

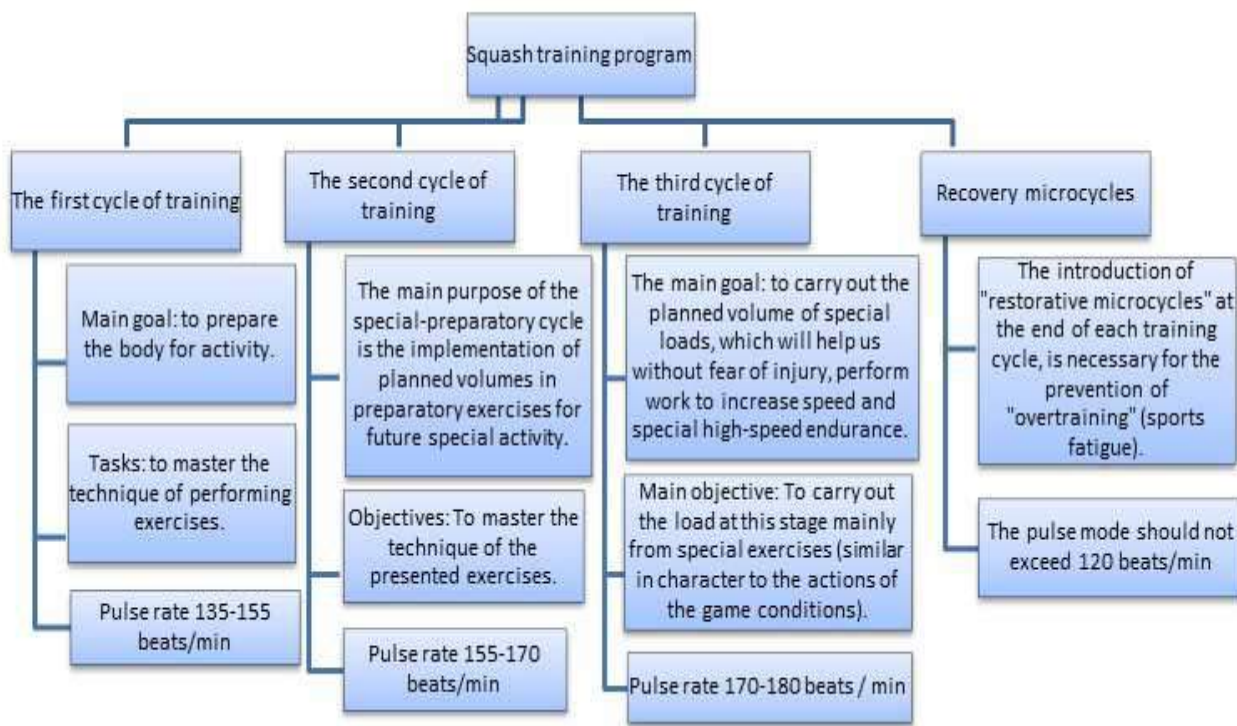
Table 1

Quantitative and Qualitative Characteristics of Special Physical and Technique Training Skills of Young Squash Players During the Ascertaining Experiment

| № | Control testing | Sportsman Number | | | | | | | | | | | | X±Smx |
|---|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Index of Special Training Skills | | | | | | | | | | | | | | |
| 1 | Shuttle run «6 points», c | <u>17,2</u> н | <u>16,9</u> с | <u>17,0</u> н | <u>16,8</u> с | <u>16,5</u> с | <u>17,1</u> н | <u>16,4</u> с | <u>16,3</u> с | <u>16,5</u> с | <u>17,3</u> н | <u>16,4</u> с | <u>16,5</u> с | 16,7±0,1 |
| 2 | Grip of a falling stick, см | <u>9</u> н | <u>11</u> н | <u>10</u> н | <u>15</u> н | <u>12</u> н | <u>9</u> н | <u>5</u> в | <u>6</u> с | <u>5</u> в | <u>9</u> н | <u>11</u> н | <u>10</u> н | 9,0±0,84 |
| 3 | Hexagon Test | <u>22</u> н | <u>20</u> н | <u>21</u> н | <u>18</u> с | <u>19</u> н | <u>21</u> н | <u>20</u> н | <u>22</u> н | <u>21</u> н | <u>18</u> с | <u>19</u> н | <u>21</u> н | 20,0±0,41 |
| Index of Special Training Skills | | | | | | | | | | | | | | |
| 4 | Right Drive Hit | <u>35</u> н | <u>32</u> н | <u>32</u> н | <u>34</u> н | <u>33</u> н | <u>30</u> н | <u>30</u> н | <u>31</u> н | <u>31</u> н | <u>31</u> н | <u>34</u> н | <u>30</u> н | 32±0,47 |
| 5 | Left Drive Hit | <u>30</u> н | <u>31</u> н | <u>32</u> н | <u>32</u> н | <u>30</u> н | <u>30</u> н | <u>31</u> н | <u>33</u> н | <u>30</u> н | <u>30</u> н | <u>31</u> н | <u>32</u> н | 31±0,32 |

Note: numeration – quantitative results, denomination – qualitative (н – low, с – middle, в – high)

For these purpose we have used the experience of the prominent specialists and developed the training program for young squash players. This program enables to develop special physical skills of young squash players by means of game method with the help of set of exercises for the overall physical training. It has three cycles (4–6 weeks each), which are split into microcycles (one microcycle is one week of training). Each microcycle, except the cycle of recovery, has 3–4 trainings a week. The training week is focused on the development of the physical skills in such a way: Monday – basic callisthenic exercises; Tuesday – first support auxiliary training; Wednesday – second main training; Thursday – rest from general physical training; Friday – second support auxiliary training; Saturday and Sunday are a tournament or a holiday. Schematically, the content of the training program is presented in pic. 2.



Pic. 2. The Physical Training of Young Squash Players

All the results, got after the implementation of the experimental methods of increasing physical and technique training of the young squash players, are demonstrated in table 2.

Table 2

Quantitative and Qualitative Characteristics of Special Physical and Technique Training Skills of Young Squash Players During the Formative Experiment

| № | Control Testing | Sportsman Number | | | | | | | | | | | | X±Smx |
|---|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Index of Special Training Skills | | | | | | | | | | | | | | |
| 1 | Shuttle run «6 points», c | <u>17.0</u> H | <u>16.5</u> c | <u>16.7</u> c | <u>16.4</u> c | <u>16.0</u> B | <u>17.0</u> H | <u>16.1</u> c | <u>16.5</u> c | <u>16.3</u> c | <u>17.0</u> H | <u>16.0</u> B | <u>16.1</u> c | 16,4±0,03 |
| 2 | Grip of a falling Stick, cm | <u>8</u> c | <u>12</u> H | <u>7</u> c | <u>10</u> H | <u>13</u> H | <u>8</u> c | <u>5</u> B | <u>6</u> c | <u>5</u> B | <u>9</u> H | <u>9</u> H | <u>8</u> c | 8,3±0,72 |
| 3 | Hexagon Test | <u>20</u> H | <u>17</u> c | <u>20</u> H | <u>15</u> c | <u>15</u> c | <u>22</u> H | <u>21</u> H | <u>19</u> H | <u>18</u> H | <u>16</u> c | <u>17</u> c | <u>22</u> H | 18,5±0,73 |
| Index of Special Training Skills | | | | | | | | | | | | | | |
| 4 | Right Drive Hit | <u>49</u> c | <u>47</u> c | <u>50</u> c | <u>51</u> c | <u>48</u> c | <u>42</u> c | <u>41</u> c | <u>39</u> H | <u>45</u> c | <u>43</u> c | <u>44</u> c | <u>42</u> c | 45±1,12 |
| 5 | Left Drive Hit | <u>45</u> c | <u>49</u> c | <u>45</u> c | <u>43</u> c | <u>44</u> c | <u>42</u> c | <u>36</u> H | <u>39</u> H | <u>49</u> c | <u>44</u> c | <u>41</u> c | <u>41</u> c | 43±1,09 |

Note: numeration – quantitative results, denomination – qualitative (H – low, c – middle, B – high)

The results of the research of the special physical skills and technique elements, demonstrated in table 2, confirm positive changes in physical skills of the young squash players. During the experiment, 75 % of the young squash players achieved the intermediate level of special exercise shuttle run «6 points», in comparison with 66 % of the squash players, who had such results at the beginning. The test «grip of a falling stick» demonstrated that 58 % of the squash players, who took part in the experiment, had intermediate level of the development of speed reaction, that proves the increasing effectiveness, that is 50 % , of this exercise of each squash player (at the beginning of the experiment 75 % of the young squash players had a low level of this quality). The same effectiveness was proved by the special Hexagon Test: 75 % of the examined sportsmen had below the average level of coordination abilities, thus, at the beginning of the test, 80 % of squash players had a low level.

As for the results of the technique proficiency of the young squash players, one can observe a positive dynamics of the technique of special exercises. During the formative experiment 91,7 and 83,3 % of the young squash players achieved the intermediate level of implementing technical elements in two testing exercises. At the same time, during the ascertaining experiment the results of most examined sportsmen were low. At the beginning of the experiment, most hits were of two–score zone of the central wall and one–score was given for the length of the rebound. One could observe no hits onto the special zone. Final results demonstrated the increasing number of hits onto the two–score zone, improvement of the length of the rebound (a three–score zone), pinpoint hits into special zones, for which additional score was awarded.

Absolute and relative changes in the process of the young squash players' training are demonstrated in table 3.

Considerable improvement between initial and final results of the young squash players' experimental testing was revealed in special physical training (table 3): the effectiveness of doing testing exercises in dexterity increased by 0,3, the effectiveness of Hexagon Test – by 1,5 c, what in percentage is 1,83 and 8,11 % ($p < 0,05 \div 0,01$)

Absolute positive changes in test “grip of a falling stick” reached 0,7 cm. Thus, the compared initial and final results didn't reveal any considerable divergence. According to our assumption, the development of the young squash players' special coordination skills should positively influence the process of teaching the technique of scoring main hits in a squash game.

Such methodological approach helped to achieve positive changes in the development of technique elements of the squash players of the experimental group – the effectiveness of right and left drive hits increased by 40,63 та 38,71 % ($P < 0,001$).

Table 3

Changes of the Researched Indices of Young Squash Players

| № | Control Testing | The stage of investigation | Result | Absolute Change | increasing in % | t | P |
|--|-----------------------------|----------------------------|------------------------|-----------------|-----------------|------|---------|
| Index of physical training skills | | | | | | | |
| 1 | Shuttle run «6 points», с | ВД КД | 16,7±0,1 16,4±0,03 | 0,3 | 1,83 | 3,0 | < 0,01 |
| 2 | Grip of a Falling Stick, см | ВД КД | 9,0±0,84 8,3±0,72 | 0,7 | 8,43 | 0,63 | > 0,05 |
| 3 | Hexagon Test | ВД КД | 20,0±0,41 18,5±0,73 | 1,5 | 8,11 | 1,8 | < 0,05 |
| Technique index | | | | | | | |
| 4 | Right Drive Hit | ВД КД | 32±0,47 45±1,12 | 13,0 | 40,63 | 10,8 | < 0,001 |
| 5 | Left Drive Hit | ВД КД | 31±0,32 43±1,09 | 12,0 | 38,71 | 10,5 | < 0,001 |

To prove the objective conclusion about the efficiency of the experimental methodology, we have established the interconnection of the level of special physical training and technique elements (table 4).

Table 4

Interconnection Between the Level of Special Training Skills and Technique Skills

| Index of Physical Training Skills | Index of Technique Training Skills | |
|-------------------------------------|------------------------------------|----------------|
| | Right Drive Hit | Left Drive Hit |
| Coordination skills | 0,72 | 0,77 |
| Fast reaction | 0,55 | 0,61 |
| Dexterity Shuttle run «6 points» | 0,52 | 0,65 |

The correlation analysis of general and special physical and technique training skills indices proved to have close interconnection:

- coordination skills of the young squash players have a high coefficient of interconnection with all the researched elements of the technique training skills from $r = 0,72$ till $0,77$;
- the same results we observe in the interconnection of the speed reaction with the elements of technique training skills, but their interconnection corresponds to such a level from $r = 0,55$ till $0,61$;
- a high and medium level of correlation between dexterity and young squash players' technique elements ($r = 0,52-0,65$);

The correlation analysis between the indices of technical and special physical training skills proved once more the hypothesis of our research: optimization of special physical training skills of young squash players has a positive influence on the quality of their performance of the technique of exercises.

Conclusion and Perspectives. The results, achieved during the formative experiment, proved, that at the starting period of the young squash players' physical training, the author's program positively influenced the increase in the level of special physical skills development, it improved the level of technique training skills of the young squash players.

The analysis of the results of the experimental testing does not solve all the questions of the researched issue. The influence of squash trainings on different indices of physical condition of squash players, the analysis of indices of training and competitive activities in the context of revealing leading and indifferent physical qualities need further research. It constitutes the perspective of further researches.

Sources and Literature

1. Белиц-Гейман С. П. Искусство тенниса. Москва: Физкультура и спорт, 1971. 255 с.
2. Бондарчук А. П. Периодизация спортивной тренировки. Киев: Олимп. лит., 2005. 304 с.
3. Годик М. А., Скородумова А. П. Комплексный контроль в спортивных играх. Москва: Сов. спорт, 2010. 336 с.
4. Проскурякова Н. Ю. Физическая подготовка юных теннисистов на этапе начального обучения: дис. ... магистра физ. культуры. РГУФК. Москва: 2003. – 78 с.: ил.

5. Ian McKenzie. Squash Skills by Ian McKenzie's. London, 2002. 324 p.
6. Peter A. Hirst. Squash: Skills. *Techniques. Tactics*. 2011. 34 p.
7. Philip Yarrow. Squash. Steps to Success. London, 2009. 256 p.
8. Pippa Sales. Improve your squash game: 101 Drills, Coaching tips and Resources. Pippa Sales. 1996. 12 p.
9. Tony Griffin. The G sport. A book about squash. 2014. 24 p.

References

1. Belits-Heiman, S. P. (1971). *Iskusstvo tennisa [The art of tennis]*. M.: Fizkultura i sport, 255.
2. Bondarchuk, A. P. (2005). *Periodizatsiia sportivnoi trenirovki [Periodization of sports training]*. K.: Olympiiskaia literatura, 304.
3. Hodik, M. A. & Skorodumova, A. P. (2010). *Kompleksnyi kontrol v sportyvnykh ihrakh [Integrated control in sports games]*. M.: Sovetskii sport, 336.
4. Proskuriakova, N. Yu. (2003). *Fizicheskaia podhotovka yunykh tennisistov na etape nachalnoho obucheniia [Physical training of young tennis players at the stage of primary education]*. RHUFK. M., 78.
5. Ian, McKenzie (2002). *Squash Skills by Ian McKenzie's*. London, 324.
6. Peter, A. Hirst (2011). *Squash: Skills. Techniques. Tactics*, 34.
7. Philip, Yarrow (2009). *Squash. Steps to Success*. London, 256.
8. Pippa, Sales (1996). *Improve your squash game: 101 Drills, Coaching tips and Resources*. 12.
9. Tony, Griffin (2014). *The G sport. A book about squash*. 24.

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