

COMPARATIVE CHARACTERISTICS OF THE STATE OF THE MOTOR FUNCTION OF BOYS AND GIRLS AGED 4-5 YEARS

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Annotation. It was considered the reliability of differences in the state of motor function between boys and girls aged 4-5 years. The study was conducted on the basis of pre-school establishments of Kirovohrad involving girls (n = 212) and boys (n = 188) aged 4-5 years. It is used a set of indicators that characterize motor skills, physiological and functional capacity of children. Identified the absence of significant differences in most parameters, except flexibility, performance of boys and girls of 4 years old. In 5 years old children differences in motor function of the state of most of the indicators are significant differences, except high-speed performance abilities and functional capacity of the system. At the organization of the educational process in physical education should be differentiated pedagogical influence on sexual differences.

Keywords: state, motor function, boys, girls.

Introduction

The period from the child's birth to entering school is the most critical stage of organism's development and is the most important in establishing of child's personality [3]. Timely and successful formation of child's motion function, especially in pre-school period of his (her) life, is of the first priority in the system of physical education. From this point of view selection of the most adequate physical education means is rather important. At the present stage searching of such means is rather urgent. Comprehensive physical preparation of pre-school children shall stipulate achievement of optimal motion (physical) abilities' development: quickness, dexterity, flexibility, endurance and strength.

The system of physical education means shall envisage realization of principle of child's comprehensive development, that conditions comprehensive influence on different sides of his (her) motion function, including complex development of all motion abilities. A number of scientists [1,2,3] are inclined to think that one of the most effective physical education means is outdoor games with elements of different kinds of sports.

But with organization of physical education training of pre-school children the demand in differentiating of different means' application, depending on sex of children of the regarded age, has not been clearly determined. In our opinion, solution of this problem is possible with studying of differences of motion function's state of 4-5 years old children, with the help of complex of indicators.

Pre school age – is the period of the most intensive growth and development of a child. Exactly in this age the foundations of future health, physical level are embedded, main features of personality develop. Health and workability of children depend, to large extent, on development of motor functions [1;5].

Training of main movements by pre-school children for development of their physical abilities lays foundation of general physical preparedness that facilitates harmonious development on such important stage – stage of preparation for studying at school [6].

The researches of physical state structure of preschool children are sparse [3], they concern, mainly, pupils of comprehensive schools and only a few of researches is devoted to the problem of correction of pre-school children's physical state [9-12].

Some authors [1, 5] point, that children have age and sex distinctions, requiring individual rate of training. That is why consideration of individual abilities and sex distinctions in training-education process is of great importance for increasing of efficiency of children's physical education. It is possible to realize thorough differentiated training, which implies adapting of educational material to individual and sex possibilities of children with the help of formation of sub groups with approximately equal level of preparedness and differentiating of training methods for them [1].

Psychological-pedagogical researches of Ye.S. Vilchkovskiy [1], S.G. Gavryshko [3] affirm, that pre-school children have great potentials for mastering of different movements.

Studying peculiarities of motion function of boys and girls, S. Gavryshko affirm that 4-5 years old boys have better results by indicators of motion abilities' development, than girls [5].

However, the scientists (Ye.S. Vilchkovskiy and S.G. Gavryshko) remark that they shall be used carefully and with consideration of sex peculiarities of organism's development in pedagogical process.

The present scientific research has been fulfilled as per combined plan of scientific & research works of Kirovograd state pedagogic university, named after Volodymyr Vinnichenko, for 2012.

Purpose, tasks of the work, material and methods

The purpose of the research is to compare motion function's state of 4-5 years old boys and girls of pre-school educational establishments of Kirovograd.

The tasks of the research:

1. Analyze the state of motion function of 4-5 years old boys and girls.
2. Determine probability of distinctions in the state of motion function of 4-5 years old boys and girls.

The methods of the research: anthropometry (height, weight); functional tests (Shtange's test, Gency's test; psycho-physiological (tapping test, 10 sec., 30 sec.); testing of motion abilities (20 m run, shuttle run 4x9 m, long jumps from the spot, bending of torso forward from sitting position, hanging on bent arms, raising of torso into sitting position).

Organization of the researches: the research was carried out on the base of pre-school educational establishments of Kirovograd with involving of girls (n=202) and boys (n=188) and with the help of commonly used methodic in the following sequence: 1st day – height, weight, Stange's test, Genchy's test; 2nd day 20 m run, shuttle run 4x9 m, long jump, hanging on bent arms. The 3rd day – bending of torso forward from sitting position, raising of torso into sitting position, tapping test 10 sec. and 30 sec.

Results of the researches

In table 1 there are presented indicators of motion abilities, of function potentials and morphological indicators of 4-5 years old boys and girls. The presented data witness about rather big coefficients of variation of the most of indicators, excluding only height indicators. Big coefficients of variation, in our opinion, can be conditioned by different factors, including different typological peculiarities of children.

Table 1

Indicators of motion function's state of 4years old boys and girls

Indicators	Boys (n=71) ($\bar{x} \pm \sigma$)/V	Girls (n=78) ($\bar{x} \pm \sigma$)/V	Δx	$\Delta x \%$	P
Quickness					
Run 20 m, sec.	(6,20 \pm 0,80)/12,92	(6,46 \pm 0,62)/9,66	0,26	4,26	>0,05
Dexterity					
Shuttle run m, sec.	(17,36 \pm 2,06)/11,85	(17,355 \pm 1,91)/10,99	0,01	0,03	>0,05
Static strength					
Hanging on bent arms, sec.	(4,96 \pm 7,82)/157,58	(4,72 \pm 4,44)/93,94	0,24	4,84	>0,05
Power endurance					
Raising of torso in sitting position per 1 min., times.	(8,89 \pm 5,04)/56,73	(9,88 \pm 6,61)/66,89	1,00	11,22	>0,05
Explosive force					
Long jump from the spot, cm.	(68,14 \pm 25,42)/37,31	(67,62 \pm 18,80)/27,81	0,53	0,77	>0,05
Flexibility					
Torso forward bent cm.	(5,31 \pm 3,78)/71,22	(8,15 \pm 3,72)/45,61	2,84	53,56	<0,05
Force of nervous processes					
Tapping test 30 sec., times.	(84,62 \pm 16,39)/19,36	(91,97 \pm 15,29)/16,62	7,35	8,69	<0,05
Mobility of nervous processes					
Tapping test 10 sec, times.	(37,31 \pm 8,40)/22,52	(37,47 \pm 10,12)/27,02	0,16	0,44	>0,05
Morphological indicators					
Height, cm.	(107,25 \pm 5,04)/4,70	(107,45 \pm 5,58)/5,19	0,20	0,18	>0,05
Weight, kg.	(17,16 \pm 2,10)/12,24	(16,73 \pm 3,72)/22,23	0,43	2,52	>0,05
Power of functional system					
Shtange's test, sec.	(11,36 \pm 6,74)/59,31	(15,65 \pm 9,57)/61,14	4,29	37,76	<0,05
Genchy's test, sec.	(5,51 \pm 3,33)/60,48	(7,77 \pm 5,46)/70,30	2,26	40,95	<0,05

Analysis of the obtained data permits to affirm that there is a targeted trend of boys' indicators' manifestation, which were studied, in comparison with girls.

Analysis of the obtained data of boys' and girls' motion abilities shoes that the highest distinctions are in indicators of flexibility. 4 years girls have better by 53.6% indicators than boys, see fig. 1.

By the level of power endurance girls also have better indicators (11,2%). By manifestation of quickness, static strength and explosive force boys' indicators are better, but difference is within 5%. No difference was found in indicators of dexterity of boys and girls. The presented data show that the differences between indicators, which were studied, are not statistically confident (P>0,05). Only indicator of flexibility is an exclusion (P<0,05).

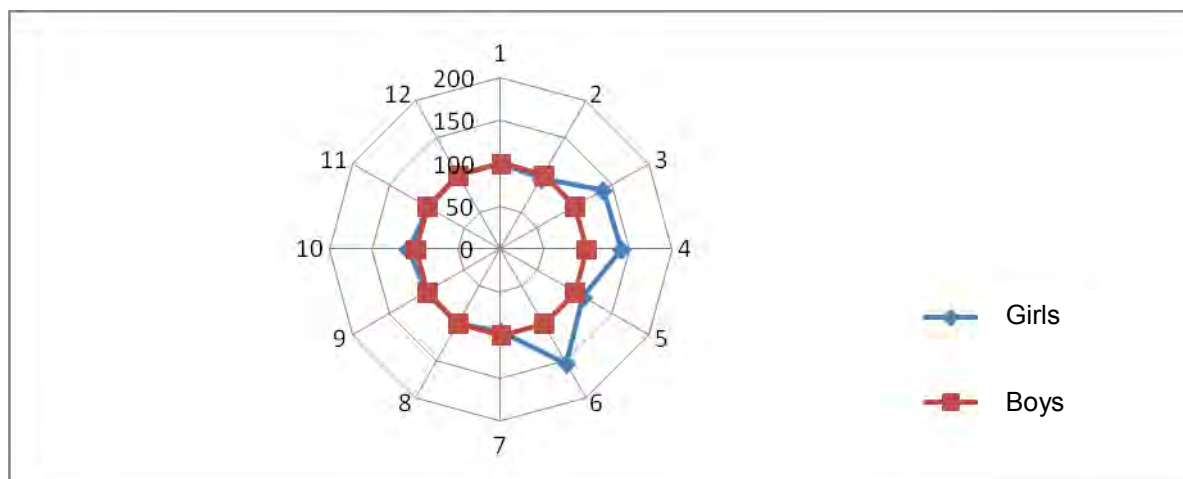


Fig.1 Distinctions of indicators of 4 years old boys' and girls' motion function (percentage)

Notes. 1) Shuttle run 60r 4x9 m; 2) Hanging on bent arms; 3) Shtange's test; 4) Genchy's test; 5) Raising of torso in sitting position; 6) Torso forward bent from in sitting position; 7) 20 m run; 8) Long jump from the spot; 9) Tapping test 10 sec.; 10) Tapping test, 30 sec.; 11)Weight; 12) Height.

The data of morphological indicators of 4 years old boys show that the difference between height indicators is nearly absent in comparison with 4 years old girls (0,2%), by weight indicators boys have little priority, by 2,5% (see fig. 1). No confident distinctions were found in these indicators ($P>0,05$).

Analysis of psycho-physiological abilities of 4 years old children shows that they are manifested better by girls. For example, the force of nervous processes is by 8,7%, higher, mobility – by 0,4% (see fig.1). Confident distinctions were registered only for the force of nervous processes ($P<0,05$).

Results of girls' functional system's power are confidently ($P<0,05$) higher, than the boys': Shtange's test – by 37,8%, Genchy's test – by (see fig. 1).

In table 2 indicators of motion abilities of 5 years old boys and girls are presented.

Table 2

Indicators of motion function's state of 5 years old boys and girls

Indicators	Boys (n=117) ($\bar{x}\pm\sigma$)/V	Girls (n=134) ($\bar{x}\pm\sigma$)/V	Δx	$\Delta x \%$	P
Quickness					
Run 20 m, sec.	(5,54±0,78)/14,07	(5,88±0,88)/14,99	0,34	1,51	>0,05
Dexterity					
Shuttle run m, sec.	(14,78±1,86)/12,56	(15,45±1,58)/10,21	0,67	2,99	<0,05
Static strength					
Hanging on bent arms, sec.	(6,93±6,33)/91,35	(5,02±5,75)/114,53	1,91	8,55	<0,05
Power endurance					
Raising of torso in sitting position per 1 min., times.	(15,91±7,80)/49,02	(14,37±6,32)/43,98	1,53	6,86	<0,05
Explosive force					
Long jump from the spot, cm.	(98,40±17,54)/17,83	(89,37±15,33)/17,15	9,04	40,41	<0,05
Flexibility					
Torso forward bent cm.	(4,48±3,70)/82,70	(9,28±4,41)/47,46	4,80	21,49	<0,05
Force of nervous processes					
Tapping test 30 sec., times.	(95,04±16,96)/17,84	(96,00±19,16)/19,96	0,96	4,28	<0,05
Mobility of nervous processes					
Tapping test 10 sec, times.	(43,21±10,92)/25,27	(40,09±12,07)/30,11	3,12	13,93	<0,05
Morphological indicators					
Height, cm.	(115,27±4,87)/4,23	(113,76±3,83)/3,37	1,51	6,75	<0,05
Weight, kg.	(19,96±3,57)/17,87	(19,42±3,18)/16,38	0,54	2,43	<0,05

Power of functional system					
Shtange's test, sec.	(16,82±11,17)/66,41	(17,15±8,98)/52,32	0,33	1,49	>0,05
Genchy's test, sec.	(8,24±3,78)/45,83	(8,19±4,41)/53,90	0,06	0,25	>0,05

Analysis of the obtained data of 5 years old children permits to affirm that boys' indicators, which were studied, are higher than the girls; ones.

For example, the boys' level of motion abilities' manifestation is higher in comparison with the girls: quickness – by 6,1%, explosive force – by 9,2%, dexterity – by 4,5%, power endurance – by 9,6%, static strength – by 27,6%. At the same time flexibility indicators of 5 years old boys are much lower – by 107,3% (see fig. 2). With it changes of parameters are statistically confident ($P < 0,05$) except parameter of quickness ($P > 0,05$).

Comparison of morphological indicators also showed boys' higher results: height – by 1,3%, weight – by 2,7%. With it distinctions are confident ($P < 0,05$) (see fig. 2).

Analysis of 5 years old boys and girls by functional indicators showed the girls' higher indicators by Shtange's test (by 2%), but lower than boys' by Genchy's test (by 0,7%) with the absence of confident distinctions ($P > 0,05$) (see fig.2).

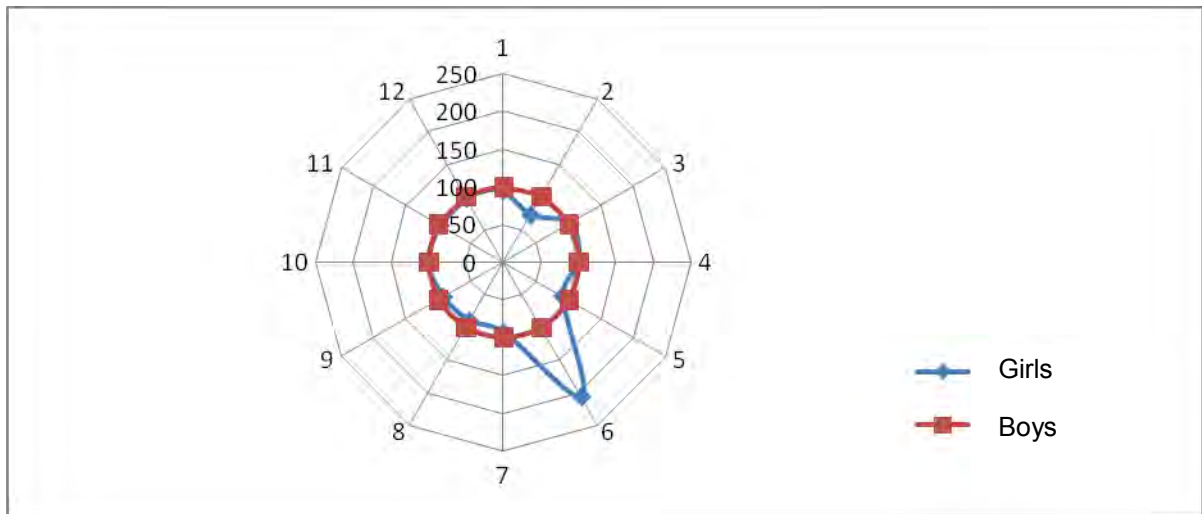


Fig.1 Distinctions of indicators of 5 years old boys' and girls' motion function (percentage) (see notes to fig. 1)

Summary

Results of the researches showed that 4 years old boys and girls have no confident distinctions in most of indicators. Confident distinctions were found only for indicators of flexibility, force of nervous processes and functional system's power. 5 years children have confident distinctions of most of indicators, except indicators of quickness and functional system's power ($P > 0,05$). The obtained data permit to make general conclusion: with organization of physical education training process, it is necessary to differentiate pedagogic influence starting from 5- years' age of children, by their sex distinctions.

The prospects of further scientific researches imply determination of system of differentiated pedagogic influences in compliance with sex distinctions of 4-5 years old children.

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