

Improvement of technical skills of 14-16 years old athletes who are engaged in aesthetic group gymnastics

NINA DOLBYSHEVA¹, VIKTORIYA KIDON², NINA KOVALENKO³, IRYNA HOLOVIICHUK⁴,
ALEXANDER KOSHCHEYEV⁵, VALERIA CHUHLOVINA⁶

^{1,5,6} Faculty of Physical Culture and Sport, Department of Theory and Methodology of Sport Training, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE.

³ Faculty of Physical Education, Department of Foreign Languages, Prydniprovsk State Academy of Physical Culture and Sport, Dnipro, UKRAINE.

^{2,4} Faculty of Finance, Department of physical training and special training, University of Customs and Finance, Dnipro, UKRAINE.

Published online: March 31, 2020

(Accepted for publication: January 27, 2020)

DOI:10.7752/jpes.2020.02082

Abstract

The purpose was to introduce in the training process the author's technique for improving technical skills at the stage of specialized basic training of the third year of training and to determine its effectiveness for the technical readiness indicators and the result of competitions. *The object* of the study was the technical preparedness of gymnasts. *Participants* - 2 teams of athletes of Ukraine with aesthetic group gymnastics (Viva Victoria team of Dnipropetrovsk region and Vivend team of Zaporizhzhya region). Each team consisted of 12 gymnasts aged 14-16 years, which meets the requirements of international rules on aesthetic group gymnastics. *Results*. Introduced author's technique for improving technical skills in the training process contributed to the improvement of technical training of gymnasts in the data of such tests as "series including any three different body movements" and "supplementary difficulty" at $p \leq 0.001$, and an increase of 11.74%. Quantitative and qualitative correlation relationships between technical readiness indicators increased (up to 10 interconnections out of 10 possible) at a reliability of $p \leq 0.05-0.01$. The result of the team's competitive activity, both at the national and at the world levels, increased by an average of 0.45 points (9.47%) and execution - by 0.40 points (5.13%). *Conclusions*. Planning in the training process of the author's technique for improving the technical skill of female athletes engaged in aesthetic group gymnastics, contributed to the improvement of technical readiness and the result of competitive activity, which gives the basis for its practical implementation in the system of training of female gymnasts at the stage of specialized basic training.

Keywords: aesthetic group gymnastics, improvement, methods, technical training, preparedness.

Introduction

Since the 1990s, aesthetic group gymnastics has reached the international level, which has contributed to its intensive development on all continents of the world, and in Ukraine as well. Today the competition compositions are original, complete, logical and have an individual style.

The current high level of sports results and increased competition in aesthetic group gymnastics requires a sufficiently high level of technical readiness of athletes (Borysova Yu. 2012), choreographic readiness (Fahrieva I.A., 2016; Sosina V., Ruda I., Akimova S., 2013; Sosina V.Yu., 2018), acrobatic readiness (Karpenko L.A., Zhigareva S.A., 2016), which depend on the functionality of the body, vestibular stability, level of physical qualities, first of all flexibility and coordination abilities (Borysova Yu. 2012; Kashuba V., Gordeeva, M., Zhuk A., Rizatdinova A., Litvinenko Yu., 2017; Matveev L. P., 1999; Ogurtsova U. M., 2016; Sadowski J., 2015).

In the scientific works L.P. Matveiev (1999), V.M. Platonov (2011, 2015), Yu. K. Gaverdovsky (2014), I.A. Wiener-Usmanova (2015), Sadowski J. (2015) focus on the fact that the most fundamental, complex and purposeful technical training is provided at the stage of specialized basic training, which is highly specialized in individual technical improvement, accumulation of competitive experience, planning significant volumes of training loads.

In gymnastic sports, some scientists identify the general technical training and basic technical training (Gaverdovskiy Yu.K., 2014; Todorova V., 2018; Vishnyakova S.V., Lalaeva E.Yu., Andreenko T.A., 2017) as the same, and identify the special one with the formation of knowledge about the technique of sports actions, the development of individual forms of technique of competitive movements, the formation of skills necessary

for successful performance at competitions, conversion and updating of movements forms, formation of new forms of sports technique, namely with larger complication or execution of them in different variants and conditions (Gaverdovskiy Yu. K., 2007; Vishnyakova S. V., 2012).

Scientific research has shown that the works of scientists present scientific and practical approaches to improving the individual components of the technical skills of female athletes in aesthetic gymnastics: art of expressiveness (Karavatskaya N.A., 2002), artistry (Plehanova M.E., 2006; Rummyantseva A.S., 2016; Viner-Uzmanova I. A., Medvedeva E. N., Kryuchek E. S., 2015), arsenal of movements (Lisitskoy T.S., 1982), acrobatic fitness (Karpenko L.A., Zhigareva S.A., 2016), choreographic readiness (Kuzmenko M. V., Fahrieva I. A., Boldyireva V. B., 2017; Leonova L.V., 2003; Sosina V.Yu., 2018; Todorova V., 2018), structure and composition of composition (Karpenko L.A., Saveleva L.A., Rumba O.G., 2009; Lisitskaya T.S., Novikova L.A., Lubyisheva S.V., 2009; Vishnyakova S. V., Lalaeva E. Yu., Andreenko T. A., 2017), jump preparedness (Lazarenko T. P., 1991)]. Therefore, the questions concerning the development of the author's technique for improving the technical skill of female athletes in aesthetic group gymnastics, taking into account the complex approach, are relevant today.

Material and methods

Participants

The sample included 2 teams of Ukraine's athletes of aesthetic group gymnastics ("Viva Victoria" team of Dnipropetrovsk region and "Vivend" team of Zaporizhzhia region). Each team consisted of 12 gymnasts aged 14-16 years which meets the requirements of international rules on aesthetic group gymnastics. According to the training program on aesthetic group gymnastics for the stage of specialized basic training, approved by the Federation of Aesthetic Gymnastics of Ukraine (2008), the training process of gymnasts aged 14-16 years was carried out within the stage of specialized basic training.

Goals, methods and procedures

The aim of the study is an experimental verification of the introduction of the author's method of improvement the technical skills of gymnasts of the third year of training at the stage of specialized basic training in the training process.

The object of the study is the technical preparedness of female athletes engaged in aesthetic group gymnastics.

Certain goals of the research, prior to the assignment, were created and had tasks to be followed:

1. To analyze the scientific-methodical literature on the research problem.
2. To determine the place and importance of technical training in the training process of gymnasts' training.
3. To evaluate the level of technical preparedness of 14-16 years old female gymnasts.
4. To develop and introduce in the training process during the annual cycle of preparation the author's method for improving the technical preparedness of 14-16 years old female gymnasts.
5. Determine the effectiveness of the implemented author's method on the technical preparedness and competitive result.

To solve these problems, the following research methods were used:

1. Analysis and generalization of scientific and methodical literature in the study.
2. Natural experiment.
3. Questioning.
4. Control testing to assess the level of technical readiness of gymnasts.
5. Methods of Mathematical Statistics.

Control testing to assess the level of technical preparedness of female gymnasts was carried out on the control tests prescribed in the training program on aesthetic group gymnastics for the stage of specialized basic training, approved by the Federation of aesthetic gymnastics of Ukraine (2008): «series including any two different body movements», «series including any three different body movements», «jump / leap series», «balance series», «supplementary difficulty». The level of technical preparedness for the above-mentioned control tests was determined by a five point expert evaluation system. The experts were coaches in aesthetic group gymnastics who had the first and the highest coaching categories (according to the categorical nature in Ukraine). The five-point system was assessed according to the amount of diminutions for the technique of performing the elements (tests), the descensions were evaluated according to the Competition Rules of Aesthetic Group Gymnastics for Children (2016). So, if a gymnast performed an element (test) with minor errors that did not require reducing the cost of the test to 0.3 points, for the technique of performing the theta experts score 5 points. When performing the test with errors, the cost of diminutions, which were 0.4-0.5 points, was awarded 4 points, the performance of the test with errors, the cost of diminutions, which made 0.6 and more points, was rated at 3 points, in the case of failure of the test gymnast receives 2 points.

Instrument

The investigated material was processed using the methods of mathematical statistics on a personal computer using the software "Statistica 6.0" and the software application MS Excel (2010).

The main indicators of mathematical statistics were: \bar{x} – mean, SD – standard deviation, CV – coefficient of variation, r - correlation analysis. To confirm the hypothesis as to the effective influence of the author's technique on the level of technical preparedness of female gymnasts used t_{score} – Student's t-test, the level of significance was taken as $p < 0,05-0,001$.

Ethical approval

The research related to human use has been complied with all relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki and the National Health Advisory Board, and has been approved by the authors' institutional ethics committee.

Informed consent Informed consent was obtained from all individuals included in this study.

Results

An analysis of the scientific and methodological literature on the problem of research showed that the approaches available today to improve the technical skills do not fully ensure the high efficiency of the training process. Therefore, there is a need to find new ways to improve the technique of technical skill of female athletes engaged in aesthetic group gymnastics at different stages of training, in particular at the stage of specialized basic training.

The development of the author's technique for improving technical skills based on:

1. Curriculum for junior aesthetic gymnastics schools (2008), which states that more than 70-80% of the total training time is planned for technical training.

2. The results of a survey of 35 coaches of the first and the highest category (71.4% of those who had special sports education), who indicated that during training the emphasis was placed on improving the technical skills of performing gymnastic exercises at the stage of specialized basic training (Kydon V., 2013). It is due to the fact that the result for the gymnastic composition is evaluated primarily for execution (EXE), technical value (TV) and artistic value (AV). The trainers mentioned that while performing the elements the most errors occur when athletes perform balance and jump, as indicated by 82.2% and 74.2% of the respondents (respectively), the least mistakes are made by gymnasts when they perform swing and jump - 12.4 % and 5.7% (respectively). Therefore, it is quite logical that trainers allocate 31.3% -53.7% of the total time for the improvement of the technique of balance and jump execution, for the improvement of the technique of the wave execution - 15.2% - 24.5%, for the improvement of the technique of execution of swing and jump/leap series - 5.6% -10.5%, and other movements - 2.5% -8.6%.

3. Quantitative and qualitative performance indicators of required elements, supplementary difficulty and other movements in the competition program, which were determined on the basis of a video analysis of 10 world championship teams. Their results show that:

- in aesthetic group gymnastics, which is a team sport, the number of individual elements was 56.5%, 19.3% - formation, 16.1% - total body movements technique and 8.1% - acrobatic movements in the form of various lift;

- the most specific are the exercises that form the basis of the competition program (compositions), these are obligatory body movements (52.6%), as well as gymnastic exercises of a certain complexity - balance (21.1%), jump (26.3%), skips and hops (33.3%), acrobatic movements and lifts (33.3%), body movements (1.3%), arm movements (13.3%) and leg movements (6.8%);

- a significant number of mistakes were observed during balance (46.9%), jump (37.5%), body movements (37.5%) and total body movements technique (25.0%) (Dolbysheva N.H., Kydon V.V., 2018).

4. The technical preparedness of female gymnasts 14-15 years old, which ranged from 3.28 to 4.07 points, showed their average level (Kydon V., 2015). The coefficient of variation indicated an internal discrepancy ($V = 18.55-26.65\%$), and Student's t-test showed a significant difference ($p \leq 0.05-0.001$) among almost all indicators of these tests (Table 1).

Table 1. Indices of technical readiness of gymnasts 14-15 years at the beginning of the third year of training (at the group level) (n = 24)

Tests to assess technical readiness	Statistical characteristics			
	\bar{x}	$\pm SD$	CV	significant difference (p)
Series including any two different body movements, scores	4.07	0.75	18.55	
series including any three different body movements, scores	3.28	0.87	26.61	at $p < 0.05$ between p_{1-2} at $p < 0.001$ between p_{1-3} :
balance series, scores	3.71	0.88	23.62	$p_{1-4}; p_{1-5}; p_{2-4}; p_{2-5}$
jump/leap series, scores	3.58	0.95	26.65	at $p > 0,05$ between $p_{2-3}; p_{3-4}; p_{4-5}$
supplementary difficulty, scores	3.39	0.80	23.51	

\bar{x} – mean, SD – standard deviation, CV – coefficient of variation

The author's technique for improving the technical skills of gymnasts was introduced into the annual cycle at the stage of specialized basic training, which had a dual macrocycle consistent with the purpose and objectives of the stage, the basic laws of the principles of sports training (didactic, methodical and specific) and the calendar of competitions:

I macrostructure cycle: preparatory period (September-October) - 2 basic mesocycles; Competition period (November-December) - control and training mesocycles.

II cycle of macrostructure: preparatory period (January-March) - 2 basic, control and preparatory mesocycles; competition period (April-May) - pre-competitive and competitive mesocycles; transition period (June-August) - a reductive, retractable mesocycle.

During the annual cycle, there were planned 194 training sessions in the preparatory and competitive periods, 4-5 one-time trainings a week for 2-3 hours, the volume of technical training was 55-75%, physical - 15-35%, integrated - 5-10% for a year. Gymnasts were expected to participate in 4 competitions of different levels.

The author's method involved the use of methods and means of practical and applied nature. The main methods of practical nature were: performance of the exercise as a whole and in parts, trial attempts, repeated and variational exercises, game method; of applied character - trial attempts, audio and video methods, variation of effort, speed and conditions of exercise, modeling of competitive conditions, competitive method and its modifications. The use of practical and applied methods had their consistency in accordance with the tasks of the training process. The complex of practical tools included auxiliary, corrective, profiling, semi-acrobatic, imitation, underwater exercises, and applied character - competitive exercises, training forms of competitive exercises, acrobatic exercises and supports, stylized and scene-role exercises, choreographic ones. The planning of the funds was carried out taking into account the technical preparedness of gymnasts on the basis of planning and gradualness (Dolbysheva N., Kydon V., 2017).

To improve the definite required elements and acrobatic movements, the author's method involved the introduction of 5 blocks of exercises to improve the technique of performing balance (B_{1-5}), pivots (P_{1-3}), body movements (BM_{1-4}), jump (J_{1-4}), acrobatic movements and lift (A_{1-4}). Each block consisted of 3-5 complexes, which consisted of 5-8 exercises that were planned in training according to the period and mesocycle of training, structure, tasks, duration and orientation of the training session (Table 2).

The results of factor analysis made it possible to distribute the ratio of planning of exercise blocks. In the first preparatory period, the volume of blocks for improving balance, pivots and jump was 50-60%; in the first competitive period - 40-50%, in the second preparatory - 40-50%, in the second competitive - 30-40%. The volume of implementation of blocks of exercises for improvement of body movements, acrobatic movements and lift, in the first and second preparatory period was up to 15%, in the competitive - up to 10%. Considerable attention was paid to the development of flexibility and vestibular stability.

The intensity of physical load while performing the required elements and acrobatic movements, according to the stage of skill formation, corresponded to the heart rate, which ranged from 90 beats per minute¹ to 160 beats per minute⁻¹.

The basis of the author's methodology was the planning of centralized training sessions in the control-preparatory and pre-competition mesocycle with an emphasis on the choreographic component of 10-30% (20-40 minutes) and the artistic component (acting) of 5-20% (10-30 minutes) of the total training time. Leading experts in choreography and theatrical arts were involved in such classes (Figure 1).

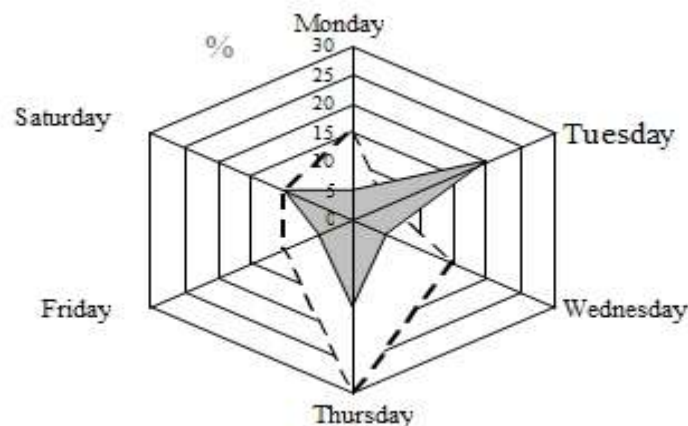


Figure 1. Ratio of planning of choreographic and artistic components within a week during the planning of the centralized trainings (%): - choreographic component; - an artistic component

Table 2. Ratio of training means in training sessions (example)

Preparatory period of the first annual macrocycle									
I The second basic mesocycle									
Training session № 24									
II	Preparatory part			Main part				Final part	
III	10'	10'	10'	20'	15'	15'	35'	10'	10'
IV	Overall warm-up	Special warm-up	Block of exercises for improvement of flexibility	Blocks of exercises for improvement of balance (B ₁₋₂)	Block of exercises for improvement of pivots (P ₃)	Block of exercises for improvement of jump (J ₁)	Working out of a part of a composition individually and a group for musical accompaniment	Block of exercises for development of jumping ability	Jogging, passive exercises for flexibility
V	Planning of general-developing and special-preparatory exercises	Planning of special-preparatory and submarine exercises	Use of active and passive exercises	Development of coordination skills, jumping ability and vestibular stability			Emphasis on improving balance (on one and two legs), pivots (in equilibrium) and jump (varieties in twine)	Development of jumping ability and vestibular stability	
Competitive period of the first annual macrocycle									
I Control and preparatory mesocycle									
Training session № 69									
II	Preparatory part			Main part				Final part	
III	10'	10'	15'	45'		15'	15'	15'	10'
IV	Overall warm-up	Special warm-up	Exercise block Flexibility development	Exercising a part of composition as a whole for musical accompaniment		Exercise blocks for improvement of balance (B ₃)	Exercise block for improvement of jump (J ₄)	Exercise block for improvement of acrobatic movements and lift (A ₄)	Passive exercises for flexibility
V	Planning of general-developmental and special-preparatory exercises	Planning of special-preparatory and supplying exercises	Use of passive and active exercises	Emphasis on technical mastery of performance required elements and supplementary difficultly competition program			Development of vestibular stability	Development of jumping ability and vestibular stability	Development of vestibular stability

I is a characteristic of the training structure; II - structure of training session; III - duration in minutes; IV - sports training planning features; V - planning of sports training means or their orientation: B₁₋₅ - block of exercises for the improvement of technique of execution of balance; P₁₋₃ - block of exercises for the improvement of technique of execution of pivots; J₁₋₄ is a block of exercises to improve the technique of execution of jump; A₁₋₄ is an acrobatic movements and lift exercise block

The choreographic component included classical and contemporary (neoclassical) choreography. Classical choreography has improved the style and dynamics of movements, the amplitude of movements, the sense of rhythm and tempo and more. Contemporary (neoclassical) choreography was used to develop the expressiveness, musicality, artistry of each gymnast and team as a whole in accordance with the style of the competitive composition. This component of technical training made it possible to improve the choreographic staging of the competition composition in accordance with the musical accompaniment (Dolbysheva N., Kidon V., 2017).

The artistic component was aimed at developing the skills of acting and the ability to present a competitive composition as a theatrical performance, which allowed to increase the emotional composition through movements, facial expressions and expression of the eyes. It was such classes where gymnasts formed the art of impersonation. In order to improve the technical, psychological, integral fitness and adaptation of gymnasts to competitive loads, it was proposed to use 6 training competitions in the basic mesocycles of the first and second preparatory periods and 2 model competitions in the second basic mesocycle of the first preparatory period and control and training cycle. To improve the quality of the evaluation system of the competitive composition and technical skill of gymnasts, a working technical protocol (using symbols) was introduced, which allowed to create a single transcript recording, for the judges to concentrate attention on the technique of performing exercises, to reduce time for calculating points for technical value and to reduce differences credits for a competitive track. In order to determine the effectiveness of the author's methodology, a second test was conducted at the end of the third year of training at the stage of specialized basic training in terms of technical readiness and analysis of the results of competitions. Analysis of the results at the end of the annual training cycle indicates significant differences in technical readiness in the two control tests (series including any three different and supplementary difficultly) in the core group at $p \leq 0.001$ (Table 3.). Other indicators of technical readiness tend to improve in the core group from 6.62% to 16.99%, in the control one - from 2.27% to 10.23%.

Table 3. Indicators of technical readiness of gymnasts of the control and main groups before and after the introduction of the author's methodology (at the intra-group level)

Control tests	Statistic Data	Control group (n = 12)		P, t _{score}	Core group (n=12)		P, t _{score}
		before	after		Before	after	
Series including any two different body movements, score	$\bar{x} \pm SD$	4.06±0.8	4.17±0.6	≥0.05; 0.372	4.00±0.6	4.34±0.4	≥0.05; 1.010
	CV	20.38	15.43		16.28	11.36	
	p, t _{score} (before/after)	≥0.05; 0.087 / ≥0.05; 0.716					
series including any three different body movements, score	$\bar{x} \pm SD$	3.25±0.8	3.58±0.4	≥0.05; 1.126	3.56±0.7	4.17±0.4	≤0.01; 2.492
	CV	24.79	11.99		20.90	9.94	
	p, t _{score} (before/after)	≥ 0.05; 0.651 / ≤0.001; 3.395					
balance series, score	$\bar{x} \pm SD$	3.61±1.1	3.94±0.6	≥0.05; 0.933	3.81±0.6	4.17±0.6	≥0.05; 1.408
	CV	29.69	15.64		17.32	14.28	
	p, t _{score} (before/after)	≥0.05; 0.534 / ≥0.05; 0.896					
jump/leap series, score	$\bar{x} \pm SD$	3.39±0.95	3.83±0.3	≥0.05; 1.497	3.78±0.9	4.03±0.5	≥0.05; 0.769
	CV	28.11	10.20		25.35	14.74	
	p, t _{score} (before/after)	≥0.05; 0.998 / ≥0.05; 0.946					
supplementary difficulty, score	$\bar{x} \pm SD$	3.33±0.92	3.47±0.3	≥0.05; 0.484	3.44±0.6	4.03±0.3	≤0.01; 2.612
	CV	27.64	10.43		19.94	8.96	
	p, t _{score} (before/after)	≥0.05; 0.332 / ≤ 0.001; 3.772					

\bar{x} – mean, SD – standard deviation, CV – coefficient of variation, p – significant difference, t_{score} – Student's t-test

The confirmation of the effectiveness of the author's technique is the increase of correlation relations: in the core group from 5 cases with correlation coefficients $r = 0,366-0,631$ up to 10 (out of 10 possible) with correlation coefficients $r = 0,274-0,930$ (Figure 2), and in the control group both at the beginning and at the end of the training year, were determined in 5 cases with coefficients of variation $r = 0,260-0,613$ to $r = 0,201-0,537$ accordingly (Figure 3).

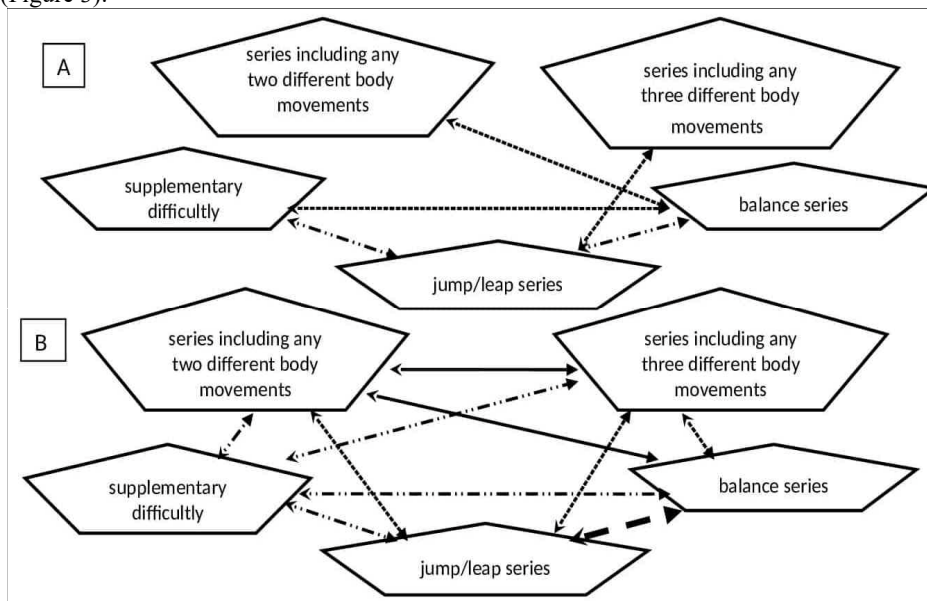


Figure 2. Intra-group correlation of the technical readiness of gymnasts from the core group of the third training year on the stage of specialized basic training:

A - at the beginning of the training year, B - at the end of the training year
 ↔ - very weak; ↔ - weak; ↔ - mild; ↔ - strong

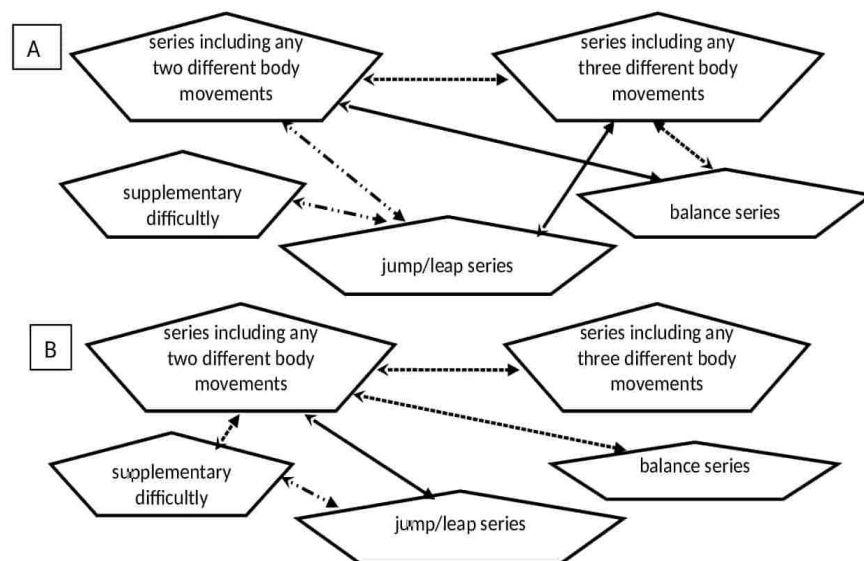


Figure 3. Intra-group correlation of the technical readiness of gymnasts from the control group of the third training year on the stage of specialized basic training:

A - at the beginning of the training year, B - at the end of the training year
 ↔ - very weak; ↔ - weak; ↔ - mild; ↔ - strong

A comparative analysis of the competition results showed that the core group of the "Viva Victoria" team (which moved to the age group 16 and over), both nationally and globally, improved their competitive performance by an average of 0.45 points (9.47%), performance techniques by 0.40 points (5.13%), which allowed them at the Ukrainian Championship to reach the first spot of the pedestal of honor, and at the world level competitions enter the six strongest teams.

Discussion

In the system of sports training there are different approaches to improving the technical skills of female gymnasts. According to the authors, it can be implemented through a separate component of technical training. This technique has a comprehensive approach to improve the technical skills of gymnasts aged 14-16 years which was planned in the annual cycle of the specialized basic training phase of the third year of study. The data provided here indicates its effectiveness.

The author's technique has useful information for both athletes and practicing coaches in aesthetic group gymnastics. Some component techniques can be used at different stages of sports training. It is noteworthy that the practical and applied methods and tools pointed out by Yu. K. Haverdovsky (2014) and used in the training in rhythmic gymnastics, women's artistic gymnastics and acrobatic gymnastics. The main difficulty lies in choosing some of them, in the process of which it is necessary to take into account the individual level of technical readiness of female gymnasts and especially competition program.

To improve the required elements, supplementary difficulty and acrobatic movements, it is necessary to form gymnastic exercises into blocks, which should cover exercises similar in biokinematic and biodynamic structure, which will facilitate their interaction in the process of improvement according to the "transfer of motor skills". It is also necessary consider cause and effect relationships that are related to the origin of the errors, the causes of the errors, the manifestation of physical quality and functionality. The results of correlation relationships of control tests on technical readiness, at the end of the year of training, confirm the effectiveness of the use of exercise blocks according to the biokinematic and biodynamic structure, as their quantitative and qualitative correlation relationship has increased, which confirms theoretical provisions and practical studies on "interconnections and transferring motor skills".

It may be contradictory to plan exercise blocks throughout the year in different training periods (preparatory and competitive), it can be explained by the fact that the improvement of the technical skills of gymnasts is carried out at the individual level and the use of exercise blocks for the group of gymnasts must be individual. In our case, the planning was done for all gymnasts at the same time, but the load was planned individually for each gymnast, depending on the technical skill of performing one or another exercise.

Important from the point of view of scientific discussion is the problem of organizing centralized training sessions and planning of choreographic and artistic components that allow to improve not only technical but also artistic skill. Therefore, in our opinion, these components of technical skill are quite logical and necessary.

Regardless of the fact that during the annual cycle of gymnastics take part in 4 major competitions nationally and internationally from our point of view, it is necessary in the training process in order to adapt to competitions, mental readiness, determine the level of technical skill to plan competitive loads in the form of training or model competitions.

To improve the required elements, supplementary difficulty and acrobatic movements, it is necessary to form gymnastic exercises into blocks, which should cover exercises similar in biokinematic and biodynamic structure, which will facilitate their interaction in the process of improvement according to the "transfer of motor skills". Also consider cause and effect relationships that are related to the origin of the errors, the causes of the errors, the manifestation of physical quality and functionality. The results of correlation relationships of control tests on technical readiness, at the end of the year of training, confirm the effectiveness of the use of exercise blocks according to the biokinematic and biodynamic structure, as their quantitative and qualitative correlation relationship has increased, which confirms theoretical provisions and practical studies on "interconnections and transferring motor skills".

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Regardless of the fact that during the annual cycle gymnastics take part in 4 major competitions national and international levels from our point of view, in order to adapt to competitions, mental readiness, determine the level of technical skill to plan competitive loads in the form of training or model competitions in the training process is necessary.

The results achieved at "Viva Victoria" competitions can be considered as natural from one point of view, since in the course of many years the technical skill of gymnasts is improved, and on the other hand the influence of the author's technique is improved, as the transition of gymnasts to the age category "16 years and older" allowed them to adapt to the new competition program in a short time and reduce the number of mistakes (technical errors).

Conclusions

1. Theoretical analysis of the scientific and methodological literature showed the need to find directions for improving technical skills in gymnastic sports at all stages of training, which is associated with increasing requirements for technical complexity, technique performance of elements and competitiveness at the international level. It is stated that ensuring a sufficiently high level of sportsmanship, as a prerequisite for achieving the highest results, is carried out at the expense of fundamental, comprehensive and focused technical training at the stage of specialized basic training. In this regard, it became necessary to develop an author's technique for improving the technical training of female athletes aged 14-16, engaged in group aesthetic gymnastics at the stage of specialized basic training of the third year of training in accordance with didactic, methodological and specific principles of sports training.

2. The author's technique of improving technical preparedness was introduced into the training and training process of the dual-cycle annual training, the differences of which were: the application of methods and means of practical and applied nature; planning of blocks of exercises for improvement of required elements (for improvement of execution technique of balance, body movements, pivots, jump), acrobatic movements and lift; planning of choreographic and artistic components of technical training (in the amount of 10-30% and 5-10% of the total training time, respectively) in the training process of centralized meetings; planning of 6 training and 2 model competitions, in basic and control training cycles; development and implementation of a working technical protocol with the use of symbols, which allowed to carry out an operative assessment of the level of technical readiness of gymnasts in the process of competitive activity.

3. The analysis of the results after the implementation of the author's methodology shows that:
- the level of technical readiness in the core group of female athletes improved to the rating of "good", in the control one it remained at the level of "satisfactory". Significant increase was observed in female athletes of the core group in the indicators of control tests "series including any three different body movements" and "supplementary difficulty" ($p \leq 0.001$). Other indicators showed a tendency for improvement in the core group of female athletes by an average of 11.74%, in the control group - by 7.90%;

- increased quantitative and qualitative correlation relationships between technical readiness indicators (up to 10 interrelationships out of 10 possible) at a reliability of $p \leq 0.05-0.01$, in gymnasts of the core group;

- the results of the competitive activities of the Viva Victoria team, which made up the main group, both nationally and globally, tended to increase by technical value by an average of 0.45 points (9.47%) and performance techniques - by 0.40 points (5.13%):

Thus, the planning of the author's technique for improving the technical training of female athletes engaged in aesthetic group gymnastics, contributed to the improvement of technical readiness and the result of competitive activity, which gives the basis for its practical implementation in the system of sports training of gymnasts at the stage of specialized basic training in the third year of training.

Acknowledgements

The authors wish to thank all gymnasts of the national teams of Dnipropetrovsk and Zaporizhzhia regions, coaches Zayats Larissa and Hlukh Valentin, President of the Federation of Aesthetic Group Gymnastics of Ukraine Sporishov Vasily for providing assistance and expressed interest in scientific research and professor Togobytska Daria. for assistance in processing statistics.

Disclosure statement

No author has any financial interest or received any financial benefit from this research.

Conflict of interest

The authors state no conflict of interest.

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