

# Study of the level of physical fitness of young acrobat athletes at the initial stage of training

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**Purpose:** determine the level of physical preparedness of young acrobat athletes of the first year of training.

**Material & Methods:** the study was conducted on the basis of the Integrated Children's Sports School No. 6 of the Sloboda district (Kharkiv). The study involved 16 children 5–6 years old, engaged in sports acrobatics in sports and fitness groups. Enrollment in primary training groups was carried out in accordance with the regulations established by the administration of the children's sports school. Pedagogical testing of physical and functional-motor readiness of children was carried out using tests provided by the State standard of sports training in sports acrobatics to assess general and special physical preparedness. The level of speed strength, special flexibility in the hip joint and spinal column, dynamic strength, speed, static strength were determined.

**Results:** using correlation analysis, it was established that there are interconnections of a predominantly average level between the indicators of general and special physical preparedness of young athletes.

**Conclusions:** studies have established that young beginner acrobats have a high level of flexibility, other indicators of physical qualities have heterogeneous results, mainly of an average level of correlation between exercises of general and special physical fitness.

**Keywords:** acrobatics, physical qualities, training, young athletes.

## Introduction

Acrobatics is a highly coordinated sport that requires the manifestation of motor qualities in a limited time. Along with this, acrobatics is characterized not only by the complexity of the execution of elements, but also by the development of the dance, theater and choreographic direction [3; 5]. You can also observe the progress in the originality and complexity of the compositions. In connection with the rapid development of acrobatics, new teaching methods, new elements requiring new teaching methods for performing exercises appear [7; 8].

In many modern publications, scientists emphasize the need to modernize the existing training system in acrobatics. This need is primarily due to the fact that traditional organizational approaches to the process of training athletes are not focused on the features of activity, and thus do not allow maximally effectively developing the balance and coordination abilities of athletes while improving their health [1; 6].

The problem of improving the physical and technical preparedness of acrobats is due to mistakes made by athletes in the process of training sessions and competitive activities [8]

Given the characteristics of competitive activity, in-depth specialization in sports acrobatics begins at preschool age, and athletes demonstrate high achievements already at the age of 12–15 years. Thus, at the initial training stage, athletes need to create a wide range of motor skills, various special basic and special movements, create a foundation of physical fitness for mastering complex motor skills in the next stage [2; 10].

The lack of a planned system in physical and technical training in acrobatics, in particular, at the initial stage of preparation, can lead to a chaotic formation of motor skills. In this regard, there is a need to develop a scientifically based plan of educational exercises in sports acrobatics at the initial stage of preparation. It should be noted that for load planning it is necessary to focus on the level of physical fitness of young athletes. Therefore, the urgent is the problem of determining the level of development of physical qualities of children 5–6 years old, engaged in sports acrobatics for further mastering the elements of acrobatics technique.

**Purpose of the study:** to determine the level of physical preparedness of young acrobat athletes of the first year of training.

*Objectives of the study:*

1. Identify test exercises and establish the level of general and special physical preparedness of athletes involved in acrobatics.
2. To establish the existing relationships between the indicators of general and special physical preparedness of young acrobat athletes.

## Material and Methods of the research

The study was conducted on the basis of the Integrated Children's Sports School No. 6 of the Sloboda district (Kharkiv). The study involved 16 children 5–6 years old, engaged in sports acrobatics in sports and fitness groups. Enrollment in primary training groups was carried out in accordance with the regulations established by the administration of the children's

**Table 1**

**Results of testing the general preparedness of young acrobat athletes 5–6 years old (n=16)**

Name of the test	$\bar{X} \pm m$	$\sigma$	V, %	Test level by program
Bending and unbending arms of the arms in the supine position, number of times	3,44±0,18	0,73	21,16	5 – 5 4 – 4 3 – 3
In the back with the back to the gymnastic wall, the content of the angle is flexion and extension of the legs, number of times	3,94±0,19	0,77	19,60	5 – 5 4 – 4 3 – 3
Standing long jump from a place, cm	107,50±6,06	24,24	22,55	150–140 – 5 140–135 – 4 135–130 – 3
Running 30 m from the stop crouching (15 m – in one direction, 15 m – in the opposite), s	11,03±0,07	0,28	2,58	10,5–10,8 – 5 10,6–11,0 – 4 10,7–11,2 – 3
A crab position from a prone position, number of times	3,75±0,23	0,93	24,83	1. Hands upright to the floor, legs straightened – 5 2. Arms or bent legs slightly deflected – 4 3. Arms bent, legs bent – 3
Sitting on the floor with feet together, bending forward, points	3,86±0,23	0,86	22,41	1. Breastfeed – 5 2. Touch toe head – 4 3. Head touches with elastic movement – 3

sports school. Pedagogical testing of physical and functional-motor readiness of children was carried out using tests provided by the State standard of sports training in sports acrobatics to assess general and special physical fitness. The level of speed strength, special flexibility in the hip joint and spinal column, dynamic strength, speed, static strength were determined.

### Results of the research

At the beginning of September 2019, testing was carried out on the general and special physical fitness of young athletes 5–6 years old, engaged in sports acrobatics in sports and fitness groups (Tables 1, 2). To analyze the test results used methods of mathematical statistics. The arithmetic mean value ( $\bar{X}$ ), standard error of the mean value ( $m$ ), standard deviation ( $\sigma$ ), coefficient of variation ( $V$ ) were calculated. To identify the presence and nature of the relationship between the studied characters used correlation analysis.

the test results showed that the group of tested children is heterogeneous in most tests ( $V > 20\%$ ), namely: bending and unbending arms in a lying position (21,16%), long jump from a place (22,55%), crab position from a prone position (24,83%), sitting on the floor of the legs together, leaning forward (22,41%), jumping rope on 2 legs (42,32%), static balance according to the Bondarevsky method (64,8%), the balance of the "swallow" (141,72%). The above indicates that children in this group have significant differences in the level

of development of physical qualities, therefore there is a need to form subgroups according to uniform results. This approach will create conditions for a more rational distribution of loads in the classroom, adequate to the level of preparedness of children. A prerequisite for this is the pedagogical testing of children according to the proposed tests at the beginning of the training cycle and comparing its results with the data of current and stage control.

Evaluation of the results using software standards has allowed us to establish that in terms of the development of general physical qualities, most children in this group have a satisfactory level – from 31,3 to 87,5%. An average level is from 12,5 to 43,8% of children, a high level is from 12,5 to 31,3% of children according to different motor tests (Figure 1). Pedagogical testing revealed that in this group of children there is a high level of development of flexibility, in particular, of the spinal column. In our opinion, this is due to the specifics of performing acrobatic exercises and a large number of exercises to develop flexibility in the training process.

Conducting a correlation analysis made it possible to establish the presence and nature of the relationship between the results of various tests (Table 3).

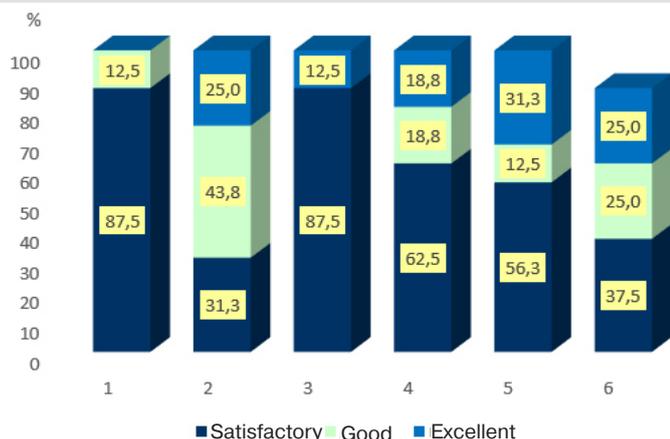
So, the average relationship between the indicators is revealed:

– speed-strength qualities with coordination abilities accord-

**Table 2**

**Results of testing the special preparedness of young acrobats athletes 5–6 years old (n=16)**

Name of the test	$\bar{X} \pm m$	$\sigma$	V, %
Shuttle run 3x10 m with running around stuffed balls, s	15,45±0,27	1,10	7,09
Lifting the body from a prone position for 60 s, number of time	29,06±1,11	4,45	15,31
30 m running, s	11,07±0,15	0,62	5,57
Jumping rope on 2 legs, number of times	14,69±1,55	6,22	42,32
Static equilibrium according to the Bondarevsky method, s	64,44±10,44	41,76	64,80
Romberg test complicated, s	4,63±0,13	0,50	10,81
Balance "swallow", s	5,46±1,93	7,73	141,72



**Fig. 1. Assessment of the results of testing the general physical fitness of acrobats athletes 5–6 years old according to control standards:**

1 – bending and unbending arms of the arms in the supine position, number of times; 2 – in the back with the back to the gymnastic wall, the content of the angle is flexion and extension of the legs, number of times; 3 – standing long jump from a place, cm; 4 – Running 30 m from the stop crouching (15 m - in one direction, 15 m - in the opposite), s; 5 – crab position from a prone position, number of times; 6 – Sitting on the floor with feet together, bending forward, points.

ing to tests, shuttle run ( $r=-0,66$ ) and Romberg test ( $r=0,63$ );  
 – flexibility according to the test "Crab position from a prone position" and static equilibrium according to the Bondarevsky method ( $r=0,60$ ), Romberg breakdown ( $r=0,46$ )  
 – flexibility according to the test "Sitting on the floor legs together, leaning forward" and static equilibrium according to the Bondarevsky method ( $r=-0,54$ );  
 – abdominal muscle strength with the exercise of lifting the torso from a supine position for 60 s ( $r=0,55$ ) and with static equilibrium according to the Bondarevsky method ( $r=-0,41$ ) and Romberg test ( $r=0,46$ ).

Studying the relationship between the indicators of general and special physical preparedness of young acrobats makes it possible to take into account the use of appropriate physical exercises for the development of general and special physical qualities.

## Conclusions / Discussion

The level of development of modern acrobatics is characterized by exceptionally high sports achievements, a significant increase in competition among athletes, necessitates the search for new ways to improve training, especially for beginners, when physical and technical preparedness is formed.

When mastering certain elements of technology, a certain level of physical qualities is necessary, without which it is impossible to perform them or there is a threat of mastering movements with significant errors, in the future it will negatively affect their structural quality. Today, there are studies (S. S. Koval, 2010; T. I. Kharchenko) [11] about the features of the integrated development of motor qualities and the assimilation of elements of technology in young athletes at the initial training stage in figure skating and football, which gave a positive effect.

Using correlation analysis, the presence of interconnections of a predominantly average level between the indicators of general and special physical preparedness of young athletes was established. This indicates a significant interdependence of the manifestation of physical qualities in the preparation of young acrobats.

A study of the general and special physical preparedness of young athletes revealed a high level of development of flex-

**Table 3**  
**Quantitative indicators of the relationship between the results of testing the general and special physical preparedness of young acrobat athletes 5–6 years old (n=16)**

Name of the test	Shuttle run 3x10 m with running around stuffed balls,	Lifting the body from a prone position for 60 s	30 m running	Jumping rope on 2 legs	Static equilibrium according to the Bondarevsky method	Romberg test complicated	Balance "swallow"
Bending and unbending arms of the arms in the supine position, number of times	0,28	-0,34	0,20	0,22	-0,33	0,27	-0,26
In the back with the back to the gymnastic wall, the content of the angle is flexion and extension of the legs, number of times	-0,21	0,55	0,29	0,28	-0,41	0,46	0,04
Standing long jump from a place, cm	-0,66*	0,33	-0,08	-0,51	-0,10	0,63*	0,35
Running 30 m from the stop crouching (15 m – in one direction, 15 m – in the opposite), s	0,50	-0,32	-0,58	-0,46	0,49	-0,16	-0,08
A crab position from a prone position, number of times	0,00	0,26	0,22	0,28	-0,60*	0,46	0,09
Sitting on the floor with feet together, bending forward, points	-0,17	0,54	0,39	0,24	-0,54*	0,37	0,39

**Remark.** \* – reliability of the correlation coefficient  $p<0,05$ .

ibility in this group. It was established that in terms of the level of development of strength, speed and strength qualities, speed and balance, this group is heterogeneous ( $V > 20\%$ ), therefore, when planning the training process, it is advisable to divide the children into subgroups in accordance with their level of preparedness.

Given that acrobatics is a complex-coordinated sport that has its own characteristics, both in the structure of movements

and in the level and significance of physical qualities, the definition of motor qualities and their level of development for the further assimilation of the basic elements of technology is an actual scientific research.

**Prospects for further research** include the determination of motor qualities to perform basic elements by young acrobats at the initial training stage.

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