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Features of motor skills display by young gymnasts at the stage of initial training

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Abstract

Purpose: The purpose of this study is to show the dynamics of development of speed and power capabilities of preschool and young children.

Methods: 1. Pedagogical observations; 2. Questionnaires; 3. Electrical registration of time parameters; 4. Pedagogical experiment; 5. Mathematical and statistical analysis.

Results: During the experiment, a close relationship was revealed between the flight time indicator and the results of a jump up from a place: at the age of 5, with the result of a jump up from a place with a wave of the hands $r=0.763$, and at the age of 6 and 7, with the results of a jump up from a place without a wave of the hands ($r=0.542$ and 0.666 , respectively).

Conclusion: A slowdown in the growth rate of SPT (special physical training) results in 6-and 7-year-old gymnasts compared to 5-year-olds was found, especially in strength exercises, which indicates the need for scientific verification of the question of how this process is related to the course of the first growth jump during this period and what should be the correction of the methods and means used by young gymnasts at the initial stage.

Keywords: Competitive activity, complex control, special physical training, technical fitness, speed and power capabilities.

Introduction

Gymnastics is one of the most popular types of Olympic program, which for more than a century unites representatives of almost all continents of the world in an International Federation. The desire of many countries to develop this sport is largely explained not so much by promising competition with leading national teams, but rather by social motives for joining the international gymnastics movement. Currently, gymnastics has reached a new stage of increasing the complexity of exercises, improving compositions and especially executive skills. The increased requirements for performance skills have forced many coaches to pay special attention to high-quality basic and specialized training of gymnasts in all types of gymnastic all-around events. It is in this direc-

tion that the scientific search for improving the effectiveness of competitive activities of young gymnasts should be carried out.

Specialists from all over the world are trying to solve the following problems in the context of the emerging focus on early specialization, the ever-increasing coordination complexity, and the complexity of competitive combinations: improving the training process, planning sports training at the stage of pre-competition preparation, meeting all the requirements necessary to increase the effectiveness of training and subsequent competitive activities, step-by-step development of basic physical qualities and special motor abilities, distribution of training funds in a one-year cycle with effective use of training methods, consistent and high-quality development of elements, ligaments and their connections in combinations in gymnastic all-around events, comprehensive control over special physical and technical readiness of young gymnasts (Umarov, 2007)

In the studies of some authors, it is noted that the development of physical qualities in children of preschool and primary school age engaged in gymnastics is associated with a number of features associated with the growth and development of the body (Matveev, 1977; Rozin, 1997).

First, at this age, the development of one - quality has a positive effect on the growth of indicators of other qualities, which necessitates a comprehensive approach to their - development (Gaverdovskij, et al., 2005; Rozin, 1979).

Secondly, during the development of various functions of the body, there are sensitive periods when the increase in qualities occurs especially - intensively. According to experts, - pedagogical influences on the development of physical qualities of athletes should contribute to the most complete manifestation of those of them, the growth of which is expressed in varying degrees of age related development of students and which are especially essential for the formation of motor skills (Rozin, 2002; Uma-

rov, et al., 2004). At the same time, it is the indicators of developed muscle strength that are the natural substrate and basis for the manifestation and realization of personal physical qualities of an athlete.

Purpose of the study. To experimentally - determine the dynamics of development of speed and power capabilities of preschool and primary school children.

Research task. Determine the level of speed and strength qualities of children 5-7 years old engaged in gymnastics.

Methods

Pedagogical observations, questionnaires, control tests on the program of special physical training; electronic registration of temporary pairs -of jumping exercises; pedagogical experiment; mathematical and statistical analysis of the obtained data.

Contingent of test subjects. The experiment involved 90 children aged 5-7 years, students of the specialized children's and youth sports school for gymnastic sports in Tashkent.

Results and discussion

Polydynamometry data allow us to judge only the potential of muscle strength, make it possible to evaluate it in CGS (complex gradient of strength) only in a single-act action, or in extension. For practice, along with this, it is necessary to know how it is implemented in tests and in special exercises, in actions that are structurally similar to the main competitive exercise.

The starting point of any analysis of the development of sports results should be the analysis of changes in individual motor qualities. To determine the level -of physical fitness of children, we used the simplest exercises that do not require special skills and abilities, which to-

gether make up the control- program of tests on SPT.

Analysis of testing of the speed-power component of the SPT indicates a significant improvement in results with age. Both age-related factors and the impact of gymnastics are at the heart of improving results. For example, 7-year-old girls already jump 30 cm further than 5-year-olds. There is a relatively smaller increase in the result at this age in boys (18 cm). However, 5 and 6-year-old boys have a noticeable advantage in the shuttle run and long jump from a standing position (Table 1,2).

When assessing the initial level of speed and strength training of young gymnasts, it is advisable to compare the results of the long jump from a standstill with the average result shown by children who are not engaged in sports. The data in Table 3 show that children who are not engaged in sports are slightly inferior in this indicator to their peers who are, engaged in gymnastics.

Analyzing the data of testing exercises of a power nature, it should be noted that many students first encountered performing exercises of this kind (push-ups on parallel benches, holding the "angle" while hanging, etc.) and, as a result, the results of the first measurements were extremely low. However, even the data of the first tests indicate the inter-gender differences of young gymnasts. In pull-ups and push-ups, 5-6-year-old boys show better results than girls. However, seven-year-old girls found an advantage in the results in holding the "angle" in the hang and push-ups. In some cases, although this is statistically unreliable, five - year-old gymnasts show higher results than six-year-olds-in pull-ups, push-ups and holding the "angle" (in seven-year-olds). They are also characterized by a more intense dynamic of their development.

The indicator of lack of mobility in the

Table 1. Initial results of control tests among girls (n=30)

Tests	5 years		6 years		7 years	
	Result	Score	Result	Score	Result	Score
<i>Shuttle run 2x10 m, (sec)</i>	8,1	3,4	7,8	5,1	7,2	7,5
<i>Standing long jump (sm)</i>	104.2	0.5	114.8	1.3	133.4	4.7
<i>Pull-up to flexion of the arms at 90⁰, (quantity)</i>	1,3	2,1	0,7	0,9	3,1	3,1
<i>Push-up on two parallel benches, (quantity)</i>	7,4	2,3	7,1	2,2	7,1	2,4
<i>Lifting the legs in the vise by 90⁰, (quantity)</i>	8,7	4,3	11,0	5,3	12,0	5,6
<i>Holding the " angle " in the vise, (sec.)</i>	6,6	2,9	8,5	3,7	6,2	2,7
<i>Assessment for flexibility, (point)</i>		6,9		6,9		7,7
<i>Total points for SPF</i>		22.9		25.3		33.7

Table 2. Initial results of control tests among boys (n=30)

Tests	5 years		6 years		7 years	
	Result	Score	Result	Score	Result	Score
Shuttle run 2x10 m, (sec)	7,7	1,5	7,4	3,0	7,3	4,2
Long jump from a standing position (sm)	113.0	0.7	122.2	2.2	130.4	3.3
Pull-up to flexion of the arms to 90°, (quantity)	2,5	2,0	2,1	1,8	2,9	2,2
Push-up on two parallel benches, (quantity)	8.2	3.2	7.7	3.0	12.5	5.2
Lifting the legs while hanging to 90°, (quantity)	9,0	5,3	11,8	6,2	11,4	6,3
Holding the "angle" while hanging, (sec.)	5,2	2,5	5,8	2,6	3,1	1,5
Assessment for flexibility, (point)		6,7		6,7		6,1
Total points for SPT		21.9		25.5		28.7

joints was recorded by the sum of the deductions for errors in three exercises ("bridge", leaning forward from the saddle of the leg apart and any twine). It can be noted that the indicators of flexibility, both in girls and boys, are at a low level, judging by the score scale of assessments. But at the same time, there is a tendency to the advantage of the development of flexibility and mobility in the joints in girls.

Thus, when a gymnast is pushed away from a support, the shock absorption phase (when the muscles are working in a conceding mode) is followed by the actual push-off phase, when the muscles, having overcome the inertial - movement of the body mass, begin to contract, informing the system of movement from the support.

The data obtained indicate- an increase in

Table 3. Average long jump performance of 5-6 year olds and children who are engaged in sports ($\bar{x} \pm \delta$)

Age group	Girls		Boys	
	Who are engaged in	Not engaged	Engaged in	Not engaged
5 years old	104,2 ± 11,4	95 ± 10,9	112,9 ± 10,9	111,0 ± 11,3
6 years old	114,7 ± 11,6	111,0 ± 12,3	122,2 ± 12,8	116,0 ± 12,8

The ability of the muscles to stretch with instantaneous, significant tension and to then quickly, powerfully contract is at the heart of the repulsion in all jumps. Electronic recording of jump time parameters allows judging the level of speed-power qualities, in particular, jumping ability, by the time of repulsion from the support and flight time.

fluctuations in the time parameters of jumps. In 5-year-old girls and boys, the same indicators of the reaction of repulsion from the support are noted. At the same time, girls show a faster repulsion time compared to boys aged 6-7 years (Table 4).

The results of pushing away from the support in boys change little with age and only

Table 4. Electrical recording of jumping time parameters for young gymnasts aged 5-7 years ($\bar{x} \pm \delta$)

Age group	Repulsion time, (ml / sec)	P	Repulsion time, (ml / sec)	P
<i>Girls</i>				
5 years	0.210 ± 0.038	-	0.346 ± 0.021	-
6 years	0.183 ± 0.032	0.05	0.370 ± 0.036	0.05
7 years	0.177 ± 0.038	0.05	0.391 ± 0.035	0.05
<i>Boys</i>				
5 years	0.210 ± 0.051	-	0.333 ± 0.033	-
6 years	0.215 ± 0.063	0.05	0.384 ± 0.049	0.05
7 years	0.198 ± 0.041	0.05	0.382 ± 0.031	0.05

tend to improve. According to the second parameter (flight time), an improvement in the result is also observed with age. So, in girls for two years (from 5 to 7 leg), the indicator increases by 13.0%, in boys the greatest increase (15.3%) is noted from 5 to 6 leg. Moreover, the flight time of seven-year-olds does not significantly differ from six-year-olds.

The analysis of the time parameters of jumps allows us to conclude that the development of jumping ability is most successful at this age in girls. In the age aspect, there is an increase in results for all indicators to some extent. To determine the explosive force of the leg muscles, the indicators of the jump up from the Abalakov position were recorded (Table 5)

Attention is drawn to the fact that 6-year-

Conclusion

At the same time, the data of the first control tests made it possible to determine the level -of physical fitness of children aged 5-7 years, to identify the presence of intersex differences in the manifestation of physical qualities. A gradual improvement in the results in SPT tests was found with age only in tests that characterize speed- and strength training. For example, in the development of speed and strength qualities, there is a superiority of 5-6-year-old boys over girls- and the opposite picture in the development of flexibility.

In the course of research, a slowdown in the growth rate of results on SPT was found in 6 and 7-year-old gymnasts compared to 5-year-

Table 5. Results of the jump up from the place of young gymnasts

Indicators	Age group	Girls		Boys	
		($\bar{X} \pm \delta$)	t	($\bar{X} \pm \delta$)	t
Jump up from a standing position without a wave of hands, (cm)	5 years	28.3 ± 4.2	-	27.6 ± 3.7	-
	6 years	33.1 ± 3.8	7.0	31.1 ± 3.7	4.5
	7 years	35.0 ± 5.1	1.9	35.9 ± 5.1	4.6
Jump up from a place with a wave of hands, (cm)	5 years	30.7 ± 4.3	-	30.1 ± 4.2	-
	6 years	35.5 ± 4.4	6.5	34.6 ± 3.9	5.2
	7 years	38.6 ± 5.1	3.1	37.4 ± 6.5	2.2

old boys (11.2%) and 7-year-old girls (10.3%) are much better at repelling with their hands. At the same time, seven-year-old boys and six-year-old girls use this potential by 4.2% and 7.3%, respectively.

The correlation analysis carried out between the results of the electrical recording of the time parameters of jumps and jumps up from a place allowed us to establish some features of their relationship. Namely, the relationship found in 5-year-old boys between the results of the time of pushing off the support and jumping up from a place without waving hands ($r=0.711$) by the age of seven is preserved (at 6 years $r=0.740$, 7 years $r=0.505$, respectively).

A close relationship was also found between the flight time indicator and the results of the jump up from a place: at the age of 5 years with the result of the jump up from a place with a wave of the hands- $r=0.763$, and at the age of 6 and 7 years with the results of the jump up from a place without a wave of the hands ($r=0.542$ and 0.666 , respectively)

olds, especially in strength exercises, which indicates the need for scientific verification of the question of how this process is related to the course of the first growth jump during this period and what should be the correction of the methods and means used by young gymnasts at the stage of primary.

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