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Functional and motor fitness of 7-8 form pupils as factor of health improvement

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Abstract

Purpose: to determine special gender aspects of 7-8 form pupils' functional and motor fitness. *Material:* in the research participated boys: 7th form (n=24); 8th form (n=35); girls: 7th form (n=31); 8th form (n=14). *Results:* analysis shows that between 7th form boys and girls there are statistically confident differences in functional tests ($p<0.001$). By functional state of respiration and blood circulation functions 7th form boys and girls were assessed as healthy but not trained; by Serkin's test they had latent circulatory inefficiency. Statistically confident differences between 8th form boys were registered in tests 3-8, which characterized power, speed-power and coordination fitness ($p<0.001$). By results of other motor tests differences between mean values were statistically unconfident ($p>0.05$). *Conclusions:* gender aspects of seven form pupils' motor fitness are power abilities and ability to assess power parameters of movements; in eighth form they were ability to perceive motor power parameters and static strength.

Key words: boys, girls, functional fitness, coordination fitness, power fitness, motor abilities.

Introduction

Physical education of secondary school age pupils has own specific features, which are conditioned by their anatomic- physiological and psychological features. Consideration of organism's natural growth regularities permits to selectively and purposefully influence on pupils by means of physical education. Their main aims are: physical perfection, optimal physical condition and readiness to different forms and ways of life activity [1, 23].

One of conditions of pupils' motor fitness increase is organization of pedagogic control on the base of children and adolescents physical development's study both at physical culture lessons [20, 24], and in conditions of sport training [14, 16, 17]. The procedure of pedagogic control implies classification of motor and functional condition's current state, because taking decisions in control over children's and adolescents' physical education depends on them.

So, lassification of motor fitness and determination of gender special aspects are of practical importance for taking decisions in physical education control as well as in working out effective programs of children's and adolescents' physical education.

In other works [13, 19] the models of motor abilities' development, which can be used for current and final control of children's and adolescents' motor fitness, are analyzed. Besides, special aspects of 7-8th form girls are determined [6], as well as 8–9th form [10]. It was found that canonic discriminat function can be used for assessment and prognostication of secondary form girls' functional and motor fitness as well as dynamic of 7-8th, 8-9th and 9-11th form boys' motor fitness [8, 9, 11]. It was found that for determination of informative indicators for every form factorial analysis can be used, while discriminant analysis can be used for assessment of motor fitness dynamic.

However, in available scientific literature it is paid insufficient attention to modeling method application for classification children's and adoloscents' motor and functional; fitness.

That is why, determination of gender special aspects of secondary form pupils' functional and motor fitness is still relevant.

The purpose of the research - to determine special gender aspects of 7-8 form pupils' functional and motor fitness.

Material and mehods

Participants: in the research participated boys: 7th form (n=24); 8th form (n=35); girls: 7th form (n=31); 8th form (n=14).

Organization of the research: seven form pupils' functional and motor fitness were registered by results of Shtange's, Genchy's, Serkin's tests and motor tests.

Statistical analysis was fulfilled with the help of SPSS 22 program.

Results

Results of our researches are given in table. Analysis showed that between 7th form boys and girls there are statistically confident differences ($p<0.001$) in functional tests' results. By functional state of respiratory and blood circulation functions 7th form boys and girls are assessed as healthy, but not trained; by Serkin's test they have latent blood circulation inefficiency.

Table 1. Results of 7-8th form boys' and girls' functional fitness

№	Description of tests	Form	Boys		Girls		t	p	CD	
			x	s	x	s			Rank	Function
1	Jumps with "additions", times	7	4.17	.87	3.80	.83	1.561	> 0.05	10	.036
		8	2.80	.93	2.28	.82	1.798	> 0.05	7	.129
2	Tim parameters of movements, error, sec.	7	1.08	.83	.93	.57	.781	> 0.05	11	.018
		8	.77	.569	.58	.29	1.194	> 0.05	9	.086
3	Assessment of perception of power parameters of movements, error, %	7	12.13	1.68	7.23	1.09	13.115	< 0.001	3	.299
		8	14.71	1.85	7.02	3.65	9.778	< 0.001	1	.703
4	Shuttle run 4×9 m, sec.	7	12.74	.72	13.97	.73	-6.249	< 0.001	7	-.142
		8	10.93	.81	11.89	.69	-3.928	> 0.05	4	-.283
5	Pressing ups in lying position, times	7	24.00	4.10	10.84	3.08	13.592	< 0.001	2	.310
		8	15.86	3.26	15.64	9.21	.121	> 0.05	11	.009
6	Chin ups, times	7	11,04	1.27	3.65	.75	26.937	< 0.001	1	.614
		8	6.26	2.39	5.14	2.50	1.453	> 0.05	8	.105
7	Hanging on bent arms, sec.	7	27.00	4.00	18.55	3.30	8.592	< 0.001	4	.196
		8	39.17	13.29	14.00	9.59	6.427	< 0.001	2	.462
8	Long jump from the spot, cm	7	163.25	4.33	151.42	5.71	8.430	< 0.001	5	.192
		8	185.88	11.74	173.92	10.95	3.281	< 0.002	5	.236
9	Shtange's test, sec.	7	39.92	3.19	32.68	4.22	6.992	< 0.001	6	.159
		8	40.86	10.79	57.80	19.41	-3.902	< 0.001	3	-.287
10	Genchy's test, sec.	7	23.96	2.59	20.26	3.29	4.518	< 0.001	8	.103
		8	32.26	7.15	31.82	10.72	.166	> 0.05	10	-.032
11	Serkin's test, sec.	7	17.83	3.03	14.77	3.03	3.713	< 0.001	11	.085
		8	23.80	5.65	18.70	4.50	3.010	<.004	6	.198

Notes: CD – structural coefficients of canonic discriminant function (the rank was calculated separately for 7th form and for 8th form)

Analysis of testing results shows that there are statistically confident differences between 8th form boys and girls in functional tests ($p<0.001$). By functional state of respiratory and blood circulatory functions 8th form boys and girls are assessed as healthy but not trained. By Serkin's test the are assessed as badly trained.

Statistically confident differences between 8th form boys and girls are registered in tests № 3, 7–9, 11, which characterize coordination, speed-power and static fitness ($p<0.001$). By results of other motor tests differences between mean values are statistically not confident ($p>0.05$).

In table we gave results of discriminant analysis, which permits to classify seven form pupils by their functional fitness and motor fitness. Structural coefficients of canonic discriminant function (which are coefficients of variables with function) show that function is the most substantially connected with variables № 6, 5, 3: difference between seven form boys and girls was registered in motor abilities' level (strength and control of power parameters of movements).

Results of groups' classification show that 100% of outcoming grouped observations are classified correctly. Thus, canonic discriminant function can be used for classification of gender differences in seven form pupils.

In table also the results of discriminat analysis, which permits to classify eight form pupils by functional state and motor fitness, are given. Structural coefficients of canonic discriminant function (which are correlation coefficients

of variables with function) point that function is most closely connected with variables № 3, 7: so substantial difference between eight form boys and girls is observed in coordination and static strength.

Results of groups' classification show that 98.0% of outcoming grouped observations are classified correctly. Thus, canonic discriminant function can be used for classification of gender differences in eight form pupils.

Discussion

The obtained by us data supplement results of our previous works about special aspects of motor fitness and effectiveness of discriminat function's application in pedagogic control over children's and adolescents' physical education [8, 19]. The results of the present work point at dmand in structural and functional analysis of children's and adolescents' motor fitness and are based on studies of other scientists [15, 18, 21, 22, 25].

In experiment we determined that with the set of the offered variables it is possible to statistically confidently ($p<0.001$) separate boys from girls in 7^{th} and 8^{th} forms. It supplements he data about discriminat function's effectiveness in pedagogic control of schoolchildren's physical fitness [2-5, 12].

Conclusions

1. Analysis witnesses that between 7^{th} form boys and girls there are statistically confident differences ($p<0.001$). By functional state of respiratory and blood circulation functions 7^{th} form boys and girls were assessed as healthy but not trained. By Serkin's test they have latent blood circulation inefficiency.

2.Statistically confident differences between 8^{th} form boys and girls were registered in tests № 3–8, which characterize power, speed-power and coordination fitness ($p<0.001$). By results of other tests differences between mean values were not statistically confident ($p>0.05$).

3. Analysis of testing results showed that between 8^{th} form boys and girls there are statistically confident differences in functional tests ($p<0.001$). By functional state of respiratory and blood circulation functions 8^{th} form boys and girls are assessed as healthy but not trained. By Serkin's test all they are badly trained.

4.Statistically confident differences in 8^{th} form boys and girls were registered in tests № 3, 7–9, 11, which characterize coordination, speed-power and static fitness ($p<0.001$). By results of other motor tests differences between mean values were not statistically confident ($p>0.05$).

5. On the base of discriminant analysis it was found that gender special aspects of seven form pupils were strength and ability to perceive power parmeters of movements; in eight form – ability for assessment of power parameters of movements and static strength.

References

1. Baltsevych, V.K. (2000). *Onto kinesiology of a man*. Moscow, Theory and practice of physical culture.
2. Ivashchenko, O. V., Khudolii, O. M., Yermakova, T. S., Wiesława, P., Radosław, M., & Błażej, S. (2015). Simulation as method of classification of 7-9th form boy pupils' motor fitness. *Journal of Physical Education and Sport, 15*(1), 142-147. doi:10.7752/jpes.2015.01023
3. Ivashchenko, O. V., Yermakova, T. S., Cieslicka, M., & Muszkieta, R. (2015). Discriminant analysis as method of pedagogic control of 9-11 forms girls' functional and motor fitness. *Journal of Physical Education and Sport, 15*(3), 576-581. doi:10.7752/jpes.2015.03086
4. Ivashchenko, O. V., Yermakova, T. S., Cieślicka, M., & Śukowska, H. (2015). Discriminant analysis in classification of motor fitness of 9-11 forms' juniors. *Journal of Physical Education and Sport, 15*(2), 238-244. doi:10.7752/jpes.2015.02037
5. Ivashchenko, O., Khudolii, O., Yermakova, T., Iermakov, S., Nosko, M., & Nosko, Y. (2016). Factorial and discriminant analysis as methodological basis of pedagogic control over motor and functional fitness of 14–16 year old girls. *Journal of Physical Education and Sport, 16*(2), 442-451. doi:10.7752/jpes.2016.02068
6. Ivashchenko, O.V. (1988). *Standard indicators of training loads at initial stage of training of junior, 6-8 years old girls-gymnasts.* Cand. Diss. Moscow, 17.
7. Ivashchenko, O.V. (2016). Methodic of pedagogic control of 16–17 years' age girls' motor fitness. *Pedagogics, psychology, medical-biological problems of physical training and sports, 5,* 26–32. doi:10.15561/18189172.2016.0504
8. Ivashchenko, O.V., Karpunec, T.V., & Krinin, Iu.V. (2014). Age dynamic of functional, coordination and power fitness of $8\text{-}9^{th}$ forms' girls. *Teoria ta metodika fizicnogo vihovanna, 1,*34-42. doi:10.17309/tmfv.2014.1.1043
9. Ivashchenko, O.V., & Khudolii, O.M. (2014). Peculiarities of functional, coordination and power fitness of 8-9 forms' boys. *Teoria ta metodika fizicnogo vihovanna, 1,*15-23. doi:10.17309/tmfv.2014.1.1041
10. Ivashchenko, O.V., Pashkevich, S.A., & Krinin, Iu.V. (2014). Comparative characteristic of functional, coordination and power fitness of 8-9 forms' boys. *Teoria ta metodika fizicnogo vihovanna, 2,*31-39. doi:10.17309/tmfv.2014.2.1099
11. Ivashchenko, O.V., & Shepelenko, G.P. (2014). Comparative characteristic of coordination and power fitness of secondary forms' pupils. *Teoria ta metodika fizicnogo vihovanna, 2,*22-30. doi:10.17309/tmfv.2014.2.1096
12. Khudolii, O. M., Iermakov, S. S., & Prusik, K. (2015). Classification of motor fitness of 7-9 years old boys. *Journal of Physical Education and Sport, 15*(2), 245-253. doi:10.7752/jpes.2015.02038
13. Khudolii, O.M., & Titarenko, A.A. (2010). Osoblyvosti rozvytku rukhovykh zdibnostey u khlopchykiv molodshoho shkil'noho viku [Peculiarities of motor abilities' development in boys of primary school]. *Teoria ta*

metodika fizicnogo vihovanna, 8, 3–12. doi:10.17309/tmfv.2010.8.644
14. Khudolii, O.M., & Iermakov, S.S. (2011). Regularities of the learning process of young gymnasts. *Teoria ta metodika fizicnogo vihovanna*, *5*,3-18. doi:10.17309/tmfv.2011.5.707
15. Khudolii, O.M., Iermakov, S.S., & Ananchenko, K.V. (2015). Factorial model of motor fitness of junior forms' boys. *Journal of Physical Education and Sport, 15*(3), 585–591. doi:10.7752/jpes.2015.03088
16. Khudolii, O.M., & Ivashchenko, O.V. (2013). Conceptual modeling approaches to learning and development of motor skills in children and adolescents. *Teoria ta metodika fizicnogo vihovanna*, 10, 3-16. doi:10.17309/tmfv.2013.2.1012
17. Khudolii, O.M., & Ivashchenko, O.V. (2014). *Simulation of training process and development of children's and adolescents' motor skills*, Kharkiv, OVS, 320.
18. Khudolii, O.M., Ivashchenko, O.V., Iermakov, S.S., & Rumba O.G. (2016). Computer simulation of junior gymnasts' training process. *Science of Gymnastics Journal, 8* (3), 215 – 228.
19. Khudolii, O.M., Ivashchenko, O.V., & Pimenov, O.O. (2012). Specific features of power fitness of senior pupils. *Teoria ta metodika fizicnogo vihovanna, 9,*37-41. doi:10.17309/tmfv.2012.9.822
20. Khudolii, O.M., & Zabora, A.V. (2001). Theoretical foundations of curriculum of physical culture at school. *Teoria ta metodika fizicnogo vihovanna*, *1*,3-12. doi:10.17309/tmfv.2001.1.1
21. Kozina, Z.L., & Popova, N. (2013). Faktornaia struktura fizicheskoj podgotovlennosti devochek 11–15 let [Factorial structure of physical fitness of 11–15 years' age girls]. *Teoria ta Metodika Fizicnogo Vihovanna, 4,* 48–52.
22. Kravchuk, T.M., & Kurochka, O.S. (2013). Primenenie sredstv baleta v fizicheskom vospitanii devochek starsheklassnic [Application of body ballet means in physical education of senior pupils-girls]. *Teoria ta Metodika Fizicnogo Vihovanna, 4,* 40–47.
23. Nosko, M.O., & Nosko, Y.N. (2014). Peculiarities of physical development of primary school pupils. *Bulletin Chernihiv National Pedagogical University*. *118(3)*,205-211.
24. Shiian, B.M., & Papusha, V.G. (2005). *Methodic of sport-pedagogic disciplines' teaching in higher educational establishments of physical education and sports*. Kharkiv, OVS, 208.
25. Tkachenko, S.N. (2014). Health-technology in the classroom with the girls playing football of secondary school age. *Pedagogics, Psychology, Medical-Biological Problems of Physical Training and Sports*, *11*, 61–65.