21. Dovgan NU. Physical education of University students in the process of extracurricular sports and mass work. Collection of scientific works of Kherson state University. Pedagogical Sciences, 2016;71(2):53-58.

22. Khudoli O.M., Ivashchenko O.V., Chernenko S.O., Simulation of junior schoolchildren’s training to acrobatic exercises and vaults. Pedagogics, psychology, medical-biological problems of physical training and sports, 2015;7:64-71. http://dx.doi.org/10.15561/18189172.2015.0709.

23. Kasatkina NA. Model of technical readiness development in sports aerobics. Pedagogy, psychology and medico-biological problems of physical education and sport., 2015;2(35):46-53 DOI 10.14526/01_1111_06

24. Razumova L. V. the Main directions of perfection of sports skill in sports aerobics. Pedagogical-psychological and medical-biological problems of physical culture and sport, 2013;3(28):196-201.

Information about the authors

Kravchuk T.M.
tatyana1409@gmail.com
https://orcid.org/0000-0002-6370-4000
H.S. Skovoroda Kharkiv National Pedagogical University
street Alchevskikh, 29, Kharkiv, 61002, Ukraine

Bybel S.A.
svetyli4ka2685@gmail.com
https://orcid.org/0000-0001-6725-3908
H.S. Skovoroda Kharkiv National Pedagogical University
street Alchevskikh, 29, Kharkiv, 61002, Ukraine

Slastina O.O.
slastinaelena8@gmail.com
https://orcid.org/0000-0003-4001-5242
Kharkiv Trade and Economics institute
Otakara Yarosha Lane, 8, Kharkiv, Ukraine, 61000

Kovalenko A.I.
anastasiakov27@gmail.com
H.S. Skovoroda Kharkiv National Pedagogical University
street Alchevskikh, 29, Kharkiv, 61002, Ukraine

Kравчук Т.М.
tatyana1409@gmail.com
https://orcid.org/0000-0002-6370-4000
Харківський національний педагогічний університет імені Г.С. Сковороди
вул. Алчевських, 29, м. Харків, 61002, Україна

Бибель С.А.
svetyli4ka2685@gmail.com
https://orcid.org/0000-0001-6725-3908
Харківський національний педагогічний університет імені Г.С. Сковороди
вул. Алчевських, 29, м. Харків, 61002, Україна

Сластина О.О.
svetyli4ka2685@gmail.com
https://orcid.org/0000-0001-6725-3908
Харківський торговельно-економічний інститут
Київського національного торговельно-економічного університету
провулок Отакара Яроша, 8, Харків, Харківська область, 61000

Коваленко А.І.
anastasiakov27@gmail.com
Харківський національний педагогічний університет імені Г.С. Сковороди
вул. Алчевських, 29, м. Харків, 61002, Україна

Received: 10.06.2020

Принята в редакцию: 10.06.2020
Influence of means of parterre gymnastics on physical fitness of young athletes in acrobatic rock and roll

Krvavchuk T.M., Golenkova Yu.V., Sanzharova N.M., Katrechko I.B.

H.S. Skovoroda Kharkiv National Pedagogical University

DOI: https://doi.org/10.34142/HSR.2020.06.03.02

Abstract
The aim: to determine the effectiveness of the use of parterre gymnastics for physical training at the initial stage of long-term training in acrobatic rock and roll.

Material and methods. The study involved 28 children 6-7 years (14 girls and 14 boys) engaged in acrobatic rock and roll the first year. Research methods: Study and analysis of scientific and pedagogical literature; analysis of the curriculum for acrobatic rock and roll, rules and videos of competitions; interview of coaches; pedagogical experiment; pedagogical control tests (testing); methods of mathematical statistics.

Results. As a result of the study, a statistically significant positive effect of parterre gymnastics exercises on the level of development of individual physical abilities of young athletes was revealed. Introduction to the educational and training process of young athletes engaged in acrobatic rock and roll at the initial stage of long-term training, the exercises of parterre gymnastics of a plot orientation are selected. Implemented in the initial training groups. High efficiency of use of means of orchestra gymnastics for development of mobility in hip joints, strength of muscles of a trunk and legs and coordination of movements at children of primary school age who are engaged in acrobatic rock-n-roll at the initial level is experimentally proved.

Keywords: outdoor games, cheerleading, primary school students, physical abilities, speed, agility, strength, ability to rhythmic activity.
Introduction

Acrobatic rock and roll is a complex and coordinated sport that is constantly evolving and gaining more and more fans and those involved in Ukraine and the world. The beauty, dynamism and emotionality of this sport provide it with spectacle, but require athletes to develop a wide arsenal of abilities at the initial stage of long-term training.

According to the analysis of the special literature, the process of training athletes in acrobatic rock and roll at the initial stage of their sports careers has repeatedly been the subject of scientific research. The system of training process at the stage of initial training in acrobatic rock ‘n’ roll on the basis of experimental check of efficiency of application of complexes of target orientation on kinds of preparation and the analysis of structural components of training process [1] were subject to substantiation and detailed consideration.

There are works devoted to certain aspects of training young athletes in acrobatic rock ‘n’ roll, in particular, the peculiarities of the development of coordination skills in athletes of acrobatic rock ‘n’ roll aged 7-8 years [2]; methods and organizational forms of dance training of athletes (6-9 years) in acrobatic rock and roll [3]; improvement of technical training by determining the biomechanical characteristics of the performance of the main course kick in acrobatic rock ‘n’ roll [4]; features of choreographic training [5].

Some aspects of the organization of the educational and training process of qualified athletes in acrobatic rock ‘n’ roll were subject to research. In particular, the means and methods of special physical and technical training of athletes in this sport in the annual macrocycle were studied [6]; criteria for selection and prediction of sports improvement in acrobatic rock ‘n’ roll [7], means to increase the efficiency of the training process in acrobatic rock ‘n’ roll [8].

The study of a wide range of special-methodical literature also showed the presence of a curriculum in acrobatic rock ‘n’ roll approved by the Commission on Education of Pupils and Students of the Scientific and Methodological Council for Education of the Ministry of Education and Science of Ukraine (Minutes № 5 from 23.12.2010). ) [9]; methodical recommendations on the organization and conduct of training sessions in dance sports [10], the manual "Acrobatic rock and roll" [11] and programs for studying acrobatic rock and roll in grades 1-4 of secondary schools [12].

However, despite the large number of works devoted to improving the training process at the stage of initial training in acrobatic rock ‘n’ roll, the use of floor gymnastics as a means of effective training in this sport is still underdeveloped.

The aim: to determine the effectiveness of the use of floor gymnastics for physical training at the initial stage of long-term training in acrobatic rock and roll.

Objectives of the study:
- Based on the analysis of the curriculum in acrobatic rock ‘n’ roll, special methodological literature and a survey of coaches to identify the physical abilities necessary for the effective training of young athletes in this sport.
- Choose floor gymnastics exercises that can promote the development of these abilities in acrobatic rock ‘n’ roll and implement them in initial training groups.
- Experimentally test the effectiveness of the use of ground gymnastics in the process of physical training of athletes in acrobatic rock ‘n’ roll at the initial stage.

Material and methods

Participants

The study involved 28 children aged 6-7 years (14 girls and 14 boys) who were engaged in acrobatic rock and roll in the first year. From them the control (n = 14) and experimental (n = 14) groups with the same number of girls and boys (n = 7) were formed. The research was conducted in the sports club of acrobatic rock and roll "Rock Stars" (Kharkov).

Research methods

The study and analysis of scientific and pedagogical and special methodological literature helped to determine the degree of research of the problem; analysis of the acrobatic rock ‘n’ roll curriculum, rules and video recordings of the competitions helped to identify the physical abilities needed to create a solid foundation for the technical training and further growth of young athletes in the sport; the survey of trainers made it possible to identify the tasks of physical training and the priority of using the means of developing physical abilities at the initial stage of long-term training; the pedagogical experiment was conducted in order to identify the impact of the proposed means of ground gymnastics on the development of physical abilities of young athletes; using the method of pedagogical control tests (testing), we identified the level of development of physical abilities of the subjects at
the beginning and end of the experiment, in particular:

- flexibility: leaning forward from a sitting position (cm), twine on the right leg (cm), twine on the left leg (cm) and transverse twine (cm);
- forces: flexion of extension of arms in an emphasis lying on a floor (number of times); lifting the torso to the side from a supine position for 1 minute (number of times) and lifting straight legs in the axis (number of times);
- ability to maintain balance: static - according to the method of Bondarevsky with open eyes (c); dynamic - time of 4 turns on the narrow side of the gymnastic bench (c);
- coordination of movements: time of performance of three forward throws (c);
- control of the sense of rhythm: rhythmic movements of the upper and lower extremities (number of cycles of movements for 20s.)

The technology of testing is presented in the work of LP Sergienko [13].

Statistical analysis

Methods of mathematical statistics were used to process the results of tests obtained during the study. Thus, for each indicator the arithmetic mean value, standard deviation (S) (standard deviation), coefficient of variation (V) and estimation of the probability of discrepancies between the parameters of the initial and final results by Student's t-test with the corresponding probability level (p) were determined.

Results

As a result of a survey of coaches in acrobatic rock 'n' roll (interviewed only 12 people) and analysis of previous research to determine the priority of the development of physical abilities in this sport [1, 14] it was determined that for successful competitive activities in acrobatic rock and roll role at the initial stage of training requires a uniform harmonious development of physical abilities such as flexibility, agility, strength and a large arsenal of coordination skills.

To optimize the development of these abilities, we have developed three sets of exercises for ground gymnastics. Parterre gymnastics, as a revolutionary technique in the field of choreography, was proposed in the middle of the 20th century by dancer, choreographer and teacher Boris Knyazev. Its essence is that the exercises of classical choreography were performed lying down or sitting on the floor. Ground floor gymnastics of Boris Knyazev was aimed at the development of elasticity of ligaments, strengthening the muscles of the lower extremities, good posture, stability, good coordination of movements [15, 16].

In view of this, the exercises for the experiment were selected in such a way that gradually taught young athletes to control their bodies, from the toes to the fingers. Given the younger school age of the subjects, the complexes had a plot color and were combined under the name "birth of a butterfly".

Thus, the first set of "caterpillars" included exercises performed from a supine position and on the abdomen with straight as tense legs and arms. In particular, the complex included flexion of the toes, feet, lifting of the straight legs and torso by 30-45? alternately and simultaneously, from a supine position, lifting the pelvis with support on the shoulders and heels, tilting the torso forward from a sitting position; emphasis lying on the thighs bent, exercises in the emphasis lying on the forearms. Exercises were performed at different speeds in dynamic mode and with a delay of up to 8 counts

The second complex "doll" was also performed from a supine position, but most exercises were performed in a position or from a grouping position. Among the exercises of this complex are the following: grouping from a supine position to a sitting position and squatting, grouping from a supine position; roll in grouping both around the horizontal and around the vertical axis of the body, "basket", "frog" and roll over and back from different starting positions.

The third complex "butterfly" was performed from a supine position on the back, abdomen and side and included high-amplitude swings forward, sideways, backward, jerks with straight legs in straight and transverse twine; circles with straight legs.

The developed complexes were offered to young athletes who were part of the experimental group for 3 months from September to November 2018. Exercises were performed during the warm-up with the obligatory musical accompaniment, which included children's songs and classical music with a size of 4/4 or 2/4. Each month, the number of repetitions of exercises in the complexes increased by 4-8. From the very beginning of inclusion in employment exercises of complexes were repeated on 8-10 times depending on complexity and amplitude. A total of 39 classes were conducted using the developed complexes. 15 to 25 minutes were allotted directly to the complexes in the lesson. Athletes of the experimental group attended traditional classes aimed mainly at learning the technique of dance exercises.
Analysis of indicators of physical fitness in the studied control and experimental groups at the beginning of the experiment showed their homogeneity (Table 1-2). A study of selected indicators of physical fitness of young athletes at the end of the experiment showed their growth in both groups under the influence of training loads. However, statistical processing of the study results showed the probability of this growth only in the experimental group for individual indicators (Table 2).

In particular, the most statistically significant increase in the experimental group occurred in flexibility. Thus, the lean forward test index improved in girls by 45% and in boys by 41%; twine on the right leg - 42% of girls and 38% of boys; twine on the left leg - 27% for girls and 32% for boys; transverse twine - for girls by 28%, boys by 26%.

Among the indicators of strength, statistically significant improvement in the experimental group were indicators: lifting the torso to the side for 1 min. 29% for girls and 26% for boys; raising straight legs at the waist for girls by 33%, boys - 28%. In our opinion, this growth is not accidental, as most of the exercises of ground choreography are aimed at strengthening the abdominal muscles, as important factors in forming the correct posture and foundation for mastering the elements of rock 'n' roll.

Table 1

| Indicators of physical fitness | Gender | Before the experiment | After the experiment | t       | p     |
|-------------------------------|--------|-----------------------|---------------------|---------|-------|
| Lean forward, cm              | Boys   | 3.1 ± 0.55            | 4.4 ± 0.62          | 1.6     | p>0.05|
|                               | Girls  | 4.1 ± 0.93            | 6.1 ± 0.86          | 1.6     | p>0.05|
| Twine on the right leg, cm    | Boys   | 18.3 ± 1.71           | 13.7 ± 1.65         | 1.9     | p>0.05|
|                               | Girls  | 14.1 ± 1.64           | 10.0 ± 1.25         | 2.0     | p>0.05|
| Twine on the left leg, cm     | Boys   | 18.7 ± 1.81           | 14.9 ± 1.30         | 1.7     | p>0.05|
|                               | Girls  | 15.0 ± 1.53           | 11.1 ± 1.04         | 2.1     | p>0.05|
| Transverse twine, cm          | Boys   | 17.7 ± 3.08           | 12.0 ± 2.68         | 1.4     | p>0.05|
|                               | Girls  | 14.4 ± 3.26           | 10.3 ± 2.50         | 1.0     | p>0.05|
| Flexion of the arm extension in the supine position, the number of times | Boys | 7.6 ± 1.29 | 9.9 ± 1.19 | 1.3 | p>0.05 |
|                               | Girls  | 4.6 ± 1.37            | 6.4 ± 0.62          | 1.2     | p>0.05|
| Lifting the torso to the side in 1 minute (number of times) | Boys | 19.9 ± 1.91 | 25.3 ± 1.58 | 2.2 | p>0.05 |
|                               | Girls  | 18.1 ± 1.88           | 23.3 ± 2.17         | 1.8     | p>0.05|
| Lifting straight legs in height, the number of times | Boys | 17.0 ± 2.35 | 23.3 ± 2.14 | 2.0 | p>0.05 |
|                               | Girls  | 14.6 ± 2.83           | 21.3 ± 2.75         | 1.7     | p>0.05|
| Static equilibrium with open eyes, s | Boys | 13.7 ± 2.18 | 20.7 ± 2.50 | 2.1 | p>0.05 |
|                               | Girls  | 15.0 ± 3.33           | 19.9 ± 1.99         | 1.3     | p>0.05|
| Dynamic equilibrium, s        | Boys   | 17.2 ± 0.83           | 15.5 ± 0.55         | 1.7     | p>0.05|
|                               | Girls  | 16.9 ± 0.88           | 14.9 ± 0.49         | 1.9     | p>0.05|
| Three throws forward, s       | Boys   | 9.8 ± 0.58            | 8.1 ± 0.39          | 2.3     | p>0.05|
|                               | Girls  | 9.2 ± 0.39            | 8.2 ± 0.28          | 2.2     | p>0.05|
| Rhythmic movements of the upper and lower extremities, number | Boys | 7.9 ± 0.93 | 9.4 ± 0.81 | 1.3 | p>0.05 |
|                               | Girls  | 7.0 ± 0.82            | 8.9 ± 0.68          | 1.7     | p>0.05|

During the period of using ground gymnastics exercises in the subjects of the experimental group, although the indicators of static and dynamic equilibrium increased, but this increase, as in the control group was not probable. This can be explained by the fact that all the exercises of the proposed complex of ground gymnastics were performed in a supine and sitting position, which did not have the necessary effect on the vestibular apparatus of the subjects.

Significant improvement in the experimental group, both boys and girls gained coordination of movements (three throws forward). Thus, for boys the time of this test improved by 20%, and for girls by 23%, which indicates a positive influence of ground gymnastics on the development and improvement of this coordination ability of young athletes in acrobatic rock and roll.
Despite the fact that the indicator of the ability to rhythmic activity (rhythmic movements of the upper and lower extremities) improved significantly in both groups, the dynamics of its development did not show statistical probability.

**Discussion**

In any sport, a solid foundation for mastering the technique of exercises and further successful training and competitive activities is physical training. Therefore, we fully agree with the opinion of O. Kaluzhna (2010) on the importance and significance of this section of sports training in dance sports, which creates optimal conditions for the implementation of other sections of sports training [17].

We consider the opinion of a number of authors [1, 3, 14, 18, 19] to be correct, that the most favorable period for laying the foundations of almost all physical abilities is considered to be the younger school age. This is confirmed in the curriculum for acrobatic rock 'n' roll. The developers of this program highlight the age anatomical and physiological characteristics of children who are engaged at the initial level and the methodological features that follow from this, in particular: the formation of correct posture; careful development of flexibility and strength abilities; creating an emotional background for classes; small amount of loads [9].

After analyzing our own coaching experience and the experience of other coaches described in scientific papers [14, 16, 17, 20], we found that in the practice of dance sports training and coaching are carried out by repeating specific compositions, ie actually competitive exercises, which reduces their quality assimilation and in the future can cause posture disorders and injuries.

In addition, the results of measuring the level of development of certain physical abilities of children of primary school age, who begin to engage in acrobatic rock 'n' roll, showed their low level.

In any sport, a solid foundation for mastering the technique of exercises and further successful training and competitive activities is physical training. Therefore, we fully agree with the opinion of O. Kaluzhna (2010) on the importance and significance of this section of sports training in dance sports, which creates optimal conditions for the implementation of other sections of sports training [17].

We consider the opinion of a number of authors [1, 3, 14, 18, 19] to be correct, that the most favorable period for laying the foundations of almost all physical abilities is considered to be the younger school age. This is confirmed in the curriculum for acrobatic rock 'n' roll. The developers of this program highlight the age anatomical and physiological characteristics of children who are engaged at the initial level and the methodological features that follow from this, in particular: the formation of correct posture; careful development of flexibility and strength abilities; creating an emotional background for classes; small amount of loads [9].

After analyzing our own coaching experience and the experience of other coaches described in scientific papers [14, 16, 17, 20], we found that in the practice of dance sports training and coaching are carried out by repeating specific compositions, ie actually competitive exercises, which reduces their quality assimilation and in the future can cause posture disorders and injuries.

In addition, the results of measuring the level of development of certain physical abilities of children of primary school age, who begin to engage in acrobatic rock 'n' roll, showed their low level. Thus, a comparative analysis of the obtained indicators of novice athletes and normative assessments of physical fitness of Ukrainian primary school students [21] revealed that at the beginning of

### Table 2

| Indicators of physical fitness | Gender | Before the experiment | After the experiment | t     | p    |
|-------------------------------|--------|-----------------------|---------------------|-------|------|
| Lean forward, cm              | Boys   | 3,3 ± 0,45            | 5,6 ± 0,70          | 2,7   | p<0,05|
|                               | Girls  | 3,9 ± 0,76            | 7,1 ± 1,14          | 2,4   | p<0,05|
| Twine on the left leg, cm     | Boys   | 17,6 ± 2,11           | 11,0 ± 1,83         | 2,4   | p<0,05|
|                               | Girls  | 15,6 ± 2,09           | 9,1 ± 1,32          | 2,6   | p<0,05|
| Twine on the left leg, cm     | Boys   | 19,3 ± 1,31           | 14,6 ± 1,20         | 2,7   | p<0,05|
|                               | Girls  | 16,3 ± 1,65           | 11,9 ± 0,72         | 2,5   | p<0,05|
| Transverse twine, cm          | Boys   | 17,6 ± 3,26           | 13,0 ± 2,60         | 1,1   | p<0,05|
|                               | Girls  | 15,9 ± 2,98           | 11,4 ± 2,43         | 1,2   | p<0,05|
| Push-up, the number of times  | Boys   | 8,0 ± 1,25            | 10,3 ± 1,15         | 1,3   | p<0,05|
|                               | Girls  | 4,1 ± 1,19            | 6,0 ± 0,62          | 1,4   | p<0,05|
| Lifting the torso to the side in 1 minute (number of times) | Boys | 20,3 ± 2,26 | 27,3 ± 1,90 | 2,4 | p<0,05 |
|                               | Girls  | 17,9 ± 1,99           | 25,0 ± 1,55         | 2,8   | p<0,05|
| Lifting straight legs in height, the number of times | Boys | 17,4 ± 2,21 | 24,1 ± 1,74 | 2,4 | p<0,05 |
|                               | Girls  | 15,9 ± 2,47           | 23,6 ± 2,08         | 2,4   | p<0,05|
| Static equilibrium with open eyes, s | Boys | 13,3 ± 2,96 | 20,4 ± 2,20 | 1,9 | p<0,05 |
|                               | Girls  | 14,0 ± 2,44           | 21,6 ± 2,36         | 2,2   | p<0,05|
| Dynamic equilibrium, s        | Boys   | 16,8 ± 0,87           | 15,4 ± 0,68         | 1,3   | p<0,05|
|                               | Girls  | 16,2 ± 0,60           | 15,1 ± 0,50         | 1,4   | p<0,05|
| Three throws forward, s       | Boys   | 9,7 ± 0,46            | 8,1 ± 0,42          | 2,5   | p<0,05|
|                               | Girls  | 8,9 ± 0,30            | 7,3 ± 0,49          | 2,8   | p<0,05|
| Rhythmic movements of the upper and lower extremities, number | Boys | 7,4 ± 0,74 | 9,0 ± 0,67 | 1,6 | p<0,05 |
|                               | Girls  | 6,7 ± 0,73            | 7,9 ± 0,80          | 1,1   | p<0,05|
the study they were, at best, satisfactory on a five-point scale.

Fully supporting the authors on the high importance of physical training and its features in the initial stages of many years of training, we searched for effective means of developing flexibility, strength, coordination and other abilities. It turned out that a large number of scientists [5, 16, 22, 23, 24] suggest using choreographic exercises as a basis for learning the technique of dance exercises. The value of such exercises is undeniable, they are effective for the development of the necessary physical abilities, but the complexity and increased requirements for the musculoskeletal system do not make beginners want to perform them. It is quite different when it comes to ground floor choreography, in which exercises are performed in lying and sitting positions, which reduces the load on the musculoskeletal system of children.

 Agreeing with the statement of the authors [10, 25, 26] that children of primary school age better absorb information if it has a plot color, we suggested that young athletes, when performing floor gymnastics exercises, compare them with different stages of butterfly birth. Initially, they learned to master low-amplitude movements of the legs and arms and the body as a whole, performing abduction and reduction, as well as flexion and extension, while imitating the caterpillar. Exercises in grouping and rolling in them and overturning imitated a cocoon or "doll", and high-amplitude dynamic movements of legs and arms in all directions should remind children of butterfly wings.

The introduction of parterre choreography complexes in the educational and training process of young athletes engaged in acrobatic rock ‘n’ roll has shown the high efficiency of their use. After three months, during which the developed complexes were introduced into the training of young rock and roll players, they improved their results to an excellent level on a five-point scale of normative assessments of physical fitness of Ukrainian primary school students [21].

The results of the study also confirm the sexual characteristics of the development of certain physical abilities [13, 21]. Thus, in boys of the experimental and control groups, all indicators of flexibility were lower than in girls, and strength in boys, on the contrary, were higher. Regarding the indicators of static balance and coordination of movements, they were better in girls of both groups, both at the beginning and at the end of the experiment. And the dynamic balance and ability to rhythmic activity, according to the test of rhythmic movements of the upper and lower extremities, was better in boys of both groups.

Conclusions

1. The study and analysis of educational and methodological and special scientific literature and the survey of coaches revealed the priority physical abilities necessary for the effective training of young athletes in this sport, including flexibility, strength and coordination skills.

2. Based on the analysis of anatomical-physiological and psychological features of development of children engaged in rock ‘n’ roll at the initial stage of long-term training, floor floor gymnastics exercises are selected, aimed at developing the necessary physical abilities and introduced in initial training groups.

3. The high efficiency of the use of ground gymnastics for the development of mobility in the hip joints, the strength of the muscles of the torso and legs, and coordination of movements in primary school children engaged in acrobatic rock and roll at the elementary level has been experimentally proven.

Conflict of interest

Authors state that there is no conflict of interest.

References

1. Lutsenko LS. Optimization of the training process in acrobatic rock and roll at the stage of initial training. Cand. Diss. Kharkiv; 2005.
2. Bateieva N. Features of development of coordination abilities at athletes of acrobatic rock-n-roll at the age of 7-8 years. Slobozhansky scientific and sports bulletin. 2017;2:13-17.
3. Kamaev OI, Kyzim PN. Features of dance training of athletes of the category "children" (6-9 years) in acrobatic rock and roll at the initial stage of the first year of training. Slobozhansky scientific and sports bulletin. 2013;3:37-40.
4. Kyzim PN, Bateieva NP. Technique of biomechanical analysis of Kiku basic move in acrobatic rock and roll. Slobozhansky scientific and sports bulletin. 2017;4:53-59.
5. Lutsenko LS. Choreographic training in acrobatic rock and roll. Pedagogy, psychology and medico-biological problems of physical education and sport. 2002; 28: 67-74.
6. Bateev NP, Kyzim PN. Improving the special physical and technical training of qualified athletes in acrobatic rock and roll in the annual macrocycle, 2017, ISBN 978-617-7256-95-2.
7. Artemieva GP. Criteria for selection and prediction of sports improvement in acrobatic rock and roll. Cand. Diss. Kharkiv; 2007.
8. Mullahgildina Ala. Improving the effectiveness of the training process in acrobatic rock and roll. Cand. Diss.. Kharkiv., 1995.
9. Filimonova L. Curriculum for acrobatic rock and roll. Approved by the Ministry of education of Ukraine from 23.12.2010.
10. Humeniuk SV. Organization and conduct of training sessions in dance sports. Methodical recommendation. Kharkiv, 2012: 15.
11. Kyzim PN, Alabin VG, Makurin IU, Mullagildina Al. Acrobatic rock and roll. Benefit. Kharkov, 1999.
12. Kyzim PN. The program of studying (teaching) the basic movements of acrobatic rock and roll in grades 1-4 of secondary schools. Kharkiv, 1997.
13. Serhiienko LP. Testing of motor abilities of schoolchildren. Kyiv: Olympic Literature; 2001. ISBN 966-7133-36-2.
14. Lutsenko LS, Mullagildina Ala, Listunova SI. The main problems of the training process of young athletes in acrobatic rock and roll (according to the results of the questionnaire). Pedagogy, psychology and medico-biological problems of physical education and sport, 1999: 6:43-46.
15. Vikhreva NA. Exercise on the floor to prepare for classes in classical dance. Moscow: Teatralis; 2004, ISBN 5 - 9900078-7-0.
16. Eresko IE. Technique of improvement of training process of children 7-9 years on the basis of means of choreography. Cand. Diss. Khabarovsky; 2005.
17. Kaluzhna O. Physical training in the system of long-term training of athletes-dancers. Sport Bulletin of Pridneprovie, 2010:3:81-83.
18. Kyzim PN, Bateeva NP, Model characteristics of the General physical fitness of athletes acrobatic rock and roll category "boys" 10-14 years of different skill levels. Slobozhanyski scientific and sports bulletin, 2009:59-63.
19. Kravchuk TM, Sanzharova NM, Sliusar OO, Moisieiev AI. Comparison of the impact studies of acrobatic rock-n-roll and ballroom dancing on the creation of a culture of movement of children of primary school age. Health, sport, rehabilitation, 2018:4:72-80. http://dx.doi.org/10.34142/HSR.2018.04.04.
20. Zareva I. Comparative analysis of the somatic type of ballerinas and competitors in rhythmic gymnastics and sports dancing. Research in Kinesiology, 2016;44(1).
21. Serhiienko LP. Sports Metrology: theory and practical aspects. Textbook. Kyiv: CST; 2010. ISBN 978-966-373-581-8.
22. Todorova VG. Theoretical and methodological foundations of choreographic training in technical and aesthetic sports (on the material of sports aerobics): monograph. L:viv: LDUFC; 2018. ISBN 978-617-7336-29-6.
23. Artemieva GP, Moshenska TV. The role and importance of choreography in gymnastics and dance sports. Slobozhansky scientific and sports Bulletin, 2018;4(65):32-36.doi: 10.15391/snv.2018.4.005
24. Sosina VYu. Choreography in gymnastics: studies. benefit. Kyiv: Olympic Literature; 2009.
25. Kravchuk TM, Sanzharova NM, Golenkova YV, Riadymska IA. The use of means of rhythm gymnastics in the process of physical education of children of primary school age. Health, sport, rehabilitation, 2015;1:51-53.
26. Khudolii O. M., Ivashchenko, O. V., Iermakov, S. S., & Rumba, O. G. (). Computer simulation of junior gymnasts’ training process. Science of Gymnastics Journal, 2016;8(3): 215-228.

Information about the authors

Kravchuk T.M.
tatyana1409@gmail.com
https://orcid.org/0000-0002-6370-4000
H.S. Skovoroda Kharkiv National Pedagogical University
Alchevskikh street, 29, Kharkiv, 61002, Ukraine

Sanzharova N. M.
ninasanzarova@gmail.com
https://orcid.org/0000-0003-0916-4100
H.S. Skovoroda Kharkiv National Pedagogical University
Alchevskikh street, 29, Kharkiv, 61002, Ukraine

Golenkova Ju.V.
golenkovaulia@gmail.com
https://orcid.org/0000-0003-1553-8893
H.S. Skovoroda Kharkiv National Pedagogical University
Alchevskikh street, 29, Kharkiv, 61002, Ukraine

Katretchko I.B.
1986kib@gmail.com
H.S. Skovoroda Kharkiv National Pedagogical University
Alchevskikh street, 29, Kharkiv, 61002, Ukraine

Received: 16.06.2020

Information про авторів

Кравчук Т.М.
tatyana1409@gmail.com
https://orcid.org/0000-0002-6370-4000
Харківський національний педагогічний університет імені Г.С. Сковороди
вулиця Алчевська, 29, м. Харків, 61002, Україна

Санжарова Н.М.
ninasanzarova@gmail.com
https://orcid.org/0000-0003-0916-4100
Харківський національний педагогічний університет імені Г.С. Сковороди
вулиця Алчевська, 29, м. Харків, 61002, Україна

Голенкова Ю.В.
golenkovaulia@gmail.com
https://orcid.org/0000-0003-1553-8893
Харківський національний педагогічний університет імені Г.С. Сковороди
вулиця Алчевська, 29, м. Харків, 61002, Україна

Катречко І.Б.
1986kib@gmail.com
Харківський національний педагогічний університет імені Г.С. Сковороди
вулиця Алчевська, 29, м. Харків, 61002, Україна

Принята в редакцію: 16.06.2020