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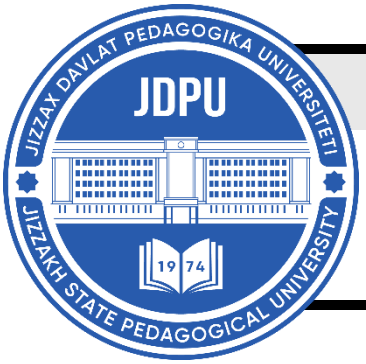


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# METHODOLOGY FOR DEVELOPING THE PHYSICAL FITNESS OF FEMALE STUDENT BASKETBALL PLAYERS

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## ABOUT ARTICLE

**Key words:** Training sessions, competition period, functional fitness, physical fitness, technical-tactical preparation, psychological readiness, factor, means, method, analysis.

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**Abstract:** This article substantiates the effectiveness of a pedagogical approach for developing the physical fitness of female student basketball players. The study is based on a comparative analysis of results achieved through the application of a special block of exercises within the annual training sessions, using a systematic, specialty-specific approach.

**Introduction.** Relevance of the Study. One of the main reasons for the insufficient attention to organizing the physical fitness of female student basketball players during annual training sessions, as well as maintaining it steadily during the competition period, is the almost complete disregard for the factors influencing these processes [1, 6].

Studying and analyzing the factors affecting the physical fitness of female student basketball players allows for the maximal demonstration of athletes' readiness during competition cycles and provides broad opportunities for maintaining their physical fitness consistently. The review and analysis of scientific and methodological literature on the topic revealed that data on the physical fitness of female student basketball players are generally presented in a broad or general form [2, 7].

When the physical fitness of female student basketball players is high, athletes can effectively demonstrate the results of their physical, technical, and tactical skills in practice [4].

During annual training sessions, it is necessary to study and analyze the factors affecting their physical fitness, systematically organize them, develop effective ways to eliminate negative aspects, and apply these methods in training [3, 5].

Purpose of the Study. To study and analyze the physical fitness of female student basketball players and explore ways to improve it during annual training sessions through a survey questionnaire.

Research Objectives:

- To study and analyze scientific and methodological literature on factors affecting the physical fitness of female student basketball players;
- To apply a special block of exercises within annual training sessions based on a systematic, specialty-specific approach to develop the physical fitness of female student basketball players, and to justify its effectiveness.

Research Methods:

Pedagogical observation, theoretical analysis and generalization, experimental methods, and mathematical-statistical techniques were employed.

Research Results and Discussion:

Improving the physical fitness of female student basketball players during annual training sessions plays a crucial role in achieving high sports results. The duration and structure of training are influenced by many factors, including the specific characteristics of the sport, the fundamental principles forming sports skills, the athlete's individual adaptive capacities, the structure of training, and the content of exercises performed.

To enhance both general and sport-specific physical fitness of female student basketball players, a block of exercises focused on developing speed, agility, and speed-strength qualities was applied in a multidisciplinary, tiered manner (progressively from simple to complex). This approach allowed athletes to maintain game intensity steadily during competitions and improved their performance outcomes.

Based on the aim of this study, a pedagogical experiment was conducted to justify the effectiveness of our methodology, which involves the application of tiered exercises designed to enhance the physical fitness of female student basketball players during training sessions.

The pedagogical experiment was conducted during the training sessions of female basketball players. Participants (n=24) were divided into two groups: the experimental group ("EG") and the control group ("CG"). Each group included 12 players. The training sessions for the control group were conducted in the traditional manner without any changes, whereas the experimental group followed a methodology developed by us.

Initially, using established criteria, the physical fitness levels of the basketball players were assessed. Subsequently, training sessions were conducted for each group based on our methodology, taking into account the physical fitness level of each player.

To comprehensively evaluate the physical fitness of the basketball players, the following control tests were used: running 60 m, running 3x10 m, and push-ups from the floor. To assess sport-specific physical fitness, the following control tests were applied: shooting the ball into the basket while dribbling in a zig-zag pattern (number of shots), shooting the basketball into the basket (number of shots), and running 3x10 m shuttle sprints (seconds).

**Table 2**

**Statistical Analysis of Physical Fitness Indicators of Female Basketball Players at the Beginning of the Pedagogical Study (n=24)**

| No. | Control Tests | Experimental Group (n=12) (mean ± SD) | Control Group (n=12) (mean ± SD) | t | P |
|---|---|---|---|---|---|
| **General Physical Fitness (GPF)** | 60 m sprint (seconds) | 10.2 ± 0.7 | 10.1 ± 0.6 | 1.3 | >0.05 |
| | Throwing 500 g medicine ball (m) | 16 ± 4 | 15 ± 5 | 1.2 | >0.05 |
| | Push-ups from the floor (repetitions) | 6 ± 2 | 6 ± 2 | 1.5 | >0.05 |
| **Special Physical Fitness (SPF)** | Shooting into the basket while dribbling in a zig-zag pattern (repetitions) | 2 ± 1 | 2 ± 1 | 1.4 | >0.05 |
| | Basketball shots into the basket (repetitions) | 3.4 ± 2 | 3.6 ± 2 | 0.9 | >0.05 |
| | 3x10 m shuttle run (seconds) | 9.8 ± 0.9 | 9.7 ± 0.8 | 0.5 | >0.05 |

According to the normative criteria for physical fitness, at the beginning of the study, 12 female basketball players in the 60 m sprint test recorded 10.2 ± 0.7 s in the experimental group and 10.1 ± 0.6 s in the control group, with statistical differences $t = 1.3$; $P > 0.05$. No significant differences were observed between the experimental and control groups.

In the 500 g medicine ball throw test, the normative criteria at the start of the study showed results of 16 ± 4 m for the experimental group and 15 ± 5 m for the control group, with statistical differences $t = 1.2$; $P > 0.05$. The differences between the groups were statistically insignificant.

In the push-ups from the floor test, 12 basketball players in the experimental group performed 6 ± 2 repetitions, and the control group also performed 6 ± 2 repetitions, with statistical differences $t = 1.5$; $P > 0.05$. No significant differences were observed between the groups. These results indicate that at the start of the study, there were no reliable differences in general physical fitness among the basketball players.

Regarding sport-specific physical fitness, in the test of shooting into the basket while dribbling in a zig-zag pattern, the experimental group achieved 2 ± 1 repetitions and the control group also achieved 2 ± 1 repetitions, with statistical differences t = 0.9; P > 0.05, indicating no significant differences.

In the basketball shooting test, the experimental group scored 3.4 ± 2 repetitions, and the control group 3.6 ± 2 repetitions, with t = 0.5; P > 0.05, showing no significant differences.

In the 3x10 m shuttle run test, the experimental group recorded 9.8 ± 0.9 s and the control group 9.7 ± 0.8 s, with t = 0.5; P > 0.05. No significant differences were observed between the experimental and control groups.

Based on these initial test results, educational materials were developed and incorporated into the training process to improve the physical fitness of female student basketball players (see Figure 1 and Table 1).

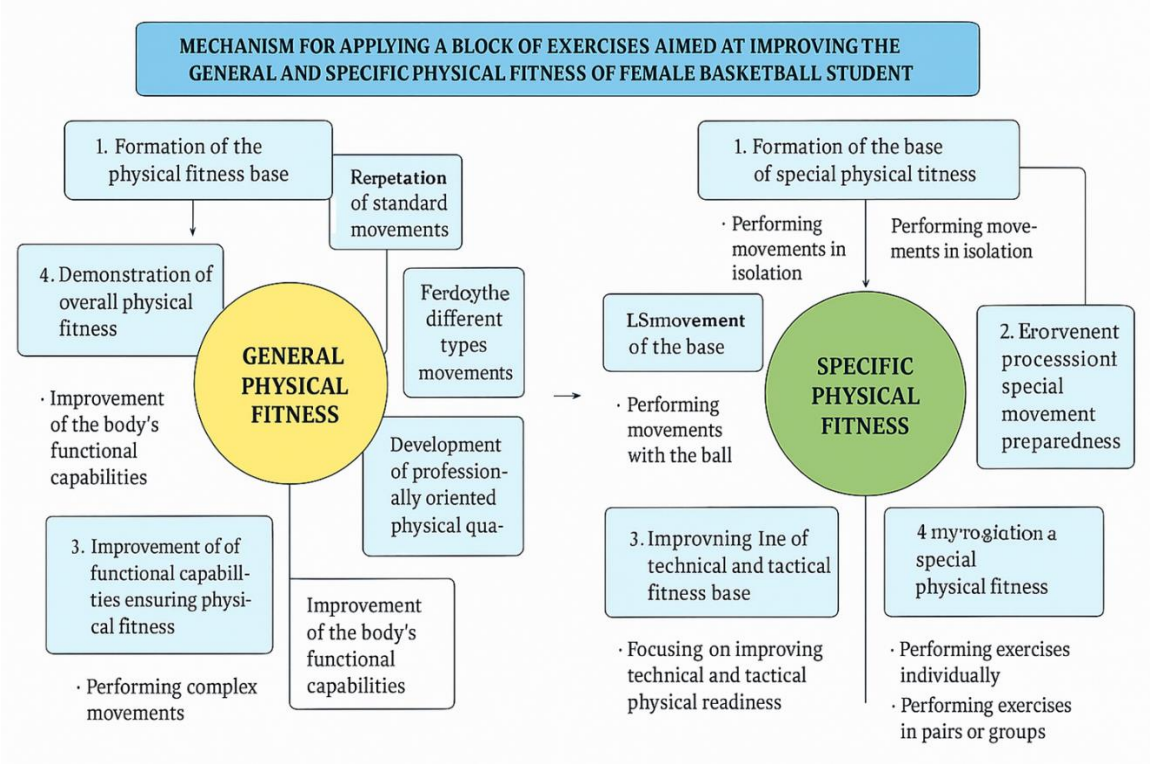


**Figure 1 / Table 1. Exercise Block for Enhancing General and Sport-Specific Physical Fitness of Female Student Basketball Players**

| Block | Exercise | Repetitions / Duration | Rest Interval | Organizational & Methodological Guidelines |
|---|---|---|---|---|
| **General Physical Fitness Base** | Running in place (speed) – torso upright, feet shoulder-width, knees lifted alternately | 30–45 s | 30 s | Keep torso upright, arms actively moving |

| Block | Exercise | Repetitions / Duration | Rest Interval | Organizational & Methodological Guidelines |
|---|---|---|---|---|
| | Elbow plank – elbows under shoulders, forearms forward, legs slightly apart, toes on floor | 3 × 30 s | 30–60 s | Tighten abdominal muscles |
| | Squat jumps – feet shoulder-width, hands at sides or chest, knees quickly straighten, jump upward | 3 × 10–12 reps | 45 s | Soft landing, knees slightly bent |
| | Running with ball – torso slightly forward, knees slightly bent, eyes on ball | 3 × 20–30 m | 60 s | Keep head up, control ball |
| | Run-stop (start-stop) – develop ability to stop and resume motion quickly | 4–6 × 10–15 m | 45 s | Strong start, abrupt stop |
| **Functional Fitness Base** | Lateral running – lower body posture low, knees bent, torso slightly forward, arms ready | 4 × 15–20 m | 30 s | Speed in lateral movements |
| | High-knee running in place – torso upright, arms bent ~90°, close to body | 3 × 30 s | 30 s | Quick stops, turns, jumps, fast decision-making |
| | Jumping step change – one leg forward, other back, knees slightly bent, arms parallel | 3 × 10 reps per leg | 45 s | Maintain balanced stance, back straight |
| | Forward-back stretch lying with basketball | 3 × 15 reps | 30 s | Correct breathing, maintain posture, focus on quality |
| | Side twists with basketball | 3 × 20 (10 per side) | 30 s | Prepare lateral muscles, torso rotation |
| **Sport-Specific Physical Fitness** | **Speed Development** | | | |
| | Short-distance sprint (10–20 m) – explosive start, torso forward | 5–6 reps | 30–40 s | Front foot on line, back foot slightly behind |
| | Zig-zag running – 5–6 obstacles | 4–5 reps | 1 min | Perform as fast as possible |
| | Reaction drill (signal-based sprint) | 8–10 reps | 20–30 s per signal | Sprint on coach's signal |
| **Jumping Ability** | Vertical jump (both feet) | 3 × 10 reps | 1 min per set | Jump with arm assistance |
| | Step-by-step jump (onto bench) | 3 × 8–10 reps | 1–1.5 min | Alternate legs |
| | Running jump (near hoop) | 4 × 6–8 reps | 1 min | Continuous running into jump |
| **Strength / Overall Body** | Plank (static hold) | 3 × 30–45 s | 30 s | Torso straight, abdomen tight |
| | Push-ups from floor | 3 × 10–12 reps | 1 min | Bend elbows backward, do not fully extend |
| | Abdominal crunch | 3 × 15–20 reps | 1 min | Lift shoulders without touching floor |

Note: Exercises are organized in a progressive order to develop general physical fitness, functional fitness, and sport-specific qualities including speed, agility, strength, and jumping ability.

The structural components of the mechanism for applying the exercise block aimed at improving the general and sport-specific physical fitness of female student basketball players are as follows:

1. General physical fitness.
2. Sport-specific physical fitness.

General physical fitness is divided into the following components:

1. Formation of the physical fitness base – includes tasks such as standard repetition of movements and repeating movements at different speeds.
2. Development of sport-specific physical qualities – includes tasks for developing the main physical qualities as well as combined physical qualities.
3. Enhancement of functional capabilities supporting physical fitness – includes tasks aimed at improving the respiratory system (RS) and cardiovascular system (CVS) capabilities.
4. Comprehensive demonstration of general physical fitness – includes performing both simple and complex movements.

Sport-specific physical fitness is divided into the following components:

1. Formation of the sport-specific physical fitness base – includes tasks involving segmented and holistic execution of movements.
2. Enhancement of sport-specific movement preparedness – includes exercises performed with and without the ball.
3. Development of sport-specific physical fitness aimed at technical preparedness – includes performing in standard and non-standard situations.
4. Comprehensive demonstration of sport-specific physical fitness – includes exercises performed individually and with a partner.

As a result of this mechanism, if the training process is organized based on the model of the exercise block aimed at improving the general and sport-specific physical fitness of female student basketball players, athletes will be able to perform technically and tactically correct movements reliably under various complex conditions arising during training and competition, thereby contributing to successful outcomes in matches.

**Table 3. Statistical Analysis of Physical Fitness Indicators of Female Student Basketball Players at the End of the Pedagogical Study (n=24)**

| T/r | Control Tests | Experimental Group (n=12) | Control Group (n=12) | t | P |
|---|---|---|---|---|---|
| GPF | 60 m run (s) | 9.2±0.5 | 9.7±0.4 | 2.5 | <0.05 |
| | 500 g grenade throw (m) | 19.4±3 | 19.8±4 | 2.3 | <0.05 |

| T/r | Control Tests | Experimental Group (n=12) | Control Group (n=12) | t | P |
|---|---|---|---|---|---|
| | Push-ups from floor (reps) | 8.6±2 | 9.1±2 | 2.4 | <0.05 |
| SPF | Zig-zag dribble to basket (reps) | 5.3±1 | 6.2±3 | 2.2 | <0.05 |
| | Basketball shot to basket (reps) | 4.6±1 | 4.7±3 | 2.3 | <0.05 |
| | 3 × 10 m shuttle run (s) | 9.2±0.9 | 9.5±0.8 | 2.8 | <0.05 |

*Note: GPF – General Physical Fitness; SPF – Sport-Specific Physical Fitness*

**Normative Requirements for Physical Fitness at the End of the Study**

At the end of the study, the 60 m running test for 12 female student basketball players showed that the experimental group completed it in 9.2±0.5 s, while the control group completed it in 9.7±0.4 s, with statistical differences of t=2.3; P<0.05. This indicates a reliable difference between the experimental and control groups.

For the 500 g grenade throw test, the experimental group achieved 19.4±3 m, and the control group achieved 19.8±4 m, with statistical differences of t=2.4; P<0.05, showing a significant increase in differences between the groups.

In the push-up test from the floor, the experimental group performed 8.6±2 repetitions, while the control group performed 9.1±2 repetitions, with t=2.4; P<0.05, indicating reliable differences between the groups. These results demonstrate that, by the end of the study, the general physical fitness of the female student basketball players had significantly improved, as confirmed by mathematical-statistical methods.

For sport-specific physical fitness, in the zig-zag dribble to basket test, the experimental group achieved 5.3±1 repetitions and the control group 6.2±1 repetitions, with statistical differences of t=3.4; P<0.01, indicating significant differences between the groups.

In the basketball shot to basket test, the experimental group achieved 4.6±1 repetitions, while the control group achieved 4.7±3 repetitions, with statistical differences of t=2.3; P<0.05, confirming reliable differences between the groups.

In the 3×10 m shuttle run, the experimental group completed it in 9.2±0.9 s, and the control group in 9.5±0.8 s, with t=2.8; P<0.05, confirming reliable differences between the groups.

The analysis of these results indicates that the use of these training materials in the preparation process is an effective pedagogical approach and demonstrates reliability in improving performance.

**Conclusions.** Analysis of the scientific-methodical literature revealed that no separate studies have been conducted specifically on the factors affecting the maintenance of female student basketball players' physical fitness during the competition periods of the annual training cycle.

The results of this study, analyzed using mathematical-statistical methods, confirm that investigating and analyzing the factors influencing the maintenance of physical fitness during the competitive phase of annual training allows coaches to prevent and mitigate their negative impact, thereby ensuring effective training. Taking into account the characteristics of the sport and the individual abilities of athletes contributes to achieving high sporting results.

**References:**


1. A.A.Pulatov., F.V.Ganiyeva., B.M.Miradilov., D.T.Xusanova., F.A.Pulatov. Basketbol nazariyasi va uslubiyati. Darslik. Sano-standart. T.:-2017. 348 b.

2. Axmedov A.X., Jumayev R.R. Sport mashg‘ulotlari nazariyasi va metodikasi. – T.: 2019. –B.26-27.

3. Kafarov R. "Jismoniy tarbiya va sport mashg‘ulotlarini tashkil etish", Toshkent, 2020. –B.77-28.

4. Bompa T., Carrera M. Periodization Training for Sports, Human Kinetics, 2005. – pp.12-17.

5. Платонов В.Н. Система подготовки спортсменов в олимпийском спорте, М.: Физкультура и спорт, 2013. –С.96-97.

6. Ўзбекистон Республикаси Олий ва ўрта махсус таълим вазирлиги. “Basketbol darslarini o‘qitish metodikasi”. O‘quv qo‘llanma, Toshkent, 2021. –B.31-32.

7. Kurbonova N.S. Jismoniy tarbiyaning nazariy asoslari. “O‘zbek-kitobsavdo-nashriyot” NMIU. O‘quv qo‘llanma. T.,-2020. 108 b.