THE LEVEL OF GENERAL PHYSICAL PERFORMANCE OF PUPILS ATTENDING THE FIRST GRADES AT PRIMARY SCHOOLS IN BANSKÁ BYSTRICA

IVAN ČILLÍK - RASTISLAV KOLLÁR - JURAJ KREMNICKÝ - PAVOL PIVOVARNIČEK - MARTINA KOVÁČIKOVÁ
ONDREJ ĎURJÁK - SIMONA ŠVACHOVÁ - ANNA MURÍNOVÁ
Department of Physical Education and Sport
Faculty of Humanities
Matej Bel University in Banská Bystrica
Slovakia

ABSTRACT

This contribution deals with the level of general physical performance of 7 years old pupils attending primary schools. First-grade pupils at primary schools in Banská Bystrica were tested. Tested group consisted of pupils from all primary schools. The following indicators of general physical performance were monitored: sit-and-reach, standing long jump, sit-ups in 30 s, flexed arm hang, shuttle run 4x10 meters, endurance shuttle run. Also basic somatic indicators such as body height, body weight and BMI were found out. However, we monitored an after-school physical activity as well. The results are compared to other authors dealing with the general physical performance of mentioned age group.

Keywords: physical education, primary schools, first-grade pupils, general physical performance, somatic characteristics.

INTRODUCTION

Generally, an unsatisfactory level of physical activities, general physical performance as well as the health of children is evident during the last period. In the past, but not long ago a number of measurements and testing of the level of general physical performance of school population was performed. For evaluation of physical performance of school population are currently used mainly 3 standardized test batteries: the European Test EUROFIT (Council of Europe, 1988), Czech Test UNIFIT (Měkota, Kovář and others, 1995; Chytráčková, 2002) and test batteries for the selection of talented individuals in sport, e.g. Brown (2001). The author Šimonek (2012) mentions other test batteries as well. These mentioned test batteries are, by their nature and normative way to evaluate results of test, focused on the performance component of physical fitness.

Based on the findings of the previous reviews of physical fitness and physical performance of children, we conclude that the innovation of motor tests and verification should lead to a simplification of diagnosis and increase the overall motivation of teachers and pupils for physical activity. Our work is at the beginning of this process which is focused on a group of children from Banská Bystrica. The aim of this contribution is to find out the level of general physical performance and the level of physical development of first-grade pupils in Banská Bystrica. The project is an agreement on cooperation between the town Banská Bystrica and Matej Bel University. This project was organized by Department of Physical Education and Sport, Faculty of Humanities.

METHODS

There are 12 public schools in Banská Bystrica. Overall, we tested 492 pupils out of 572 first-grade pupils and this is 86 %. Remaining 14 % were not tested because of the absence on teaching process or they could not exercise mainly because of the health reasons. One of the school is without a gym, therefore these pupils were not tested as well (10). Tested pupils were from eleven public schools. They were from all classes of first grades of public schools in the number of 252 boys and 240 girls. The average age of tested boys was 7.39 decimal years during the measuring and the average age of tested girls was 7.24 decimal years. So, the group of tested boys was older about 0.14 years.

Measurements were made by teachers and PhD students, Master and Bachelor students in April-June 2013. These measurements were always performed in the morning from 8 o'clock to 12 o'clock under standard conditions of the gym. As a rule, one class was tested during one lesson. Measuring process:

1. After arriving to the gym pupils received race numbers and they became familiar with the aim of the research.

2. Asking for basic identification data of tested pupils: name, date of birth, involvement in organized physical and sport activities. Basic identification data were provided by classroom teachers.

3. Warming-up.

4. Measuring of the level of physical development: body height, body weight. BMI was calculated on the basis of this.

Body height – measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002) with the accuracy of 0.5 cm.

Body weight – measuring using a digital scale, with the accuracy of 0.1 kg.

5. Measuring of the level general physical performance: sit-and-reach, standing long jump, sit-ups, flexed arm hang, shuttle run 4 x 10 meters, and endurance shuttle run.

Sit-and-reach test (SRT) - measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002). Better of two attempts is counted with the accuracy of 1cm.

Standing long jump (SLJ) - measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002). The best attempt out of three is counted with the accuracy of 1cm.

Sit-ups (SUT)- measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002). The number of correctly performed exercises during 30 s is recorded.

Flexed arm hang (FAH) - measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002). Flexed arm hang is measured with the accuracy of 0.1 s.

Shuttle run 4 x 10 meters (4 x 10) – the task was always to cross the opposite or starting line by one foot. The time required to overcome 4 x 10 m sections with the accuracy of 0.1s is measured.

Endurance shuttle run (ESR) - measuring according to the methodology Moravec – Kampmiller – Sedláček and others (2002). The number of overcame 20 m sections is recorded.

The order of the tests was not strictly followed due to time, but endurance shuttle run was always performed as the last one.

Statistical significance was processed in the program SPSS Statistic. We used a parametric unpaired T-test to test the significance of difference between medium values. Results were evaluated at the 5 % level of significance. We used basic statistical characteristics of central tendency and dispersion such as average, standard deviation, minimum measured values and maximum measured values. We used basic logical methods to evaluate and interpret the results.

RESULTS

Results show a different level of monitored parameters considering boys and girls (Table 1, 2). Girls achieve on average better level of trunk flexibility which was determined using a sit-and-reach test. Contrary, boys achieve better average values in explosive power of lower limbs (standing long jump), in dynamic endurance strength of abdominal and hip-thigh muscles (sit-ups), running speed with changes of direction (shuttle run 4 x 10 meters) and running endurance capacity (endurance shuttle run). We recorded statistically significant difference in the following tests: standing long jump, sit-ups and shuttle run 4 x 10 meters in favor of boys and in the sit-and-reach test in favor of girls.

Referring to the level of minimum and maximum performance, differences in used tests are not as clear as the average values. The girls achieved the best results in the sit-and-reach test, flexed arm hang and endurance shuttle run. The boys achieved the best performance in the following tests: standing long jump, sit-ups and shuttle run 4 x 10 meters. The girls achieved the worst result in standing long jump and the boys in the sit-and-reach test and shuttle run 4 x10 meters. There are three tests in which the girls and boys achieved the same worst performance: sit-ups, flexed arm hang and endurance shuttle run. In two of these tests, sit-ups and flexed arm hang, we recorded zero values. It means, in both groups were individuals who had not done one cycle in the sit-ups test and did not maintain the desired position in the flexed arm hang test.

We also recorded higher average somatic indicators in a group of boys – body height (boys were on average higher about 1.71cm), body weight (boys were on average heavier about 1.12 kg) and in BMI about 0.22. Statistically significant difference was found in body height and weight in favor of boys. Statistically significant difference was not recorded in BMI.

Table 1 Monitored indicators of general physical performance and physical development in group of boys (B)

B	AGE	SRT	SLJ	SUT	FAH	4 x 10	ESR	HEIGHT	WEIGHT	BMI
		(cm)	(cm)	(n)	(s)	(s)	(n)	(cm)	(kg)	(i)
x	7.39	17.57	121.27	15.23	16.88	14.13	21.47	127.33	26.84	16.38
SD	0.43	5.81	18.95	4.90	17.07	1.29	11.79	5.82	5.30	2.22
min	6.68	2	68	0	0	11.4	3	111.00	17.90	12.40
max	9.28	31	179	31	89	19.7	66	143.50	48.00	26.30

Table 2 Monitored indicators of general physical performance and physical development in group of girls (G)

G	AGE	SRT	SLJ	SUT	FAH	4 x 10	ESR	HEIGHT	WEIGHT	BMI
		(cm)	(cm)	(n)	(s)	(s)	(n)	(cm)	(kg)	(i)
x	7.25	20.83	111.49	13.07	16	14.54	19.87	125.62	25.72	16.16
SD	0.34	5.08	18.39	5.59	14.43	1.14	10.2	6.22	5.81	2.57
min	6.14	5	57	0	0	12.0	3	111.50	14.30	11.60
max	8.45	35	165	29	90	18.7	67	143.00	55.90	33.10

DISSCUSSION

We used two test batteries in this contribution – EUROFIT and UNIFIT. Based on analysis of numerically limited files, it was concluded that the diagnosis of motor skills of children younger school age is characterized by excessive width of "diagnostic coverage", e.g. Turek (1996, 1999). Therefore, we wanted to apply a battery that would cover the whole range of general physical performance, but through reducing the number of test items. We have omitted the test "flamingo" because of its lack of validity and questionable implementation in younger school age as the author Turek (1999) claims. Whereas speed capabilities were investigated using another test (shuttle run 4 x 10 meters), we omitted plate tapping which is used to measure frequency speed of arm. We also omitted a hand dynamometer because we used the flexed arm hang test to find out a static strength of upper limbs. Instead of 10 x 5 m we used shuttle run test 4 x 10 m, considering its duration and easier implementation. Although, the test 4 x 10 m can be found in the battery UNIFIT, we simplified it considering the age of children. Our test battery is nearly identical to Brown's battery (2001) for talent identification.

Seven years old boys achieve better level in five tests of general physical performance when comparing our group of boy and girls. The tests are following: standing long jump, sit-ups, flexed arm hang, shuttle run 4 x 10 m and endurance shuttle run. In three of them differences are statistically significant. The girls achieve statistically better level in trunk flexibility.

We compare the results of our groups with the group from Slovakia (1993) according to Moravec-Kampmiller-Sedláček and others (2002) and with the group of children from eastern Slovakia according to Turek (1999) and Ružbarská-Turek (2007).

When comparing the group of boys with the groups from Slovakia (1993), we conclude lower level in all the tests, except the flexed arm hang test (Table 3). The boys from Banská Bystrica mostly lag behind in explosive power of lower limbs and in running endurance capacity. The comparison of the boys from eastern Slovakia shows bigger equality of both groups. The boys from Banská Bystrica are better in the following tests: standing long jump, flexed arm hang and endurance shuttle run. The boys from eastern Slovakia are better in the following tests: the sit-and-reach test and one group is better in the sit-up test and one of them is worse than our group.

Table 3 Comparison of average results of our group with other researches – boys

Boys	AGE	SRT	SLJ	SUT	FAH	4 x 10	ESR	HEIGHT	WEIGHT	BMI
		(cm)	(cm)	(n)	(s)	(s)	(n)	(cm)	(kg)	(i)
BB (2013) n = 252	7.39	17.57	121.27	15.23	16.88	14.13	21.47	127.33	26.84	16.38
SR (1993) n =73	7.37	19.85	132.52	19.01	9.90		31.70	127.67	26.29	
East SR (1999) n = 446	7	20.56	115.13	15.60	12.66		20.80	126.11	25.39	18.20
East SR (2007) n = 195	7	20.75	116.37	11.67	16.36		20.83	125.23	24.84	

Comparing the group of girls from Banská Bystrica to the group of girls from Slovakia (1993) shows to be in favor of the girls of Slovak population in three indicators: standing long jump, sit-ups and endurance shuttle run (Table 4). The girls from Banská Bystrica are better in flexed arm hang and in the indicator sit-and-reach are the same average values in both groups. Our girls are worse in trunk flexibility, dynamic and endurance strength of abdominal and hip-thigh muscles. They are better in the following tests: standing long jump, flexed arm hang and endurance shuttle run.

Referring to the explosive power of lower limbs and the results of Slovak population of boys and girls at the age of 7years, our groups lag behind as mentioned by Zapletalová (2002).

We have recorded significantly lower BMI of our groups of boys and girls to compare them with the group of children from eastern Slovakia, when comparing Slovakia group (1993) and east one (1999). However, recorded data are higher than national standards stated by Medeková-Šelingerová (2007) for Slovak children who do a sport and the one who do not.

Table 4 Comparison of average results of our group with other researches – girls

Girls	AGE	SRT	SLJ	SUT	FAH	4 x 10	ESR	HEIGHT	WEIGHT	BMI
x		(cm)	(cm)	(n)	(s)	(s)	(n)	(cm)	(kg)	(i)
BB (2013) n = 240	7.25	20.83	111.49	13.07	16	14.54	19.87	125.62	25.72	16.16
SR (1993) n =71	7.29	20.83	123.46	17.61	8.92		27.31	125.83	25.40	
East SR (1999) n = 452	7	21.65	108.73	14.59	10.12		18.91	125.02	24.82	18.91
East SR (2007) n = 195	7	21.68	104.69	13.12	11.50		17.93	124.77	24.11	

CONCLUSION

Seven year old boys achieve better level in five tests of general physical performance: standing long jump, sit-ups, flexed arm hang, shuttle run 4 x 10 and endurance shuttle run. In three of them there are statistically significant differences. The girls achieve statistically better level of trunk flexibility.

Referring to a general physical performance, the group of boys from Banská Bystrica lag behind the group of boys of Slovak population in all the tests, except the flexed arm hang test. The comparison of the boys from eastern Slovakia shows bigger equality of both groups.

What refers to a general physical performance, the group of girls from Banská Bystrica lag behind the group of girls of Slovak population in three tests, in one indicator they are at the same level and they are the best in one of them. The comparison of the girls from eastern Slovakia shows bigger equality of both groups, three times in favor of our group and two times in favor of the group of girls from eastern Slovakia.

Both our groups are significantly better in the flexed arm hang test when comparing them with a group of Slovak population and eastern Slovak population.

In indicators of physical development has been recorded statistically significant difference in body height and weight in favor of boys. Then, BMI of boys is also slightly higher but not statistically significant. In the comparison of the group from Slovakia (1993) and eastern Slovakia (1999), we recorded significantly lower BMI of our groups of boys and girls to compare it with the group of children from eastern Slovakia.

During the performance of all the tests for 7years old children, it is necessary to give the correct demonstration and to teach children basic forms of test implementation. Otherwise, at a low level of coordination abilities, the items are not sufficiently valid and their implementation is questionable.

Taking children's abilities into consideration, the flexed arm hang test and endurance shuttle run test are not valid enough, in which values of the standard deviation reach average values or more than half of the average.

REFERENCES

BROWN, J. 2001: Sports talent. Champaign : Human Kinetics, 2001.
CHYTRÁČKOVÁ, J. 2002. Unifitest. Praha : FTVS UK. 66 s.
EUROFIT: European Tests of Physical Fitness. 1988. Rome : Council of Europe, Comittee for the Development and Sport, 1988. 180 s.
MĚKOTA, K. – KOVÁŘ, R. et al. 1995. UNIFITTEST (6 – 60). Tests and Norms of Motor Performance and Physical Fitness in Youth and in Adult Age. Olomouc : Palacky University, 1995.
MORAVEC, R. – KAMMILLER, T. – SEDLÁČEK, J a kol. 2002. Eurofit. Telesný rozvoj a pohybová výkonnosť školskej populácie na Slovensku. Bratislava : SVSTVŠ, 1996. 181 s.
RUŽBARSKÁ, I. – TUREK, M. 2007. Kondičné a koordinačné schopnosti v motorike detí predškolského a mladšieho školského veku. Prešov : Fakulta športu PU, 2007. 142 s.
ŠIMONEK, J. 2012. Testy pohybových schopností. Nitra : Dominant, 2012. 195 s.
TUREK, M. 1996. Application of „EUROFIT" Tests of Younger School Age Pupils. I: Conference Proceedings 4 th International Scientific Conference „Sport Kinetics 95". Prague : Charles University, 1996, pp. 479 – 483.
TUREK, M. 1999. Telesný vývin a pohybová výkonnosť detí mladšieho školského veku. Prešov : SVSTVŠ, 1999. 112 s.
ZAPLETALOVÁ, L. 2002. Ontogenéza motorickej výkonnosti 7 – 18 ročných chlapcov a dievčat Slovenskej republiky. Bratislava: SVSTVŠ, 2002. 96 s.