



MODERN APPROACHES FOR THE PHYSICAL TRAINING OF YOUNG FEMALE BASKETBALL PLAYERS

Oksana Komotska^{1ABCDE} and Ruslana Sushko^{1ABCDE}

¹Borys Grinchenko Kyiv University

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Corresponding Author: Ruslana Sushko, E-mail: r.sushko@kubg.edu.ua

Accepted for Publication: May 19, 2022

Published: June 25, 2022

DOI: 10.17309/tmfv.2022.2.17

Abstract

The study purpose was to substantiate, develop and test the effectiveness of the author's program for physical training of young female basketball players in the pre-competition period of the macrocycle preparatory stage, and to experimentally test its effectiveness.

Materials and methods. The subjects were 15 young female basketball players born in 2007-2008, third year of study (1st year of study in the basic training group), members of the All-Ukrainian Youth Basketball League (AUYBL), who participated in the experimental program to improve their physical fitness. Three tests on six indicators of physical fitness were conducted. The results of a consecutive experiment for young basketball players during their training in the camp were analyzed and interpreted.

Results. The author's program for physical training of young female basketball players was developed and implemented during the training camp in order to increase their level of physical fitness and preparation for participation in the AUYBL competitions. The results of the study, which were obtained during a series of experiments, allowed to examine and analyze six indicators of physical fitness, and to substantiate the effectiveness of modern approaches to physical training of young female basketball players in the pre-competition period of the macrocycle preparatory stage. They were based on the minimization of additional workload and focused concentration of female athletes on the quality of specific exercises in a limited period.

Conclusions. The analysis of the results, the indicators of physical fitness of young female basketball players, allows to state that the use of the author's program for physical training makes it possible to record the improvement of physical fitness on tests that have speed-strength and strength orientation, namely: high jump, long jump, run for 40 s, flexion-extension of the arms at thrust lying for 30 s. According to the indicators of speed tests (20 m run and 60 m sprint), no statistically significant differences were recorded, with a tendency to their improvement.

Keywords: basketball, program, physical training, physical fitness, training camp.

Introduction

Competitiveness of national basketball teams (national, youth, junior, and cadet) at the international level is due to the presence of an effective process for training (theoretical, technical, tactical, psychological, physical, and integral) at all stages of long-term improvement (Pluta & Andrzejewski, 2018; Teck, Wang, & Mallett, 2012). The final unresolved complex issues of the correlation between general and special physical training, taking into account the role and age characteristics of players, indicates the possibility of improvement in this area, which is emphasized by the publications of influential scientists (Villa & Lozano, 2018; Koryahin, Blavt,

& Ponomaryov, 2019). The motivational orientation of physical training taking into account the basketball players' psychotype, their leading representative system (audio, visual, and kinaesthetic) are substantiated with the experimental research of specialists. The issues of diagnosis of psychological sex, determination of sexual dominance of the individual (androgyny, muscularity and femininity) taking into account the level of psychophysiological stress in competitive activities are the matter of importance too (Sushko et al., 2019).

Coaching approaches to technical and tactical training based on morph functional specialization of the body, which is a necessary prerequisite for physical training of athletes, are noted to be effective (Tyshchenko et al., 2018; Doroshenko et al., 2019; Koryahin et al., 2018; Oliinyk et al., 2021).

The exploring of the possibilities of theoretical training and a significant contribution to the effectiveness of the

training process through the immersion of athletes in a thorough understanding of the methodology and selection of effective tools are proven by specialists studying this subject (Bohuslavskaya et al., 2020). Professional scientific discussion is more focused on different attitudes to integrated training, the basis of which is physical training that requires strategically new approaches, generalization and systematization of experimental results (Chucha et al., 2020). The issues of athletes' recovery and stimulation of their working capacity in various structural components of the macrocycle remain promising for further implementation (Mustafa Asaad Munsheed Al-Fartusi, & Sushko, 2015; Scanlan et al., 2018). However, the current level of physical fitness of players is the priority for influence on the result of the match at the present stage of basketball development. It allows in specific conditions of competitive activity and highly competitive struggle to effectively realize the available technical and tactical potential of athletes (Ricardo Ferraz et al., 2021). These characteristics are not the exclusive advantage of professional players, but relate to the problematic issues of physical training at all stages of sports improvement of basketball players (Cieslicka et al., 2019). From this perspective, the normative indexes of indicators of physical fitness in the curricula of children's and youth sports schools have reduced informativeness due to the heterochrony of physical development of young basketball players. This indirectly affects the level of young basketball players' motor skills development and performance indicators of their competitive activities. Increasing the volume and intensity of physical activity at a young age leads to a temporary improvement in performance, but with further negative consequences for both integrated fitness and the health of athletes (Platonov & Bolshakova, 2013; Koryahin, Blavt, & Ponomaryov, 2019).

Thus, modern methodological approaches to physical training of young basketball players should be formed taking into account the following factors: determining the optimal ratio of general and special exercises in physical training, individualization of training based on the pace of physical development and the formation of positive emotional background during training.

This study presents the author's program of physical training for girls born in 2007 during their training in a camp, which aims to predominantly develop the motor skills of young female basketball players in the pre-competition period of the macrocycle's preparatory stage for quality preparation for the All-Ukrainian Youth Basketball League (AUYBL).

Hypothesis. Directed use of special exercises in the limited period of the preparatory process would help to increase the level of physical fitness of young female basketball players.

The study purpose was to substantiate, develop and test the effectiveness of the author's program of physical training of young female basketball players in the pre-competition period of the macrocycle's preparatory stage, and to experimentally test its effectiveness.

Materials and methods

Study participants

15 young female basketball players born in 2007-2008, third year of study (1st year of study in the basic training

group), members of the All-Ukrainian Youth Basketball League (AUYBL), took part in the experimental program to improve physical fitness.

Study organization

Experimental research was conducted on August 16-30, 2020 in Bar (Ukraine) during the training camp of young female basketball players born in 2007-2008 with the implementation of the author's physical training program for further participation in the All-Ukrainian Youth Basketball League with the Basketball Federation of Ukraine's patronage.

The author's program of physical training is implemented and the pedagogical testing on six indicators according to the curriculum for children's and youth sports school, sports children's and youth school of the Olympic reserve, school of higher sporting skills and specialized educational institutions in a sports field (Poplavsky et al., 2019) is carried out, the received results of an interpreted experiment are analyzed.

The implementation of the author's program involved three stages of control through comparative analysis of the results of testing the level of physical fitness. 16.08.2020 – the first stage (control and diagnostic), before starting the program implementation; 29.08.2020 – the second stage (control and analytical), after the implementation of the program; 14.09.2020 – the third stage (control-comparative), to check the delayed effect of the implementation of the physical training program. All participants and their parents gave informed consent to participate in a pedagogical experiment in accordance with the bioethical standards of the Helsinki Declaration of the World Medical Association "Ethical principles of medical research with human participation as an object of study" (latest version 1.10.2008 Helsinki Declaration, 2008).

Tests and their organizational and methodological guidelines are presented below:

1. 20 m run, s

It is recommended to run the 20 m distance at maximum speed without stopping at the finish line.

2. Jumping height, cm

First, the player's point is fixed with the raised hand up standing in a profile at the wall. The jump is performed in a convenient position for the player near the wall (face, side). The second point is fixed after the player jumps out vertically upwards as high as possible. The difference between the indicators is the height of the player's jump. The best result of three attempts is scored.

3. Long jump, cm

The point of the maximum long jump is fixed from the defined line; the measurement is registered on the player's heels. The best result of three attempts is scored.

4. Run for 40 c, m

The player expects his own strength to move for 40 s (running face forward) from one to another front line of the basketball court, trying to overcome a greater distance as possible, which is scored as the result. After the whistle, the player must stop to count the distance.

5. 60 m sprint, s

It is recommended to run the 60 m distance at maximum speed, without stopping at the finish line.

6. Flexion-extension of the arms at thrust lying for 30 s.

The number of flexions / extensions of the arms performed at a flat torso position and the maximum possible bending angle is scored.

Table 1. Indicative indicators of the effectiveness of tests to determine the level of physical fitness according to the children's and youth sports school's curriculum (basic training, 1st year of study, girls)

Value	Test number / Result					
	1, s	2, cm	3, cm	4, m	5, s	6, qty
satisfactory	4.1-4.3	35-41	160-174	172-175	9.6-10.1	10
good	3.6-4.0	42-46	175-189	175-181	8.9-9.5	11
excellent	3.5	47	190	182	8.8	12

Notes: 1 – 20 m run, s; 2 – Jumping height, cm; 3 – Long jump, cm; 4 – Run for 40 s, m; 5 – 60 m sprint, s; 6 – Flexion-extension of the arms at thrust lying for 30 s, qty.

The team of young female basketball players born in 2007-2008 from Kyiv sports children's and youth school of the Olympic reserve in basketball took the 4th place in the championship of the AUYBL season 2019/2020. The desire to improve the result in the next game season has led to the combined efforts of the scientific group and coaching staff to improve approaches to physical, technical, tactical and psychological training of young female basketball players.

The planned work provided a comprehensive interaction in the training process during the preparatory and competitive periods with the use of modern approaches to coaching and taking into account the proposals of the scientific group on load correction. The experiment is based not on the novelty of exercises and increasing the volume and intensity of loads, but modern coaching approaches to achieving quality performance of simple exercises by maximizing the specification of tasks and specifying the requirements for their implementation.

The selected tests and the author's program provided for the identification of informative indicators and further targeted work to improve the speed and strength qualities of female players. The set of exercises of the program does not contain a direct repetition of test exercises.

The first joint work was implemented during the training camp for physical training of young female basketball players. It is worth noting that before the first test, the young athletes

spent two weeks of a macrocycle after a long rest. The second test was made immediately after the end of the training camp with the use of the author's program to improve physical fitness, the third test required to identify the delayed effect of the work.

After the first testing, an experimental program for improving physical fitness was implemented into the training process of young female basketball players, which consisted of performing special exercises, which are additionally designed for 15-20 minutes of work after each training session. The program has three blocks, each of which consists of seven training sessions.

Statistical analysis

The obtained informative data of experimental researches were processed by descriptive statistics. Methods of the parametric statistics (the arithmetic mean value, standard deviation) were used in the study due to the fact that samples of testing results of the level of physical fitness of young female basketball players born in 2007-2008 complied with the law of normal distribution (verified by the Shapiro-Wilk index).

The statistical significance of the difference between the indicators of testing the level of physical fitness of young female basketball players by dates, namely 16.08.2020, 29.08.2020, 14.09.2020, was determined using the Student's criterion for paired samples (Vincent, 2005; Lang, Altman, 2013; Alexandropoulos et al., 2019).

Mathematical and statistical processing and analysis of data were performed using the computational and graphical capabilities of such software program, as Statistica (StatSoft, version 10.0) and Microsoft Excel 2010.

Results

Analysis of indicators of physical fitness, presented in table 2, allows to state that during the training camp (16.08.2020 – 29.08.2020), the use of the author's program of physical training resulted in improving of physical fitness on tests that have speed-strength and strength orientation, namely:

- Jumping height, 37+3 cm (16.08.2020) and 38+2 cm (29.08.2020) accordingly; differences are statistically significant at the level, $p < 0.001$;
- Long jump, 181+23 cm (16.08.2020) and 184+20 cm (29.08.2020) accordingly; differences are statistically significant at the level, $p < 0.01$;

Table 2. Dynamics of results of testing the level of physical fitness of young female basketball players born in 2007-2008

No	Test	Date of the test				29.08.2020 vs		Date of the test		14.09.2020 vs	
		16.08.2020		29.08.2020		16.08.2020		14.09.2020		29.08.2020	
		X	S	X	S	t	p	X	S	t	p
1	20 m run, s	3.89	0.13	3.86	0.13	2.09	0.055	3.83	0.12	2.80	0.014
2	Jumping height, cm	37	3	38	2	4.01	0.001	39	2	1.78	0.096
3	Long jump, cm	181	23	184	20	3.09	0.008	188	15	2.36	0.033
4	Run for 40 s, m	176	9	180	6	5.08	0.001	181	5	4.73	0.001
5	60 m sprint, s	9.59	0.47	9.51	0.41	1.47	0.165	9.36	0.42	4.55	0.001
6	Flexion-extension of the arms at thrust lying for 30 s, qty	13.8	2.3	15.3	1.4	3.77	0.002	16.3	1.5	4.30	0.001

EXPERIMENTAL PROGRAM
for improving physical fitness of young female basketball players
(21 training sessions)

Block I (7 training sessions)

No	Content	Dosage	Organization and methodology of the exercise
1	Lifting and lowering on toes (stairs, bench)	3 sets of 15-20 times on each leg	the pace is dynamic, but not fast; the maximum amplitude is important
2	Steppe on the spot + steppe across the line + 6 m acceleration	3 sets of 10 s + 10 s	arms up, elbows bent – 90° angle
3	Jumping rope on two legs	3 sets of 100 times	jumps due to elastic repulsion of the feet, the heel does not touch the floor, the knees are almost straight
4	Running on the spot with a high rise of the thigh	3 sets of 10 s	performance with the maximum frequency and amplitude, special concentration on the arm movements speed
5	Plank in the supine position	3 sets of 15 s	arms bent at the elbows, armrests at the expense of elbows and palms

Block II (7 training sessions)

No	Content	Dosage	Organization and methodology of the exercise
1	Lifting and lowering on toes (stairs, bench)	3 sets of 15-20 times on each leg	the pace is dynamic, the amplitude is maximum
2	Steppe on the spot + jumping line with both feet back and forth + 6 m acceleration	3 sets of 10 s + 10 s	arms up, elbows bent – 90° angle
3	Jumping rope on two legs	3 sets of 100 times	jumping as fast as possible with an emphasis on the minimum time for repulsion
4	Running on the spot against the wall	3 sets of 15 s	maximum speed, emphasis on the height of the knee
5	Plank in the supine position	3 sets of 20 s	arms bent at the elbows, armrests at the expense of elbows and palms

Block III (7 training sessions)

No	Content	Dosage	Organization and methodology of the exercise
1	Lifting and lowering on toes (stairs, bench)	3 sets of 15-20 times on each leg	the pace and amplitude are maximum
2	Steppe on the spot + steppe running on the bench + 6 m acceleration	3 sets of 10 s + 10 s	arms up, elbows bent – 90° angle
3	Jumping rope on two legs	3 sets of 100 times	jumping as fast as possible with an emphasis on the minimum time for repulsion
4	6 m starting acceleration	5 times	it is important to perform with maximum concentration and powerful repulsion
5	Plank in the supine position	3 sets of 30 s	arms bent at the elbows, armrests at the expense of elbows and palms

- Run for 40 s, 176+9 m (16.08.2020) and 180+6 m (29.08.2020) accordingly; differences are statistically significant at the level, $p < 0.01$;
- Flexion-extension of the arms at thrust lying for 30 s, 13.8+2.3 (16.08.2020) and 15.3+1.4 (29.08.2020) accordingly; differences are statistically significant at the level, $p < 0.001$.

According to the indicators of speed tests (20 m run and 60 m sprint) no statistically significant differences were recorded, with a tendency to improve the indicators of physical fitness of speed orientation:

- 20 m run, 3.89+0.13 (16.08.2020) and 3.86+0.13 (29.08.2020) accordingly;

- 60 m sprint, 9.59+0.47 (16.08.2020) and 9.51+0.41 (29.08.2020) accordingly.

Experimental studies of the level of physical fitness of young female basketball players also included checking the presence of the delayed effect of the author's program of physical training.

A comparative analysis of the indicators of physical fitness of young female basketball players after the training camp (29.08.2020) and two weeks later (14.09.2020) shows (see Table 1) that the results of tests of speed-power, speed and power orientation are statistically significant differences – higher indexes were recorded in the tests conducted after the training camp and two underlying microcycles

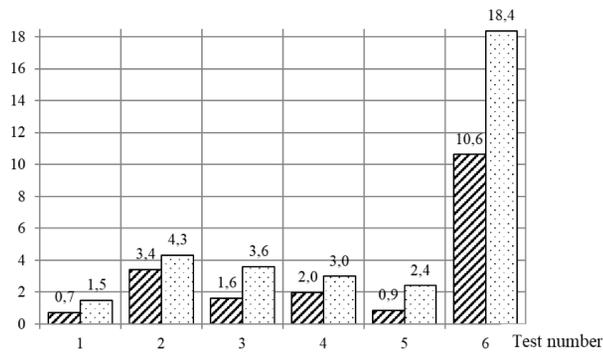


Fig. 1. Dynamics of test results of young female basketball players, % by the dates:

■ - 29.08.20 vs 16.08.20; □ - 14.09.20 vs 29.08.20

(14.09.2020). Exceptions are the results of testing the Jumping height 38+2 cm (29.08.2020) and 39+2 cm (14.09.2020), accordingly, while maintaining the general trend to improve the physical fitness of young female basketball players based on the accumulation of delayed effect during the next two consecutive underlying microcycles.

Figure 1 shows the dynamic characteristics of testing the level of physical fitness of young female basketball players after the implementation of the author's program of physical training.

To visually compare the results of testing the physical fitness of young female basketball players in the dynamics (according to the exercises shown in Table 1), which have different units of measurement, the data are scaled so that they fall into a specific interval (see Fig. 2).

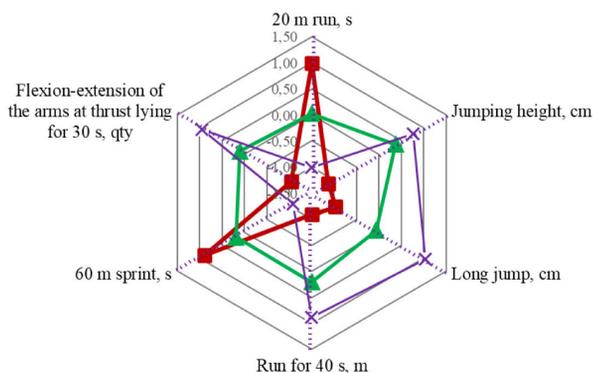


Fig. 2. Dynamics of test results (standardized indexes) of young female basketball players by the dates:

■ - 16.08.20 ▲ - 29.08.20 × - 14.09.20

It is recommended to use this operation for processing certain comparison indicators and their evaluation in order to remove data limits and turn them into dimensionless universal value. Thus, different, according to the scales of the test results, you can compare the results in different units or indexes. The most typical, in this context, is the standardization of data; precisely their equal distribution is reflected in the range (0,1).

In the process of mathematical and statistical processing of experimental results, standardization includes the trans-

formation of data by subtracting each value from a reference value (usually the average value of the sample) and dividing it by the standard deviation (usually sample SD). When applied to inputs, standardization makes the results of various statistical methods completely independent of ranges of values or units of measurement. This procedure allows to unify the values of indicators (regardless of their distribution and initial units of measurement) to compatible units of distribution with an average value of 0 and a standard deviation of 1. This procedure has a wide range of applications in the processes of mathematical and statistical processing of indicators, as it provides a distribution of values that can be used in the process of comparative analysis of experimental parameters in the dynamics of the preparation process.

Discussion

The basis for crucial issues of the study is the hypothesis of the possibility of targeted use of special exercises in a limited time of the preparatory process of young female basketball players in order to increase their level of physical fitness. The substantiation of such possibility is based on the analysis and systematization of scientific literature, personal pedagogical observations and authors' pedagogical experience. The results of experimental research allow us to state that the targeted use of special exercises in the limited period of the preparatory process helps to increase the level of physical fitness of young female basketball players, and the hypothesis is true.

Certain positions of scientific novelty have been defined in the process of elaboration and systematization of the obtained results of experimental researches. For the first time, the possibility of improving the physical fitness of young female basketball players based on the targeted use of special exercises in the limited period of the preparatory process has been proven in contrast to current theoretical and methodological provisions on the development of motor skills in basketball, which do not specify their timing (Koryahin et al., 2018, 2020; Doroshenko et al., 2019).

In other studies, the chronological limits of the use of special exercises are determined, but without taking into account the structural period of the macrocycle of training – the micro- or mesocycles of training, training camps. In particular, 6-week programs of plyometric training are considered by Gokmen Ozen, Ozdemir Atar, and Hurmuz Koc (2020) to be effective for young basketball players' physical abilities. This thesis also applies to a study (Tuan Tran Minh & Cuong Tran Ngoc, 2022), which identified the effects of a 15-week club-based basketball training program for the integrated development of physical and technical-tactical abilities without limiting the use of special exercises.

Also, for the first time, the possibility of using the author's training program in the preparatory process of young female basketball players as an integral part of preparation for the official national competitions – the All-Ukrainian Youth Basketball League games – has been proven. At the same time, the study (Doroshenko et al., 2020) emphasizes that training programs in the preparatory process of young female basketball players, which are aimed at intensifying their training, can negatively affect the integrated training of athletes in the subsequent stages of sports improvement – the stage of preparation for higher sporting achievements, the stage of maximum realization of individual capabilities, etc.

However, the thesis of the short-term positive effect of training programs on the level of physical fitness of young female basketball players is not denied (Platonov & Bolshakova, 2013), which, in our opinion, makes it possible to use such programs, although with some caution - no often than 1-2 times per macrocycle training.

Besides, the data on the development and improvement of young female basketball players' physical abilities in the preparatory period of the macrocycle were supplemented based on the results of the study. At the theoretical level, the results of scientific research (Platonov, 2017) on the development of leading physical qualities of female athletes in team sports games (speed-power and special endurance) and their implementation in the process of long-term improvement were deepened. At the methodological level, the scientific results (Ricardo Ferraz et al., 2021) have been supplemented, regarding the effect of similar training programs on the indicators of integrated basketball players, including the accuracy of throwing the ball into the basket.

The dialectical issues of improving the physical fitness of young female basketball players, namely, their early game specialization, have also been supplemented. Onishchenko and Mitova (2015) emphasized that the factors of heterochrony of physical development and the current level of physical capabilities are important in the problematic issues of early game specialization of young female basketball players. At the same time, without taking into account prognostic markers in the process of physical training, early specialization significantly reduces the competitiveness of young female basketball players in the subsequent stages of sports improvement due to reduced performance and tactical experience in other (adjacent) positions (Kozina et al., 2017; Chucha et al., 2020).

A group of data of scientific novelty and the further development of theoretical and methodological provisions has been also identified while processing the results of experimental research. In particular, the results of scientific research on the motivational component in the educational process of young female basketball players were further developed due to the peculiarities of communication with this specific group and the formation of motivation for sports improvement (Koryagin et al., 2019; Sushko et al., 2019) the influence of psychological factors on the results of test exercises on physical fitness of young female basketball players has been revealed.

Data on finding the most rational correlations of general and special means in the process of physical training programs for young female basketball players at the stages of preliminary or specialized basic training were further developed (Doroshenko et al., 2020; Gokmen Ozen et al., 2020). This indicates the need to modify modern approaches to the training programs aimed at the effective realization of the individual potential of young female basketball players based on the morpho-functional specialization of their body.

Perspectives for further research are based on in-depth study and testing of modern methodological approaches to improving special physical fitness in various structural elements of the macrocycle of training young female basketball players aimed at developing speed and strength through the use of special physical training exercises.

Conclusions

Analysis of the results, precisely indicators of physical fitness of young female basketball players, allows us to

state that the use of the author's program of physical training made it possible to record the improvement of physical fitness on tests that have speed-strength and strength orientation, namely: jumping height, long jump, run for 40 s, flexion-extension of the arms at thrust lying for 30 s. According to the indicators of speed tests (20 m run and 60 m sprint) no statistically significant differences were recorded, with a tendency to their improvement.

The hypothesis of the effectiveness of targeted use of special exercises in the limited period of the preparatory process (in the training camps), which contributes to the positive dynamics of improving physical fitness and individual potential of young female basketball players is confirmed based on the results of the study.

Acknowledgement

The author's group expresses its gratitude to the coaching staff of the Kyiv sports children's and youth school of the Olympic reserve in basketball, precisely M.S. Dubas and Yu.O. Lapshinova, for assistance in organizing experimental research and implementing the author's program to improve physical fitness in the training process of young female basketball players.

Experimental research was conducted in accordance with the scientific plan of the Department of Physical Education and Pedagogy of Sport at Borys Grinchenko Kyiv University (Ukraine).

Conflict of interest

Authors have declared that no competing interest exists.

References

- Pluta, B., & Andrzejewski, M. (2018). Analysis of team sports results based on the European basketball men's championships. *Trends in Sport Sciences*, 1(25), 21-27. <https://doi.org/10.23829/TSS.2018.25.1-3>
- Teck, K.K., Wang, C.K.J., & Mallett, C.J. (2012). Discriminating Factors between Successful and Unsuccessful Elite Youth Olympic Female Basketball Teams. *International Journal of Performance Analysis in Sport*, 12(1), 119-131. <https://doi.org/10.1080/24748668.2012.11868588>
- Villa, G., & Lozano, S. (2018). Dynamic Network DEA approach to basketball games efficiency. *Journal of the Operational Research Society*, 69(11), 1738-1750. <https://doi.org/10.1080/01605682.2017.1409158>
- Koryahin, V., Blavt, O., & Ponomaryov, S. (2019). Innovative Intestification of Testing of Strength Endurance in Physical Education of Students With Chronic Diseases. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 19(3), 116-122. <https://doi.org/10.17309/tmfv.2019.3.02>
- Sushko, R., Vysochina, N., Vorobiova, A., Doroshenko, E., Pastuhova, V., & Vysochin, F. (2019). Psychological selection in game sports on the basketball example. *Journal of Physical Education and Sport*, 19(3), Art. 250, 1708-1714. <https://doi.org/10.7752/jpes.2019.03250>
- Tyshchenko, V., Hnatchuk, Y., Pasichnyk, V., Bubela, O., & Semeryak, Z. (2018). Factor analysis of indicators of

- physical and functional preparation for basketball players. *Journal of Physical Education and Sport*, 18(4), 1839-1844. <https://doi.org/10.7752/jpes.2018.s4269>
- Doroshenko, E., Sushko, R., Koryahin, V., Pityn, M., Tkalic, I., & Blavt, O. (2019). The competitive activity structure of highly skilled basketball players on the basis of factor analysis methods. *Human Movement*, 20(4), 33-40. <https://doi.org/10.5114/hm.2019.85091>
- Koryahin, V., Dutchak, M., Iedynak, G., Blavt, O., Galamandjuk, L., & Cherepovska, E. (2018). The technical and physical preparation of basketball players. *Human Movement*, 19(4), 29-34. <https://doi.org/10.5114/hm.2018.77321>
- Oliinyk, I., Doroshenko, E., Melnyk, M., Sushko, R., Tyshchenko, V., & Shamardin, V. (2021). Modern Approaches to Analysis of Technical and Tactical Actions of Skilled Volleyball Players. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 21(3), 235-243. <https://doi.org/10.17309/tmfv.2021.3.07>
- Bohuslavskaya, V., Hlukhov, I., Drobot, K., & Pityn, M. (2020). Improvement of theoretical competence of beginner athletes in cyclic sports. *Sport Science and Human Health*, 1(3), 4-11. <https://doi.org/10.28925/2664-2069.2020.1.1>
- Chucha, Yu., Pomeschikova, I., Pashchenko, N., Chucha, N., & Shiryayeva, I. (2020). *Prediction and selection in basketball: [guidelines]*. Kharkiv: KhDAFK, 55 p.
- Mustafa Assaad Munsheed Al-Fartusi, & Sushko R. (2015). Functional reserves for improving the technical and tactical skill of basketball players. *Scientific hour "Scientific and pedagogical problems of physical culture (physical culture and sports)"*, 8(63), 4-7.
- Scanlan, A.T., Fox, J.L., Borges, N.R., Tucker, P.S., & Dalbo, V.J. (2018). Temporal changes in physiological and performance responses across game specific simulated basketball activity. *Journal of Sport and Health Science*, 7(2), 176-182. <https://doi.org/10.1016/j.jshs.2016.05.002>
- Ferraz, R., Marques, M. C., Branquinho, L., & Marinho, D. A. (2021). Effects of applying a training program on basketball shooting in young players. *Journal of Human Sport and Exercise - 2021 - Autumn Conferences of Sports Science*. <https://doi.org/10.14198/jhse.2021.16.Proc2.16>
- Cieślicka, M., Sobko, I., Ulaeva, L., Ishenko, O., Shepelenko, T., Tamozhanska, G., & Bugayets, N. (2019). Improving the protective technique of 13-14-year-old basketball players using rubber bands and unstable platforms. *Journal of Physical Education and Sport*, 19(3), 903-911. <https://doi.org/10.7752/jpes.2019.s3130>
- Platonov, V., & Bolshakova, I. (2013). *Forcing long-term training of athletes and the Youth Olympic Games*. Science in Olympic sports. 2, 37-42.
- Poplavsky, L.U., Maslova, O.V., Bezmirov, M.M., Mitova, O.O., Murzin, E.V., & Chetvertak, O.A. (2019). *Curriculum for CYSS, SDYUSHOR, SHVSM and specialized educational institutions of sports profile*. Ministry of Youth and Sports of Ukraine, Republican Scientific and Methodological Office, FBU. 166 p. <http://dsmsu.gov.ua/media/2019/03/04/39/Basketbol.pdf>
- Helsinki Declaration of the World Medical Association "Ethical principles of medical research with human participation as an object of study" (2008).
- Vincent, W.J. (2005). *Statistics in kinesiology*. 3rd ed. Champaign: Human Kinetics, 312 p. <https://www.amazon.com/Statistics-Kinesiology-William-Vincent/dp/1450402542>
- Lang, T., & Altman, D. (2013). *Basic statistical reporting for articles published in clinical medical journals: the SAMPL Guidelines*. In: Smart P., Maisonneuve H., Polderman A. (eds). Science Editors' Handbook, European Association of Science Editors. <https://www.equator-network.org/wp-content/uploads/2013/07/SAMPL-Guidelines-6-27-13.pdf>
- Alexandropoulos, S.-A. N., Kotsiantis, S. B., & Vrahatis, M. N. (2019). Data preprocessing in predictive data mining. *The Knowledge Engineering Review*, 34, e1. <https://doi.org/10.1017/S026988891800036X>
- Gokmen Ozen, Ozdemir Atar, & Hurmuz Koc. (2020). The Effects of A 6-Week Plyometric Training Programme on Sand Versus Wooden Parquet Surfaces on the Physical Performance Parameters of Well-Trained Young Basketball Players. *Monten. J. Sports Sci. Med.*, 9(1), 27-32. <https://doi.org/10.26773/mjssm.200304>
- Tuan Tran Minh, Cuong Tran Ngoc (2022). Effects of a 15-week basketball training program following the club model in physical education courses for female students at Saigon University. *Journal of Physical Education and Sport*, 22(1), Art 26, 202-209.
- Doroshenko, E., Sushko, R., Shamardin, V., Prykhodko, V., Shapovalova, I., Yeliseieva, D., Demidova, O., & Yakovenko, A. (2020). Analysis of the Competitive Activity Structure of Skilled Female Basketball Players. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 20(4), 219-227. <https://doi.org/10.17309/tmfv.2020.4.04>
- Koryahin, V., Blavt, O., Doroshenko, E., Prystynskyi, V., & Stadnyk, V. (2020). Training Effect of Special Basketball Exercises. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 20(3), 137-141. <https://doi.org/10.17309/tmfv.2020.3.02>
- Platonov, V.N. (2017). *Motor qualities and physical training of athletes*. K. : Olympic literature, 656 p. https://www.researchgate.net/publication/323880488_Dvigatelnye_kacstva_i_fiziceskaa_podgotovka_sportsmenov
- Onishchenko, V., & Mitova, O. (2015). Problems of modern training of children in the conditions of early specialization in sports games and their connection with the construction of the educational and training process (on the example of mini-basketball). *Young sports science of Ukraine*, 1, 166-172. http://repository.ldufk.edu.ua/bitstream/34606048/2946/1/Онищенко_28.pdf
- Kozina, Z., Iermakov, S., Cretu, M., Kadutskaya, L., & Sobyaniy, F. (2017). Physiological and subjective indicators of reaction to physical load of female basketball players with different game roles. *Journal of Physical Education and Sport*, 17(1), 56, 378-382. <https://doi.org/10.7752/jpes.2017.01056>

СУЧАСНІ ПІДХОДИ ДО ФІЗИЧНОЇ ПІДГОТОВКИ ЮНИХ БАСКЕТБОЛІСТОК

Оксана Комоцька^{1ABCDE}, Руслана Сушко^{1ABCDE}

¹Київський університет імені Бориса Грінченка

Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 8 с., 2 табл., 2 рис., 28 джерел.

Мета дослідження – обґрунтувати, розробити і перевірити ефективність програми фізичної підготовки юних баскетболісток у передзмагальному періоді підготовчого етапу макроциклу і експериментально перевірити її ефективність.

Матеріали та методи. Контингент – 15 юних баскетболісток 2007-2008 р.н., третього року навчання (1й рік навчання у групі базової підготовки), учасниць Всеукраїнської юнацької баскетбольної ліги (ВЮБЛ), які взяли участь у експериментальній програмі з метою підвищення рівня фізичної підготовленості. Тричі проведено тестування за 6 показниками фізичної підготовленості. Проаналізовано та інтерпретовано результати послідовного експерименту під час навчально-тренувального збору юних баскетболісток.

Результати. Розроблено і під час навчально-тренувального збору впроваджено авторську програму фізичної підготовки юних баскетболісток з метою підвищення їх рівня фізичної підготовленості і підготовки до участі у змаганнях ВЮБЛ. Результати дослідження, отримані в ході проведення послідовного експерименту, дозволили вивчити і проаналізувати 6 показників фізичної підготовленості,

обґрунтувати ефективність сучасних підходів до фізичної підготовки юних баскетболісток у передзмагальному періоді підготовчого етапу макроциклу, засновані на мінімізації додаткового навантаження і акцентованій концентрації уваги спортсменок на якості виконання специфічних вправ у лімітований період.

Висновки. Аналіз отриманих результатів - показників фізичної підготовленості юних баскетболісток дозволяє констатувати, що використання авторської програми фізичної підготовки дозволило зафіксувати покращення показників фізичної підготовленості за тестами, які мають швидкісно-силову та силову спрямованість, а саме: висота підскоку, стрибок у довжину з місця, біг протягом 40 с, згинання-розгинання рук в упорі лежачи за 30 с. За показниками тестів швидкісної спрямованості (біг 20 м і спринт 60 м) статистично значущих відмінностей не зафіксовано, при наявній тенденції до їх покращення.

Ключові слова: баскетбол, програма, фізична підготовка, фізична підготовленість, навчально-тренувальні збори.

Information about the authors:

Komotska Oksana: o.komotska@kubg.edu.ua; <https://orcid.org/0000-0003-3109-1120>; The Faculty of Health, Physical Training and Sports, Borys Grinchenko Kyiv University, Marshala Tymoshenko St, 13-B, Kyiv, Ukraine.

Sushko Ruslana: r.sushko@kubg.edu.ua; <https://orcid.org/0000-0003-3256-4444>; The Faculty of Health, Physical Training and Sports, Borys Grinchenko Kyiv University, Marshala Tymoshenko St, 13-B, Kyiv, Ukraine.

Cite this article as: Komotska, O., & Sushko, R. (2022). Modern Approaches for the Physical Training of Young Female Basketball Players. *Teoriâ ta Metodika Fizičnogo Vihovannâ*, 22(2), 260-267. <https://doi.org/10.17309/tmfv.2022.2.17>

Received: 25.04.2022. Accepted: 19.05.2022. Published: 25.06.2022

This work is licensed under a Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0>).