



Improving the technique of performing elements of sports dance for dancers aged 15-16 at the stage of specialised basic training

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Abstract. The specificity of modern competitive dances requires a high level of preparedness, the ability to maintain maximum concentration, precise execution of dynamic movements and their biomechanical optimisation. A special role in the construction of the training process is attributed to the technical execution of elements within the European dance programme. Therefore, the purpose of the study was to scientifically substantiate the improvement of the technique of the dance elements of the European programme and to create corresponding training methods for dancers aged 15-16 at the stage of specialised basic training. The research involved 40 athletes aged 15-16 of category C according to the regulations of the International Dance Sport Association. The level of specialised training was determined through expert evaluation of the components of five types of competitive activities. Training session models were developed with the aim of improving motor skills and improve technical mastery the performance of dance elements of the European dance programme. According to the developed model, each session involved the combined use of physical and technical training methods by selecting comprehensive "blocks" of exercises that addressed additional physical conditioning tasks, and "blocks" of selected foundational exercises and individual figures from the European dance programme aimed at

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refining the technical preparedness. It was found that it is advisable to apply various foundational exercises, elements of dance figures at different tempos with fixation of points in the respective positions, swing movements and steps in balance and semi-balance with movement in different directions, to refine sways and shapes, and to use various jumps and running step variations: a run corresponding to the conditions of competitive dance execution and a run during which an additional dance is performed between each dance, depending on the focus of the session. The research findings can assist experts in sports dancing in improving the training process for dancers

Keywords: models of training classes; the European programme; couples; swing; balance; semi-balance

Introduction

Sport dance is continuously gaining popularity among different groups of the population. It represents a special kind of creative activity that tightly combines sport and art. In 2023, sports dancing is not just an art; it is a highly popular sport that captivates with its beauty and complexity and continues to evolve. Such performances require from dancers a sufficiently high level of different types of preparedness. As experts point out, different types of preparedness in the process of sports training in a competitive activity are not implemented in isolation. The improvement of physical preparedness contributes to increasing the level of technical skill, and together they contribute to high tactical and psychological preparedness. This is expressed in effective competitive activity. Many experts in their studies depict the development of sports dancing, looking for opportunities to enhance dancers' skills.

Y. Husak & V. Vorona (2021) in their research have identified that after the recognition of sports dancing as a type of sport, several directions have emerged regarding their use in the field of physical culture and sports. For educational institutions of various types, scientists have developed programmes and methodologies for the implementation of sports dancing elements in the physical education of preschool and school-age children. Elements of sports dancing are applied in the training of athletes in certain complex coordination sports. O. Lavrentiev *et al.* (2023) considered the issues of specialised physical training for dancer-athletes. The research determined that in order to improve dancers' skills and ensure successful performances in competitions, it is necessary not only to enhance but also to maintain their physical fitness. For this purpose, when structuring the training process, attention should be paid to both sets of general physical exercises and sets of specific exercises. In the research conducted by S. Veselkina & I. Soronovich (2018), issues related to the formation of blocks (modules) of training exercises with the most effective elements of fitness technologies are revealed. Each of the modules solves certain tasks of physical training and creates prerequisites for successful sports activities for the dancer. Based on the modules, the structure of the training session has been developed, suggesting the integration of these modules into a system of training sessions. T. Osadtsiv *et al.* (2022) presented the results of the study on the specifics of sports activities in ballroom dancing and considered the issue of monitoring the technical preparedness of dance couples. The study examined issues related to improving the system for monitoring the technical preparedness of athlete-dancers aged 12-13 years.

T. Rebrikova (2023) explored the impact of ballroom dancing sessions on an individual's physical health. The research results indicated that ballroom dancing has a

beneficial effect on several aspects of health. The elements of sports ballroom dancing, which engage a large number of muscle groups and cognitive functions, can become more effective compared to traditional physical education lessons. I. Grygus *et al.* (2023) used factor analysis to calculate the correlation of measures to be implemented in the process of dancing for the prevention and correction of posture disorders. D. Zhao (2023) recommended implementing exercises during training to reduce injuries. M.G. Vaccaro *et al.* (2019) conducted research where they studied the effect of dance classes on the physical condition of elderly people. The participants involved in the study attended dance classes 4 times a week for a period of 6 months. Based on the research findings, it was determined that social dance sessions can slow down the ageing process and enhance the socialisation of elderly people. L. Teixeira-Machado *et al.* (2019) demonstrated in their research that individuals engaged in sports dancing have shown improvements in memory, attention, body balance, and psychosocial parameters. The study determined which dances are able to change brain volumes and structures, brain functions, psychomotor adaptation, and levels of neurotrophic factors.

The analysis of literary sources indicated that experts in their studies offered methods to enhance dancers' technical preparation or focused on determining the impact of sports dancing on the human body. However, the studies insufficiently addressed the issues concerning the methods that would help dancers improve the technique of performing dance elements at different stages of training. This led to research in order to find new possible ways to optimise the process of physical and technical training of dancers at the stage of specialised basic training. One possible solution to this issue could be to improve the technical elements of dances of the European programme. The purpose of the study was to scientifically substantiate the methodology of training dancers aged 15-16 aimed at improving the technique of performing dance elements of the European programme at the stage of specialised basic training.

Materials and Methods

Forty dancers, ages 15 to 16, took part in the study. According to the competition guidelines of the International Sports Dance Association, all dancers had class C. The control group (CG) comprised 10 boys and 10 girls, and the basic group (BG) had an identical number of participants. An equal number of boys and girls represented the sample because the research was conducted among dance couples. The study was conducted in Dnipro (Ukraine) based on the sports dance clubs "Elita", "Astra" during 2021-2022. In the BG, the classes were conducted according to the models of training classes developed for it. Models of training sessions

were aimed at developing motor qualities and improving the technical skills of dancers performing elements of the European dance programme. The training models were applied during the preparation period of the basic mesocycle at the stage of specialised basic training. The CG studied according to the curriculum of sports dance clubs. The peculiarity of the training lessons for the BG was the combined use of dancers' physical and technical training means. The dancers' parents gave informed consent to participate in the testing. To protect the health of research participants before and during testing, safety requirements regarding material and technical conditions and the suitability of premises for testing were observed. The study was conducted according to the ethical norms of the Declaration of Helsinki (2013).

The level of dancers' physical preparedness was determined by tests: "Standing long jump, cm", "Push-ups, repetitions", "10-seconds squats, repetitions", "Pump-ups, repetitions", "Gymnastic bridge, cm", "Gymnastic twine, cm", "Foot extension, sitting, cm", "Twist of the gymnastic stick, cm", "15 m run, forward and backwards, s", "Romberg test, s", "Turning 360° on a gymnastic bench in 20 s, repetitions". The determination of special preparedness level was based on an expert assessment of the components of the five types of competitive activities, which were carried out in compliance with the regulations of sports dance competitions. Dance compositions from the basic figures of the European programme were used as special exercises. The work was evaluated by 15 experts – three experts for each component of the dance. The evaluation was conducted on a 5-point scale. The highest score was 5 points, the lowest one was 1 point.

Five components were assessed. Tempo: the degree of steps speed and body movement for a deeper musical filling typical for this dance. The basic rhythm: the performance of dance steps and body movements in accordance with the rhythmic structure of the main figures and elements that are typical for this dance. Body lines: the couple's correct and elegant lines, which correspond to the choreography of ballroom sports dancing. Movement: balance, leading, amplitude and volume of the movement in accordance with the basic rhythmic structure of figures, elements, technical actions and the nature of ballroom dancing. Rhythmic

interpretation: clear expressiveness in the middle of a beat, artistry. Footwork: feet positions; weight distribution on the supporting foot; the direction of legs movement in relation to the body in accordance with the drawing of the figure or element that is being performed; contrary body movement; control of the swing leg movement; placing the feet on a toe, of the foot pad, on the heel, flat – in accordance with the description of figures, elements and technical actions; leg work for lift the body, which is done with raising the foot or without raising the foot; a condition of a swinging and basic leg (straight, bent); the state of the feet in the process of movement according to the dance technique that is performed. The dance classes were held 3 times per week, each class lasted for 90 minutes.

The study results were analysed using statistics on a personal computer using the application statistics package of automated data processing systems STATISTICA 6.0, as well as the spreadsheet editor Excel for Mac-2015. The probability of differences was assessed by the Mann-Whitney U test. The relationships and informativeness of physical preparedness indicators were determined by Spearman rank correlation analysis. The agreement of experts in the assessment of special preparedness was established by the Kendall's coefficient of concordance.

Results

Models of training sessions were proposed in the BG to improve the technical elements of dances of the European programme. The models of training sessions were aimed at the development of motor qualities of dancers and at increasing the technique of dance elements. The peculiarity of the developed models was combined use of physical and technical training means. It allowed to improve the technique of performing separate dance elements; to increase the dancers' special physical preparedness; vary physical loads; reduce fatigue of the higher neuro-motor functions of movement control, which had a positive effect on the technical performance of dance elements. Data analysis of the ascertaining research showed that the dancers of the CG and BG had no differences in physical and special preparedness. The results are shown in Table 1.

Table 1. Assessment of the special preparedness of dancers aged 15-16 when performing the dances of the European programme

Dance name	CG (N = 10)		BG (N = 10)	
	BR	FR	BR	FR
	<i>M ± SD</i>	<i>M ± SD</i>	<i>M ± SD</i>	<i>M ± SD</i>
W	44.60 ± 1.09	50.40 ± 0.58	45.90 ± 0.48	53.90 ± 0.90
T	43.80 ± 0.49	47.60 ± 0.68	46.00 ± 0.42	50.60 ± 0.92
V	45.80 ± 0.98	45.60 ± 0.68	45.70 ± 0.65	52.90 ± 1.01
F	47.70 ± 0.52	49.00 ± 0.69	45.20 ± 0.47	50.50 ± 0.87
Q	47.10 ± 0.40	50.20 ± 0.63	47.10 ± 0.29	54.10 ± 0.53
Overall score	229.70 ± 2.86	232.80 ± 2.60	229.70 ± 1.95	262.00 ± 2.96*

Note: N – number of dancing couples; BR – beginning of the research; FR – finish of the research; W – slow waltz; T – tango; V – Viennese waltz; F – slow foxtrot; Q – quickstep; * – *p* value, *p* < 0.05

Source: calculated by the authors

The correlation of different levels of significance between the indicators of their separate physical qualities and the forms of their manifestation was determined with the aim of rational selection of means and methods of technical

and physical training of dancers. Correlation analysis showed that a large number of statistically significant relationships (*p* < 0.05) belonged to the explosive force, which correlated with strength endurance, speed-strength

and coordination abilities, and mobility of the hip joints (r from -0.523 to 0.906) in boys aged 15-16. Probable positive relationships ($p < 0.05$) were observed among flexibility indicators. Specifically, between the mobility of the ankle joints and mobility in the hip joints (r from 0.801 to 0.948). Hip mobility had inverse relationships ($p < 0.05$) of varying significance with the strength endurance of different muscle groups (r from -0.523 to -0.523). Probable inverse relationships ($r < 0.05$) of different significance were determined between the ability to orient in space with power endurance, explosive power, speed and power abilities, static and dynamic balance (r from -0.530 to -0.886). Speed and power abilities had close probable ($p < 0.05$) relationships with strength endurance, and explosive power (r from 0.544 to 0.849).

A large number of statistically significant relationships ($p < 0.05$) belonged to the indicators of explosive power and strength endurance, speed-strength, and coordination abilities (r from -0.554 to 0.762) in girls aged 15-16. Speed-power abilities had close probable ($p < 0.05$) interrelations with force endurance and explosive force (r from -0.551 to 0.623). Probably positive and inverse relationships ($p < 0.05$) are observed between flexibility and the mobility of the ankle joints and various physical qualities and abilities in girls as well as in boys. These were: explosive force, speed-power abilities, and mobility in the hip joints (r from -0.558 to 0.633). Mobility in the hip joints had positive relationships ($p < 0.05$) of varying significance with strength endurance of different muscle groups (r from 0.519 to 0.645). Also in girls, as well as in boys, there were positive and inverse relationships ($p < 0.05$) of different significance between the ability to navigate in space with strength endurance, explosive power, speed and power abilities, static and dynamic balance (r from -0.515 to -0.863). There were almost no relationships between mobility in the ankle and spine joints, hip and shoulder joints, both in girls and boys.

Correlation analysis showed the significant importance of speed-power abilities in young men who go in for sports dances. Using exercises that are aimed at developing speed-strength, coordination abilities, and flexibility was advisable during one training class for young men. A significant importance has been defined in the level of explosive strength in girls aged 15-16 who participate in the sports dancing. Using exercises that are aimed at developing strength endurance and coordination abilities was recommended during one training class for girls. In addition, it is necessary for both boys and girls to develop mobility in all joints during the training session.

The data obtained during the correlation analysis and determining the level of dancers' preparedness allowed to develop models of training sessions. These models were aimed at developing motor skills and improving the technical skills of performing dance elements of the European dance programme. They formed the basis for the construction of the training process among dancers aged 15-16 in the preparatory period of the basic mesocycle at the stage of specialised basic training. According to the developed models, there was a combined use of means of physical and technical training at each lesson. Various comprehensive "blocks" of the physical load were selected for the dancers. Additional tasks of physical training were solved

in some "blocks" of the physical load. Leading exercises and separate figures of the dances of the European programme were selected in other "blocks" of the physical load. This helped to improve the dancers' technical proficiency. Classes were aimed at studying and improving the technique of complex coordination motor actions in the European dance programme. The tasks of increasing the level of strength, special endurance, coordination, flexibility, and expanding the adaptive capabilities of the aerobic energy resources of the dancers' organisms were solved at the lessons. Increasing the aerobic productivity of the dancers aged 15-16 during training was provided by a constant change in the direction of the physical load.

The training class for the European dance programme consisted of preparatory, main, and final parts. The preparatory part lasted 20 minutes. During the preparatory part, choreography exercises were performed. The heart rate during the exercises was in the range of 100-130 beats per minute (bpm). The main part of the lesson consisted of three blocks. In the first block, elements of one of the dances of the European programme (W, T, V, F, Q) were performed to improve the technical elements, depending on the objectives of the lesson. The first block lasted 25 minutes. Leading exercises to improve technical elements were selected. Elements of the figures were performed at different tempos, with a fixation of points and an accent of attention. Attention was focused when holding the lines of the body, when performing a swing movement, when working out the swing and shape, when Man and Lady were standing in the correct position in the couple, and when working with the foot. When mastering and practicing dance elements, the technique of performing exercises in whole and in part was used.

Almost all dances in the European programme except tango dance are sometimes called "swing dances". Swing in dance, often called pendulum motion, is important for elegant dance with good balance. Studies by T. Shioya (2018) have shown that swing does not depend on the length and weight of the dancer. To perform the swing movement correctly, it is necessary to use the muscles and correct feet work. H. Smith-Hampshire (1996) noted that when performing dances such as slow waltz, Viennese waltz, foxtrot and quickstep, it is necessary to make sure that the feet are elastic and in a good muscle tone. The feet should keep parallel lines. It is necessary to define clearly the trajectory of movement and the rhythmic performance of the movement in music. The position in the couple and the smoothness of the movement are important as well as the creation of the movement impulse using the body swing method.

To improve the technique of performing figures in addition to figures of competitive variations, dancers practiced basic dance figures in the first block of the training model: slow waltz (natural turn, reverse turn, natural spin turn, double back spin); Viennese waltz (natural turn, reverse turn); quickstep (natural pivot turn, lockstep forward, lockstep back, running turn); foxtrot (feather step, three steps, natural rotation, reverse rotation). The basic figures were performed both separately and combined in educational variations. H. Smith-Hampshire (1996) indicated the body swing method of movement depends on the correct balance of the body to leverage the effect of gravity as an auxiliary element for movement during the execution of

steps by controlling the conscious synchronous use of the propulsive power of the supporting leg and foot.

For the correct work of the foot in the first block, soft ascents and descents were practiced both in couples and individually. When performing dance steps, attention was concentrated on the work of the dancer's foot: the foot should pass by the other foot with the "brush"; when moving from one position to another, the feet should remain parallel from one to another and not deviate outward. To increase the tone of the leg muscles, strengthen the foot muscles, and develop lightness and jumping, the dancers were asked to perform a variety of jumps with a skipping rope and force weights, as well as options for syncopated jumps from the quickstep dance.

Due to the movement in standard dances having a specific orientation in the hall for each figure, the execution of both separate figures and the connection of the figures with the observation of the necessary body and foot turns while moving along an oriented trajectory were practiced before performing one or another variation in the first block. Attention was paid to maintain perfect balance. To develop a sense of balance, the dancers were recommended to perform rolls from toe to heel across the entire foot, while it was necessary to maintain the correct position of the body, which is typical for the Man and for the Lady. The dancers performed steps in balance and in semi-balance with movement in front and back. In performing these steps, much attention was paid to the work of the foot and knees. The exercise was performed both individually and in couple. To maintain and improve balance, the dancers kept a book or similar object on their heads while dancing basic figures in one or more dances.

For the correct placement in the dance couple of one partner in relation to the other, exercises that are aimed at maintaining contact and keeping a balanced position in the dance couple were performed. Furthermore, for the correct acceptance of the position in the couple, the dancers repeatedly stood in the correct individual position before the practice of variations of a particular dance began. For perfect technical performance of figures in swing dances, the Man must achieve the correct feeling in the knees, namely the feeling of vertical "stretching" and increased muscle tone, but there should be no tension or stiffness at any point of maximum rise. In order to achieve this feeling, as an exercise, the dancers were asked to bring their knees back as much as possible, then relax their knees and bring them forward slightly. The exercise was performed both individually and as a couple.

An important factor in achieving the body's natural response to the centrifugal force of the figures where rotations are used is the flexibility of the Lady's back. Therefore, in the first block of the final part of the training class, exercises were performed to develop flexibility. In addition, in the first block of the main part, such exercises as sway (lateral deviation of the dancers' bodies, when the Man and the Lady not only keep their balance but also create a spectacular appearance) and oversway (movement created on the basis of the dance element of the sway) were used (Pavliuk, 2018). Attention was paid to how the Man was able to demonstrate the line of the Lady. The exercises aimed at the ability of a dance couple to maintain volume (working out the shape) were selected.

An important aspect of improving the technique of performing elements of the European programme dances was the achievement of smoothness in the performance of these elements by the dancers. H. Smith-Hampshire (1996) indicated that smoothness of movement should be achieved when the dancer is moving over the floor from one leg to the other. It is necessary for the dancer to achieve smoothness of rotational movement (turns and spins), smoothness of body rise and fall, and smoothness of body vertical axis deviation from the perpendicular. In the BG, during training, each type of smoothness was practiced both independently, with the help of leading exercises and the performance of individual poses and dance elements, and during the performance of educational and competitive variations.

The level of dancers' technical skills depends on their physical preparedness and functional reserves of the body. Therefore, the second block was aimed at the development of physical qualities and the expansion of the adaptive and functional capabilities of the body. The duration of the second block was 20 minutes. The content of the second block depended on the tasks of the training class and on the content of the first block. This allowed to pay attention to the improvement of the technique of some dance elements. During the second block, there were two "training laps" of the European programme. The first "training lap" consisted of five dances: slow waltz, tango, Viennese waltz, foxtrot, and quickstep. Each dance was performed for 90 seconds. There was a 30-second break between the dances. After the first dance, the dancers did flexibility exercises for five minutes, which promoted partial recovery and improved muscle elasticity. During the second "training lap", the dancers performed the European programme dances, but the choice of the dance depended on the physical qualities the dancers needed to develop during a particular training session. The break between the dances was 30 seconds. During these 30 seconds, the dancers performed walking and breathing exercises.

During the second "training lap", a Viennese waltz was performed for 60 seconds to improve the dancers' coordination abilities and their vestibular apparatus. Quickstep was performed for 90 seconds after each dance to improve the dancers' speed skills. A slow foxtrot or tango was performed for 90 seconds after each dance to develop the dancers' sense of spatial orientation and rhythmic interpretation. A slow waltz was performed for 90 seconds after each dance to improve the dancers' body line and footwork. In the second block, in addition to improving the technique of performing the elements of a particular dance in a variation, the issues of revealing the aerobic mechanisms of the dancers were addressed. This allowed them to increase the level of their endurance. To develop special endurance in the second block during the second "training lap", a force weights in separate training sessions were used.

The third block of the main part (lasting 10 minutes) was aimed at developing dynamic balance. Dancers performed translational, rotational movements, pivots, both in a couple and individually. The final part of the lesson consisted of two blocks. The first block lasted seven minutes. During the first block, the dancers performed exercises to develop flexibility. The heart rate of the dancers was 100-130 bpm. In the second block, breathing exercises and relaxation exercises were selected. This helped to restore the dancers and relieve tension after intense training.

The heart rate of the dancers during the second block of the final part was 80-100 bpm. To substantiate the improvement of the technique of performing elements of the European programme dances, a comparative analysis of the physical and technical preparedness of dancers aged

15-16 in CG and BG before and after the research was conducted. The results of the formative research showed that there are differences among a number of indicators of the physical preparedness of boys and girls 15-16 years old in CG and BG (Table 2).

Table 2. Indicators of physical preparedness of dancers aged 15-16 in the BG and CG before and after the research

Test event	Boys						Girls					
	CG (N = 10)			BG (N = 10)			CG (N = 10)			BG (N = 10)		
	BR M±SD	FR M±SD	p	BR M±SD	FR M±SD	p	BR M±SD	FR M±SD	p	BR M±SD	FR M±SD	p
Standing long jump, cm	198.00±6.86	206.02±5.75	<0.05	199.30±3.88	224.50±3.28	<0.05	162.75±1.69	165.90±3.15	<0.05	162.10±1.76	173.80±1.96	<0.05
Push-ups, repetitions	29.60±4.69	30.80±1.69	ns	30.50±1.48	36.10±2.21	<0.05	8.80±0.58	9.00±0.50	ns	9.50±0.70	10.60±0.55	<0.05
Pump-ups, repetitions	41.90±1.43	44.50±3.91	<0.05	42.10±4.19	52.90±4.86	<0.05	37.40±2.37	40.10±2.67	<0.05	37.40±2.39	40.40±3.14	<0.05
10-seconds squats, repetitions	10.50±0.39	11.60±0.32	ns	11.80±0.60	14.40±0.32	<0.01	9.40±0.23	9.90±0.26	ns	9.30±0.32	12.40±0.23	<0.01
Gymnastic bridge, cm	53.70±1.91	52.60±1.84	ns	53.10±2.35	46.10±2.06	<0.05	35.84±2.54	34.50±2.42	ns	33.90±2.10	31.00±1.83	<0.05
Gymnastic twine, cm	30.30±1.91	29.0±2.37	ns	29.60±2.02	25.55±2.95	<0.05	10.70±1.08	9.90±0.91	ns	9.60±0.74	7.20±0.73	<0.01
Foot extension, sitting, cm	9.20±0.34	8.70±0.27	ns	9.05±0.74	7.20±0.66	<0.01	6.45±0.49	6.20±0.47	ns	6.40±0.32	4.85±0.31	<0.01
Twist of the gymnastic stick, cm	75.44±1.35	73.58±5.92	ns	74.30±3.98	67.90±4.96	<0.05	51.05±0.93	50.17±1.63	ns	52.10±1.20	47.50±1.17	<0.05
Romberg test, s	20.00±1.68	21.20±2.08	ns	21.30±1.85	28.10±1.79	<0.01	21.30±1.60	20.70±1.85	ns	22.70±1.55	26.60±1.31	<0.05
15 m run, forward and backwards, s	1.24±0.07	1.20±0.06	ns	1.21±0.05	0.99±0.05	<0.01	1.12±0.10	1.10±0.09	ns	1.15±0.05	1.04±0.06	<0.05
Turning 360° on a gymnastic bench in 20 s, repetitions	4.10±0.17	4.65±0.16	ns	4.45±0.21	5.25±0.28	<0.05	4.75±0.32	4.95±0.27	ns	5.10±0.32	5.90±0.28	<0.05

Note: BR – beginning of the research; FR – finish of the research; ns – not significant; N – number of persons

Source: calculated by the authors

Analysis of the results showed that by the end of the research the dancers in the BG had statistically significant changes in the following tests: “Standing long jump” – for girls by 7.22% ($p < 0.05$), for boys by 12.64% ($p < 0.05$); “Pump-ups” – for boys by 20.41% ($p < 0.05$); “10-seconds squats” – for girls by 25.00% ($p < 0.01$), for boys by 18.05% ($p < 0.01$); “Gymnastic bridge” – for boys by 15.18% ($p < 0.05$), “Gymnastic twine” – for girls by 33.33% ($p < 0.01$), for boys by 15.86% ($p < 0.05$); “Foot extension, sitting” – in girls by 31.96% ($p < 0.01$), in boys by 25.69% ($p < 0.01$); “Romberg test” – in boys by 24.20% ($p < 0.01$); “15 m run, forward and backwards” – in girls by 10.58% ($p < 0.05$), boys by 22.22% ($p < 0.01$); “Turning 360° on a gymnastic bench in 20 s” – for girls by 13.56% ($p < 0.05$), boys by 15.23% ($p < 0.05$). The dancers in the CG had statistically significant changes in tests: “Standing long jump” – in boys by 4.05% ($p < 0.05$), “Pump-ups” – in girls by 7.21% ($p < 0.05$), in boys by 6.21% ($p < 0.05$), which is a predictable result because at the age of 15-16, favourable conditions for the development of strength and speed-power abilities continue.

By the end of the study, dancers aged 15-16 showed statistically significant differences in scores, both among

individual dances and in the total amount. Data analysis in the beginning and at the end of the research showed that the dancers of the BG had a statistically significant increase in indicators of special preparedness. The overall score for five dances of the European programme in the BG increased by 32.3 points, which is 12.25% ($p < 0.05$), and in the CG – by 13.10 points, which is 5.39% (Table 1). A significant improvement in the BG was observed in the performance of the dances: slow waltz, Viennese waltz, foxtrot. The agreement among experts in the assessment of special preparedness was established by the Kendall’s coefficient of concordance. Both at the beginning of the research and at the end of the research, the degree of agreement of experts was defined as high. At the beginning of the research, the coefficient was 0.756 ($p < 0.05$), and at the end of the research, it was equal to 0.745 ($p < 0.05$). Comparative analysis and study of the dynamics of physical and special preparedness of dancers aged 15-16 at a stage of specialised basic training testified to the high efficiency of the application of the developed models of training classes with the combined use of means of physical and technical training for the improvement of the technique of elements of the European programme dances.

Discussion

During the study, models of training classes for dancers aged 15-16 were developed. These models were aimed at the development of dancers' motor abilities and to increase the technical skill of dance element execution. In these models, the combined use of means of physical and technical training was applied. According to the developed models in the training classes, there was an alternation of exercises for the development of physical abilities and exercises to improve the technique of the execution of separate dance elements. This alternation of exercises made it possible to vary the load to different intensities. This allowed to reduce fatigue of higher neuro-motor functions of movement control, which had a positive effect on the technical performance of dance elements, and to solve the problem of increasing the level of strength and special endurance, coordination and flexibility. These results confirmed the data from H. Ji (2022). The author noted that the technicality of each dance movement was the foundation of the dance itself. During the execution of dance elements, dancers constantly adjust their muscle groups. This is associated with corresponding functional processes in the human body. Therefore, for dancers, it was advisable to employ functional training, the main components of which included: strength training; endurance to assist dancers in executing dance movements from start to finish; coordination abilities; technical skills aiding in figure execution; and proper partner sensing and pairing.

In the study, the combined use of physical and technical training during training classes has been proposed. For this purpose, various complex "blocks" of the physical load were selected. In some "blocks" of the physical load, additional physical training tasks were solved. In other "blocks" of the physical load, the leading exercises and separate figures of the European programme dances to improve the dancers' technical proficiency were selected. The proposed combined use of physical and technical training was consistent with the research of other specialists. J.P. Ambe-gaonkar *et al.* (2021) argued that it is necessary to incorporate several exercises into training aimed at developing physical and technical abilities to enable a dancer to fully realise their potential in performing dance composition.

The study determined the level of physical and specialised preparedness of dancers, as well as the correlation of varying degrees of significance between indicators of individual physical and functional abilities. The obtained results were used in the construction of the training process of dancers aged 15-16 in the preparatory period of the basic mesocycle at the stage of specialised basic training. Data from M.F. Grigore *et al.* (2019) was supported by the received results. They demonstrated in their research that sports training is a systematic process that requires planning and consideration of not only preparation periods and competition calendars but also real-time information regarding the level of physical and functional indicators of dancers.

To improve the technical elements, lead-up exercises were selected in the study. Elements of the figures were performed at different tempos, with a fixation of points and an accent of attention. Attention was focused when holding the body lines, when performing a swing movement, when working out the swing and shape, when taking the correct position in a couple, and when working with the

foot. In addition to the figures of competitive variations, the dancers practiced the basic figures of dances: slow waltz, Viennese waltz, quickstep, foxtrot, as individually as well as conjunctive educational variations. The dancers performed: steps in balance and half-balance with forward and backward movement – while performing these steps to improve balance, the dancers held a book or similar object on the head; dancing steps with an emphasis on footwork and on gentle rise and fall. This is confirmed by the opinion of G. Sun (2022), who identified the necessity of constantly improving the specific technical and physical preparation of dancers. And proposes implementing innovative methodologies that will enrich the theoretical knowledge of dancers for their understanding and mastery of the technical characteristics of various dances.

Depending on the tasks of the training class to develop physical abilities and expand the adaptive and functional capabilities of the body, the dancers performed two "training laps" of the European programme dances. The first "training lap" corresponded to the conditions of competitive dance performance. During the second "training lap", five dances from the European programme were performed. Between dances, depending on the objectives of the training class, one of the dances of the European programme was performed additionally. In order to develop special endurance in the performance of dances during the second "training lap", the dancers used force weights in separate training classes. The same methodological approach has also been identified in the studies of other experts. M.F. Grigore *et al.* (2022) provided in their research a set of specialised exercises to enhance competitive choreography for dancers. The proposed module consisted of 10 exercises performed under various conditions, utilising additional equipment and variations in musical accompaniment. In the study, the level of dancers' specialised preparedness was also identified, but it was not taken into account their previous level of physical preparedness.

In the BG, the training session consisted of preparatory, main, and final parts. In the preparatory part of the training session, choreography exercises were performed. The main part of the training session included three "blocks" of different orientations. In the first "block" the task of raising the level of dancers' technical readiness was solved. In the second "block" the tasks of improving dancers' physical preparedness were settled. Elements of the European programme dances and physical exercises were used for this purpose. In the third "block", the emphasis was on the development of dynamic balance. The final part of the lesson consisted of two "blocks" and was aimed at restoring the dancers and relieving tension after intense training. In the BG, individual dance elements and exercises for the development of coordination abilities and flexibility were used during the training class in the breaks between high-intensity workouts. The results of the study indicated that this training class improved the level of physical and technical preparedness of the BG dancers. This confirmed the data of O. Kaluzhna *et al.* (2022), who suggested allocating various types of physical training tools based on the dancer's level of physical preparedness. This made it possible to effectively solve tasks related to both the development of physical abilities and the improvement of technical mastery.

At the end of the study, dancers showed improvements in strength, endurance, flexibility, and coordination. This is supported by the findings of A.M. Clifford *et al.* (2023), who demonstrated in their study that dance sessions positively influence physical abilities such as flexibility, strength, and endurance. S. Douka *et al.* (2019) also indicated that dance lessons improved coordination abilities, flexibility, and strength. The stage of specialised basic training needs special attention. At this stage, a sufficiently high level of sportsmanship was provided, and comprehensive prerequisites for intensive specialised training at the next stage were formed. The goal of the next stage is to achieve the highest results. The growing popularity of sport dances requires the development and scientific and methodological substantiation of specific methods of various types of training for dancers.

Conclusions

The data obtained during the correlation analysis between indicators of dancers' individual physical abilities allowed for the development of training models aimed at enhancing athletes' technical skills. The application of training models combined with the use of physical and technical preparation tools to improve the technique of performing elements of the European dance programme contributed to the improvement of the physical and specialised preparedness indicators of dancers aged 15-16 during the stage of specialised basic training.

The use of the developed training models had its own peculiarities and advantages. Performing exercises to enhance active and passive flexibility during intervals between each "training lap" contributed to improving joint mobility and created optimal conditions to maintain the necessary range of motion when performing specific

exercises. Performing small sets of strength exercises at the beginning of the class, speed development exercises, and flexibility exercises created favourable conditions for the development of specific abilities. The physical exercises used in the specialised warm-up, sharing similar dynamics and kinematic structure with the primary technical actions of the dancer, contributed to the improvement of the dancer's technical proficiency. Using exercises at the end of the training session aimed at restoring the overall specific endurance of dancers allowed for the successful achievement of enhancing their efficiency, which also positively affected the improvement of the dancers' technical proficiency.

Additional performance of basic elements of the European dance programme, executing dance compositions at different tempos, and varying dance elements when performing compositions contributed to the improvement of the technical and physical readiness of dancers and allowed for an increase in their endurance level. The practice of dancers in the role of supporting exercises, steps moving forward and backward in balance and semi-balance with an emphasis on footwork, knee work, and maintaining posture, made it possible to improve technical performance in executing elements of the slow waltz and foxtrot dances. Prospects for further research could include improving the technique of performing dance elements of the Latin programme for dancers aged 15-16 at the stage of specialised basic training.

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Conflict of Interest

None.

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Удосконалення техніки виконання елементів спортивного танцю танцюристів 15-16 років на етапі спеціалізованої базової підготовки

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Анотація. Специфіка сучасних спортивних танців вимагає високого рівня підготовленості, здатності до максимальної концентрації, чіткого виконання динамічних рухів та їх біомеханічної оптимізації. Особлива роль при побудові тренувального процесу відводиться технічному виконанню елементів танців європейської програми. Тому метою дослідження було наукове обґрунтування вдосконалення техніки виконання елементів танців європейської програми та створення відповідних методик занять для танцюристів 15-16 років на етапі спеціалізованої базової підготовки. У дослідженні брали участь 40 спортсменів віком 15-16 років категорії «С» згідно з правилами змагань Міжнародної асоціації спортивного танцю. Рівень спеціальної підготовленості визначався шляхом експертної оцінки компонентів п'яти видів змагальної діяльності. Розроблено моделі тренувальних занять, які спрямовані на розвиток рухових якостей і підвищення технічної майстерності виконання танцювальних елементів європейської програми танців. Відповідно до розробленої моделі, на кожному занятті відбувалося сполучене використання засобів фізичної й технічної підготовки за рахунок підбору комплексних «блоків» навантаження, в яких вирішувалися додаткові задачі фізичної підготовки, та «блоків», у яких підбиралися підвідні вправи й окремі фігури танців європейської програми для вдосконалення технічної підготовленості. Встановлено, що доцільно застосовувати різноманітні підвідні вправи, виконувати елементи танцювальних фігур у різному темпі й із фіксацією точок у відповідному положенні, свінгові рухи та кроки в балансі та в півбалансі з рухом у різних напрямках, відпрацьовувати свей та шейпи, застосовувати різноманітні стрибки й варіанти прогонки: прогонку, яка відповідає умовам конкурсного виконання танців, і прогонку, впродовж якої між кожним танцем виконується додатковий танець у залежності від спрямованості заняття. Результати дослідження можуть допомогти фахівцям зі спортивних танців покращити тренувальний процес танцюристів

Ключові слова: моделі тренувальних занять; європейська програма; пари; свінг; баланс; півбаланс