

Improvement of special physical readiness of the Juvenal category athletes from acrobatic rock'n'roll using functional training tools

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Purpose: to develop and experimentally substantiate the method of improving the special physical readiness of the athletes of the Juvenal category with acrobatic rock'n'roll using the means of functional training.

Material & Methods: theoretical analysis and generalization of data from special scientific and methodological literature, pedagogical observation, pedagogical testing, pedagogical experiment, methods of mathematical statistics. The survey involved 40 athletes (20 sports pairs of the Juvenal category).

Results: the use of the means of functional training of the experimental technique has improved the level of special physical readiness of athletes.

Conclusion: the positive effect of the means of functional training in the components of speed, power and speed-strength training on the dynamics of the level of special physical readiness of athletes from acrobatic rock'n'roll.

Keywords: acrobatic rock'n'roll, special physical readiness, functional training.

Introduction

Modern trends in the development of acrobatic rock'n'roll as a complex co-ordinated sport are characterized by an increased number of varieties of choreographic movements in the direction of style, increased intensity of basic exercises, acrobatic elements, structure and content of competitive programs in accordance with the requirements of the Regulations of the World Rock and Roll Confederation (WRRC, 2016) [7; 11].

Scientists (G.P. Artemyeva, N.P. Bateeva, P.N. Kizim, L.S. Lutsenko, A. Ya. Mullagildina, V.S. Terekhov) noted that the most important importance in training athletes for acrobatic rock'n'roll has a level of development of high-speed, power and speed-strength abilities, morphological parameters, biomechanical performance of the machinery, efforts that affect the performance of the basic movement and acrobatic elements (figures), both during contact execution and unsupported movement.

The research of special motor fitness and physical qualities of rock'n'roll athletes was conducted by L.S. Lutsenko, A.Ya. Mullagildina. The features of morphological parameters were investigated by G.P. Artemyeva. The biomechanical characteristics of the technique for performing the basic main course were investigated by P.N. Kizim and V.S. Terekhov. Biomechanical indicators of the technique of performing acrobatic elements (figures) in the unsupported movement of a partner of a sports pair were explored by N.P. Bateeva.

The same time, the influence of indicators of the level of speed, speed-strength and strength and power qualities, as well as the level of general and special endurance on the special physical preparedness of the rock'n'roll athletes category Juvenal remains unclear, which is extremely important for in-

creasing the efficiency of their training [10; 13; 15].

Performing basic rock'n'roll dance movements and acrobatic figures requires the manifestation of individual motor qualities, both during the training process and in competitive activities. It is important to determine which motor quality after loading is more affected by the technique of performing basic rock and roll dance movements and acrobatic figures. This will allow to develop a combination of different motor qualities and perfection of the elements of the technique of basic rock'n'roll movements, acrobatic figures and correction of the training process [8; 12; 14; 16].

The analysis of special scientific and methodological literature showed the problems of the level of special physical fitness of athletes of acrobatic rock and roll at the stage of preliminary basic training, is the relevance of this study.

Relationship of research with scientific programs, plans, themes. The work is carried out in accordance with the Consolidated Plan of research work in the field of physical culture and sports for 2016–2020. On the topic: "Psycho-sensory regulation of the motor activity of athletes of situational sports" (No. 0116U008943).

Purpose: to develop and experimentally substantiate the method of improving the special physical readiness of the athletes of the Juvenal category with acrobatic rock'n'roll using the means of functional training.

Material and Methods of the research

Methods of research-theoretical analysis and generalization of scientific and methodical literature; pedagogical observations; special pedagogical testing; pedagogical experiment;

medical and biological research; methods of mathematical statistics.

To identify the dynamics indicators characterizing the special physical preparedness of rock'n'roll athletes during the annual macrocycle at the beginning of the pedagogical experiment and at the end of it we tested the level of speed, speed-strength and strength qualities, as well as the level of general and special endurance of those whose involved.

Athletes from the Juvenile category from the acrobatic rock'n'roll control and experimental groups were engaged in the traditional curriculum, where: 25% and 43,7% of total time were allocated to the general physical training and special physical training respectively, 31,3% were allocated to technical training.

In the course of the pedagogical experiment using the traditional method, the time allocated for physical training in the control group was distributed as follows: 17% of the total time was allocated for strength training, 33% for speed-strength training, 45% for the development of general and special endurance, and coordination abilities 5%.

The time allotted for physical training in the experimental group on the basis of the experimental methodology was distributed as follows: 27% of the total time was allocated for strength training, 46% for speed-strength training, 20% for general and special endurance development, to improve flexibility and coordination abilities 7%.

Athletes of the Juvenile category from the acrobatic rock'n'roll of the control and experimental groups were trained under the same conditions with the same program. The difference was only in the different distribution of physical training. The main difference between the experimental method and the traditional method was the use of functional training at the end of the main part of the class (Figure 1).

The training of the Juvenile athletes from the acrobatic rock'n'roll of the experimental group was aimed at improving the strength and speed-strength qualities with the use of the functional training of the experimental technique.

Physical training of the Juvenile category athletes from the acrobatic rock'n'roll of the control group was aimed at increas-

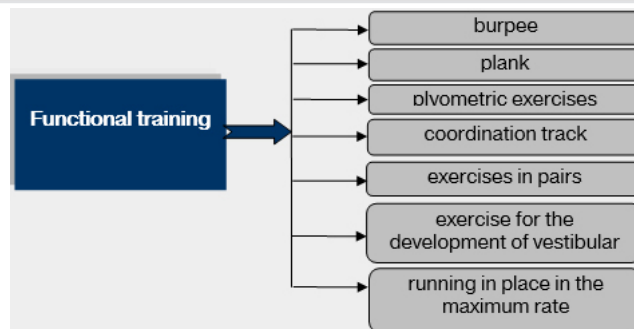


Figure 1. Means of functional training of the experimental methodology for improving the special physical preparedness of athletes of the category Juvenile from acrobatic rock'n'roll

ing the level of development of general and special endurance according to the traditional method of the training process.

Results of the research

At the beginning of the pedagogical experiment, athletes, both in the experimental and in the control groups, were relatively equal in terms of physical preparedness (Table 1, 2) [9].

By the coefficients of variation in the male partners of the sports pair of the experimental group, the uniformity of the indices in eight tests of physical preparedness is traced (bending and extension of the arms in the rest lying on the floor, raising the legs in the vise on the gymnastic wall, standing long jump, running speed on the place, lifting the trunk from the supine position, tilt forward from sitting position, VC) from $V = 5,5\%$ to $V = 15,9\%$. In two tests, the indicators were of an average degree of uniformity (dynamometry: right hand $V = 25,0\%$, left hand $V = 28,5\%$).

By the coefficients of variation in the female partners of the sports pair of the experimental group, the uniformity of the indices in seven tests of physical preparedness is traced bending and extension of the arms in the rest lying on the floor, raising the legs in the vise on the gymnastic wall, running speed on the place, lifting the trunk from the supine position, tilt forward from sitting position, VC) from $V = 3,9\%$ to $V = 15,4\%$. In three tests, the indicators were of an average degree of uniformity (standing long jump $V = 16,3\%$; dynamometry: right

Table 1
Indicators of fitness level of sports couples (male partner+female partner) of the category Juvenile from acrobatic rock'n'roll (EG, n=20)

| No. i/o | Test | Male partner indicators | | | | Female partner indicators | | | |
|---------|---|-------------------------|----------|------|------|---------------------------|----------|------|------|
| | | \bar{X} | σ | m | V, % | \bar{X} | σ | m | V, % |
| 1. | Flexion and extension of hands in the rest lying on the floor (number of times) | 23,8 | 3,79 | 1,26 | 15,9 | 15,5 | 1,72 | 0,6 | 3,9 |
| 2. | Lifting the legs in the vise on the gymnastic wall (number of times) | 27,1 | 3,98 | 1,33 | 14,6 | 23,5 | 3,44 | 1,1 | 14,6 |
| 3. | Jump upwards (cm) | 31,8 | 4,42 | 1,47 | 13,9 | 31,42 | 5,11 | 1,7 | 16,3 |
| 4. | Running speed on the place for 10 s. (Number of steps) | 28,1 | 2,69 | 0,9 | 9,6 | 26,2 | 3,12 | 1,04 | 11,9 |
| 5. | Standing long jump (cm) | 172,4 | 9,59 | 3,2 | 5,5 | 155,8 | 5,12 | 1,7 | 3,3 |
| 6. | Lifting the trunk from the supine position for 60 s (times) | 41,4 | 4,5 | 1,5 | 10,8 | 37,8 | 2,53 | 0,84 | 6,7 |
| 7. | Tilt forward from sitting position (cm) | 10,8 | 1,69 | 0,6 | 15,6 | 14,7 | 2,26 | 0,8 | 15,4 |
| 8. | Dynamometry: right hand (kg) | 21,6 | 5,4 | 1,8 | 25,0 | 17,8 | 4,16 | 1,4 | 23,4 |
| 9. | Dynamometry: left hand (kg) | 21,4 | 6,11 | 2,03 | 28,5 | 16,8 | 3,16 | 1,05 | 18,8 |
| 10. | VC | 26,1 | 3,54 | 1,18 | 13,5 | 23,3 | 2,71 | 0,9 | 11,6 |

hand V – 23,4%; left hand V – 18,8%).

By the variation coefficients of the male partner sports pair of the control group, the uniformity of the indices is observed in the five physical preparedness tests (lifting the legs in the vise on the gymnastic wall, jump up, running speed in place, jumping in length, lifting the trunk from the lying position) from V – 5,5% to V – 15,3%. In two tests, the indices were of an average degree of homogeneity (flexion and extension of the arms in the rest lying on the floor, V – 17,6%, inclination forward from the sitting position V – 19,2%). In three tests (dynamometry: right hand V – 48,2%, left hand V – 43,9%, VC V – 31,1%), the group was not homogeneous.

By the coefficients of variation in the female partners of the sports couple of the control group, the uniformity of the indices in seven physical preparedness tests is observed (lifting the legs in the vise on the gym wall, leaping up, running speed in place, leaping in length, lifting the trunk from the prone position, tilting forward from the sitting position; VC) from V – 4,4% to V – 13,9% in three tests the indices were of medium degree of homogeneity (flexion and extension of the arms in the rest lying on the floor, V – 16,4%; dynamometry: right hand V – 21 8 %, left hand V – 25,0%).

The average group indicators of physical fitness testing of athletes EG and CG show a minimal difference in the results. The greatest difference in the result among partners is observed in the average indicators of the test "Dynamometry: right hand, kg" (4 kg, 15,6%). The slightest difference in their results is observed in the average test scores: "Flexion and extension of the arms in the rest lying on the floor, kil-in time" (0,1 times, 0,4%); "Lifting the legs in the vise on the gymnastic wall (keel-at times)" (0,1 times, 0,4%).

The greatest difference in the result among female partners is observed in the average indicators of the test "Dynamometry: left hand, kg" (4,4 kg, 26,2%). The slightest difference in their results is in the average test scores: "Jump up (cm)" (0,12 cm, 0,4%).

To monitor the dynamics of the level of special physical fitness of the Juvenaly category from acrobatic rock'n'roll in the process of the pedagogical experiment, testing of various components of special physical preparedness was used: speed, strength, strength and level of endurance development. To determine the nature of the impact of training aimed

at developing the special qualities of Juvenaly athletes from acrobatic rock'n'roll, were tested indicators. Tests: T1, T2, T5 – used to determine the level of development of speed-strength components; test T6 was used to determine the level of development of power components; To determine the level of development of special endurance, we used tests: T3, T4, T7 (Table 3). The degree of influence of the means of functional training of the experimental methodology aimed at developing the special qualities of the athletes of the Juvenal category from acrobatic rock'n'roll EG is shown in Table 3.

Testing Juvenal category athletes from the acrobatic rock'n'roll at the end of the experiment revealed that the special physical readiness indicators significantly increased in the experimental group under the influence of the functional training experimental procedure. Thus, in the EG, the indices of the special physical preparedness of the male partners of a sports couple from acrobatic rock'n'roll after the pedagogical experiment in the first test "2 somersaults forward, 1 somersault back, "tour" for 30 seconds" tour "for 30 s (number of times)" amounted to 5,47, which exaggerated the average result by 0,9 times (t=6,05, p<0,05). The average performance of the test "Performing the main move in 20 s (number of times)" improved by 0,67 times (t=6,9; p<0,05).

Indicators of special physical preparedness of female partners of a sports couple with acrobatic rock'n'roll after the pedagogical experiment in the performance of the first test "2 somersaults forward, 1 somersault back, "tour" for 30 seconds" tour "for 30 s (number of times)" was 5,72, which exaggerated the average result is 1,2 times (t=5,14, p<0,05). The average result of the test "Performing the main move in 20 s (number of times)" improved from 11,44 to 11,67 (t=3,02; p<0,05).

The indicators of the special physical preparedness of the sports couple (male partner+female partner) from acrobatic rock'n'roll after the pedagogical experience in the performance of the test "Lower change with the rotation of the partner at 540° (number of times)" on average increased by 1,1 times (t=3,45, p<0,05). The average performance of the test "Top change with the turn of the partner at 720° in American spin (number of times)" improved by 1,1 times (t=3,6, p<0,05). The average performance of the test "Lower, upper change, tour anler (in the air) for 360° (number of times)" improved by 0,6 times (t=3,04; p<0,05). The average performance of the test "Lower, upper change, the partner jump up

Table 2
Indicators of fitness level of sports couples (male partner+female partner) of the category Juvenal from acrobatic rock'n'roll (CG, n=20)

| No. i/o | Test | Male partner indicators | | | | Female partner indicators | | | |
|---------|---|-------------------------|----------|------|------|---------------------------|----------|------|------|
| | | \bar{X} | σ | m | V, % | \bar{X} | σ | m | V, % |
| 1. | Flexion and extension of hands in the rest lying on the floor (number of times) | 23,9 | 4,2 | 1,4 | 17,6 | 15,2 | 2,49 | 0,8 | 16,4 |
| 2. | Lifting the legs in the vise on the gymnastic wall (number of times) | 27,0 | 2,83 | 0,94 | 10,5 | 24,4 | 3,17 | 1,47 | 13,9 |
| 3. | Jump upwards (cm) | 32,2 | 4,92 | 1,64 | 15,3 | 31,3 | 4,2 | 1,4 | 13,4 |
| 4. | Running speed on the place for 10 s. (Number of steps) | 28,5 | 2,84 | 0,94 | 0,9 | 26,8 | 3,18 | 1,06 | 11,8 |
| 5. | Standing long jump (cm) | 168,9 | 9,3 | 3,1 | 5,5 | 156 | 6,9 | 2,9 | 4,4 |
| 6. | Lifting the trunk from the supine position for 60 s (times) | 40,7 | 3,2 | 1,06 | 7,8 | 36,5 | 3,63 | 1,2 | 9,9 |
| 7. | Tilt forward from sitting position (cm) | 11,1 | 2,13 | 0,8 | 19,2 | 15,7 | 2,16 | 0,9 | 13,7 |
| 8. | Dynamometry: right hand (kg) | 25,6 | 12,5 | 4,2 | 48,2 | 14,2 | 3,05 | 1,01 | 21,8 |
| 9. | Dynamometry: left hand (kg) | 24,0 | 10,54 | 3,5 | 43,9 | 12,4 | 3,1 | 1,03 | 25,0 |
| 10. | VC | 30,5 | 9,5 | 3,16 | 31,1 | 20,5 | 2,6 | 0,9 | 12,6 |

Table 3

Dynamics of changes in the indices of special physical readiness of the Juvenal category athletes from acrobatic rock'n'rol (EG; n=20; p=0,05)

| Test SPP | | $\bar{X} \pm m$ | | t | p |
|---|--|-------------------|------------------|------|-------|
| | | Before experiment | After experiment | | |
| Male partner (n=10) | | | | | |
| T 1 | 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times) | 4,57±0,14 | 5,47±0,05 | 6,05 | <0,05 |
| T 2 | Performing the main move in 20 seconds (number of times) | 10,74±0,04 | 11,41±0,09 | 6,9 | <0,05 |
| Female partner (n=10) | | | | | |
| T 1 | 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times) | 4,52±0,17 | 5,72±0,16 | 5,14 | <0,05 |
| T 2 | Performing the main move in 20 seconds (number of times) | 11,44±0,07 | 11,67±0,03 | 3,02 | <0,05 |
| General (joint) execution in a pair (n=20) | | | | | |
| T 3 | Lower change with the rotation of the partner at 540° (number of times) | 5,3±0,27 | 6,4±0,17 | 3,45 | <0,05 |
| T 4 | Top change with the turn of the partner at 720° in American spin (number of times) | 4,2±0,26 | 5,3±0,16 | 3,6 | <0,05 |
| T 5 | Lower, upper change, tour anler (in the air) for 360° (number of times) | 4,5±0,17 | 5,1±0,1 | 3,04 | <0,05 |
| T 6 | Lower, upper change, the partner jump up with the support of the partner's hands (number of times) | 6,4±0,17 | 7,2±0,14 | 3,63 | <0,05 |
| T 7 | Performing competitive program in nonstop (number of times) | 1,38±0,04 | 1,79±0,05 | 6,4 | <0,05 |

with the support of the partner's hands (number of times)" improved by 0,8 times (t=3,63, p<0,05). In the performance of the test "Performing competitive program in nonstop (number of times)" the average indicators after the pedagogical experiment exceeded the initial indicators of the pedagogical experiment by 0,41 times (t=6,4; p<0,05).

The degree of influence of the training aimed at developing the special qualities of the athletes of the Juvenale category from acrobatic rock'n'roll CG is shown in Table 4.

In the CG, the indicators of the special physical preparedness of the male partners of a sports couple from acrobatic rock'n'roll after the pedagogical experiment in the first test "2 somersaults forward, 1 somersault back, "tour" for 30 seconds" tour "for 30 s (number of times)" was 4,9, which exaggerated the average result by 0,05 times (t=0,1, p<0,05). The average performance of the test "Performing the main move in 20 s (number of times)" improved by 0,06 times (t=1,34; p>0,05).

The indicators of the special physical preparedness of the female partners of a sports couple from acrobatic rock'n'roll after the pedagogical experiment in the performance of the first test "2 somersaults forward, 1 somersault back, "tour" for 30 seconds" tour "for 30 s (number of times)" was 4,9, which exaggerated the average result is 0,08 times (t=0,43, p>0,05). The average result of the test "Performing the main move in 20 s (number of times)" improved from 11,4 to 11,46 (t=0,56; p<0,05).

The indicators of the special physical preparedness of the sports couple (male partner+female partner) from the acrobatic rock'n'roll CG after the pedagogical experiment in the performance of the test "Lower change with the rotation of the partner at 540° (number of times)" increased by an average of 0,2 times (t=0,86, p>0,05). The average performance of the test "Top change with the turn of the partner at 720° in American spin (number of times)" improved by 0,2 times (t=0,9; p>0,05). The average performance of the test "Lower, upper change, tour anler (in the air) for 360° (number of times)" improved by 0,3 times (t=1,1, p<0,05). The average perfor-

mance of the test Lower, upper change, the partner jump up with the support of the partner's hands (number of times)" improved by 0,2 times (t=0,9; p<0,05). In the performance of the test "Performing competitive program in nonstop (number of times)" the average figures after the pedagogical experiment were at least 0,33 times the initial parameters of the pedagogical experiment (t=0,6; p>0,05).

The total positive changes in the indices of the special physical readiness of the athletes of the EG were: the partners exceeded the initial indicators of the pedagogical experiment by 8,8%; partners exceeded the initial indicators of the pedagogical experiment by 8,3%; general (joint) performance of tests in a pair exceeded the initial parameters of the pedagogical experiment on 15,4%.

The total positive changes in the indices of the special physical preparedness of the CG athletes were: the male partners exceeded the initial indices of the pedagogical experiment by 0,6%; female partners exceeded the initial indicators of the pedagogical experiment by 0,8%; general (joint) performance of tests in a pair exceeded the initial parameters of the pedagogical experiment on 4,2%.

Conclusions / Discussion

This study complements the methodology for improving the special physical preparedness of athletes, as described in the authors' works [2; 3; 5]. At the same time, in our study for the first time the obtained indices of the level of special physical preparedness of rock'n'roll athletes due to the use of the means of functional training of the experimental methodology in the training process. The use of functional training tools in the training process during the one-year macrocycle fully confirms our vision of solving the problem of improving the special physical preparedness of the Juvenale category in acrobatic rock'n'roll .

The technique of improving the special physical preparedness is developed on the basis of the use of functional training tools.

Table 4

Dynamics of changes in the indices of special physical readiness of the Juvenal category athletes from acrobatic rock'n'rol (EG; n=20; p=0,05)

| Test SPP | | $\bar{X} \pm m$ | | t | p |
|---|--|-------------------|------------------|------|-------|
| | | Before experiment | After experiment | | |
| Male partner (n=10) | | | | | |
| T 1 | 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times) | 4,85±0,1 | 4,9±0,8 | 0,1 | >0,05 |
| T 2 | Performing the main move in 20 seconds (number of times) | 10,75±0,04 | 10,81±0,02 | 1,34 | >0,05 |
| Female partner (n=10) | | | | | |
| T 1 | 2 somersaults forward, 1 somersault back, "tour" for 30 seconds (number of times) | 4,82±0,15 | 4,9±0,11 | 0,43 | >0,05 |
| T 2 | Performing the main move in 20 seconds (number of times) | 11,4±0,08 | 11,46±0,07 | 0,56 | >0,05 |
| General (joint) execution in a pair (n=20) | | | | | |
| T 3 | Lower change with the rotation of the partner at 540° (number of times) | 5,3±0,16 | 5,5±0,17 | 0,86 | >0,05 |
| T 4 | Top change with the turn of the partner at 720° in American spin (number of times) | 4,2±0,14 | 4,4±0,17 | 0,9 | >0,05 |
| T 5 | Lower, upper change, tour anler (in the air) for 360° (number of times) | 4,5±0,17 | 4,8±0,21 | 1,1 | >0,05 |
| T 6 | Lower, upper change, the partner jump up with the support of the partner's hands (number of times) | 6,6±0,17 | 6,8±0,14 | 0,9 | >0,05 |
| T 7 | Performing competitive program in nonstop (number of times) | 1,4±0,04 | 1,43±0,03 | 0,6 | >0,05 |

It is established that the determining factor in raising the level of special physical preparedness is the use of a set of exercises of functional training at the end of the main part of the training process and their impact on the development of speed, strength and speed-strength qualities of rock'n'roll athletes. The minimal increase in the test scores of the Juvenal athletes in acrobatic rock'n'roll was revealed after the load in the components of special endurance in the training process increased.

The application of the developed technique allows to optimize the training process of the Juvenal category athletes from acrobatic rock and roll, to increase the efficiency of their competitive programs.

Prospects for further research should be in the search for ways to solve the problem of correcting the training process of the athletes of the Juvenal category in acrobatic rock'n'roll.

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