

THE DEVELOPMENT OF STUDENTS' PHYSICAL ABILITIES IN THE FIRST DEGREE OF PRIMARY SCHOOL BY THE INTERVENTIONAL PROGRAM BUBO

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Abstract

This paper presents influence of interventional program BUBO on developing of chosen physical abilities of students at first degree on primary school. The object of research represented students of first degree on intentionally chosen primary schools where the interventional program BUBO was applied. The paperwork analyses differences in level of physical abilities of students based on application of interventional program BUBO in Physical Education for 20 minutes per lesson in average. We have statistically confirmed improvements in tests 20 m Shuttle Run Endurance, Shuttle Run 4 x 10 m, Sit-Ups In 30 Seconds in the whole group. In the test Standing Broad Jump improved statistically significantly only boys. Interesting is the fact that the probands worsened in the test Sit-and-Reach, although without statistical significance. We recommend continuing in application of interventional program BUBO in Physical Education, but we propose to incorporate more exercises for developing flexibility which should be consistently applied.

Keywords: Physical Education, Primary School, Interventional program

Introduction

A healthy lifestyle – slogan that we currently meet across the whole age range of the population. Today's technical environment has an impact on the lifestyle across the all age groups of the population. Maybe this is the cause of the fact, that young people gradually lose interest in the physical activity. With the increasing age of children, time spent by physical activities is reducing. We agree with the opinion of the authors of the Soos et al. (2010) and Novotna et al. (2009) that the current way of life for the majority

of children is characterized by a sedentary way of life and a deficit of physical activities in a daily routine appears as one of the most serious health risk factors. Such lifestyle changes children to physically incapable and they are not aware of how important it is to care about their bodies. As a result of a lack of physical activity, the number of obese children increases in all industrialized countries. According to the research by Ganley & Sherman (2000) up to 40% of obese children (Morrow et al., (2005) state of up to 70-80% of infants), and 70% of obese adolescents become obese adults. Physical activity, health improvement, physical improvement, exercising and increasing of the athletic activity is important in order to ensure the harmonious growth of young people and also for the healthy lifestyle of the population which should lead to a lifetime of physical engagement. If the basic habit of a regular physical activity is rightly fixed, it will continue as long as possible. The bases are already set in the childhood and multiple authors point out the importance of physical development already at the first grade of primary schools (Moravec, 1996; Kasa, 1990; Novotna et al., 2009).

An important role in solving this problem is Physical Education in primary schools. It is interesting that students in the primary education spend 286 minutes in school, of which only 19 minutes a day are spent on the physical activity. During Physical Education (2 lessons per week) students are in motion 23 minutes per lesson in average (Muzik et al., 2011). Adamcak (2007) points out the decreasing level of endurance ability of students in the pre-school age. Nowadays, new interventional programs focused on increasing the level of physical capabilities are invented, and a number of authors study their impact and effectiveness (Eather et al., 2013, van Beurden et al., 2003, Gajdosova & Kostalová, 2006, Jonasova & Michalkova & Muzik, 2006, Krska & Hubinak & Novotna, 2010). In this post, we see the interventional program BUBO as the aid for the development of the selected physical abilities of children in the first degree of primary school.

Methodology

We have implemented the interventional program BUBO to the lessons of Physical Education during the 7 month research. During the Physical Education lessons the students were practicing individual exercises of the program within the scope of an average 20 minutes per lesson. Input tests were done on 6. 11. 2013 and output tests on 19. 5. 2014. During the tests the same terms and conditions have been complied. By using somatometry, we have received somatic parameters at the beginning and at the end (body height, body mass). We have obtained a written agreement from the parents before the testing. We were evaluating the physical ability of children by using the test battery EUROFIT that is designed for the

assessment of medical fitness in relation to fitness for children and adults. EUROFIT for children is designed to be practical and applicable under conditions available in ordinary communities. Participating children completed a six-item test battery that measured Explosive Strength, Static Strength, Stamina and Flexibility.

Stamina was measured using the 20 m Endurance Shuttle Run test. The test began at a slow running pace (8 km/h) and ended when the subject could no longer sustain the pace. Children ran a 20 m distance, there and back continuously (one-foot touching the end-line) in accordance with a pace dictated by a sound signal. The running speed was increased every 1 min by 0.5 km/h. The subject should be required to stop if on two consecutive laps proband failed to reach a line 1 m from the end of the course or felt undue distress. The length of test was recorded as a lap. For Sit-And-Reach a child was recommended to sit keeping his/her knees straight and reach forward as far as possible from a seated position. The score was determined by the farthest position the child reached on scale with his/her fingertips. The Eurofit manual suggests having 15cm at the level of the feet. Standing Long Jump - The measurement is taken from take-off line to the nearest point of contact on the landing (back of the heels). Record the longest distance jumped, the best of two attempts. For endurance, a Bent Arm Hang and Sit-Ups In 30 seconds test were used in order to measure muscle endurance. The Bent Arm Hang test required maintaining a bent arm position while hanging from a bar. A round horizontal bar, diameter 2.5 cm, was set so that the child, when standing below it, can reach it without jumping. The child stood under the bar with hands in a forward grip on the bar at shoulder width. The time was started the moment the child's chin went above the bar and was let go. Running velocity was tested by Shuttle Run 4x10 m. The test item score is the time required to run 4x10 m (measured in seconds).

Mean values and standard deviation were calculated for physical features, body composition and physical abilities. Statistical differences were determined using two-tailed t-test. Comparison was considered significant at a P-value of 0.05 or less. We used box-plots for illustration of minimal value (Q0), maximal value (Q4), interquartile range (Q3-Q1) and mean value (X).

In this research, we were monitoring 50 children from the first grade of the primary schools - 23 girls (6.98±0.45 years old) and 27 boys (6.86±0.46 years old).

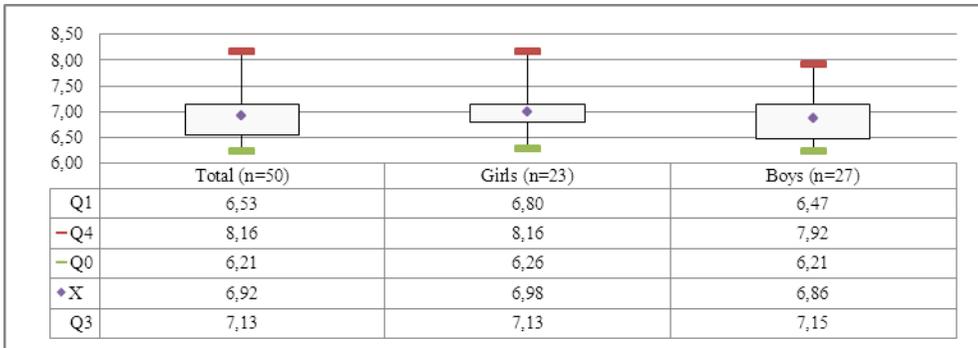


Figure 1 Decimal age

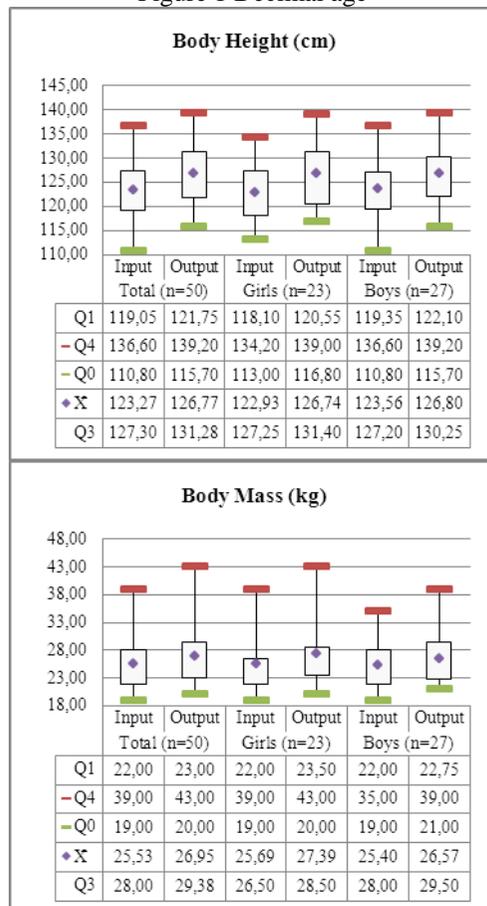


Figure 2 Body Height (cm) and Body Mass (kg)

Average body height of boys was 123.56 cm (SD= 6.33), with the body mass 25.4 kg (SD= 4.38). Input Body Mass Index was 16.59 (SD= 2.30). They grew by the average 3.24 cm for the 7 months (P-value<0.01).

Average body height of girls was 122.93 cm (SD= 5.52) and during the research they grew by the average 3.81 cm (P-value<0.01).

BMI of the boys at the beginning was 16.58 (SD= 2.30) and during the output testing measured result was 16.43 (SD= 2.01).

BMI of the girls was higher during the both testing times: Input BMI 16.92 (SD=2.90) and Output BMI 16.98 (SD= 3.15).

The interventional program BUBO was implemented in the research with the grant of 2 Physical Education lessons per week.

Exercises of the program were introduced to the Physical Education in the range of approximately 20 minutes, in the beginning and final part of the lesson. The main aim of the program is based on the dominant idea - a playful way for children to develop coordination, fitness ability not only through the athletic and gymnastic exercises, but also through the ball games. The application of physical program in the school praxis requires regularity, respectability and tendency of training.

During the lessons, we were developing physical ability (strength, endurance), conditional-coordination ability (speed, mobility) and coordination capabilities by various exercises, games and competitions, and we often used a combination of several abilities.

For the BUBO exercising we used various tools: cones, sticks, hoops, steppers, agility ladder, barriers and balls.

Results

During observation of influence of interventional program BUBO we found out differences between the input and output testing of tested units.

We were evaluating the achieved results of the research not only as a whole, but individually both sexes. Results of the tests are shown in the box-plot (Figure 3-8).

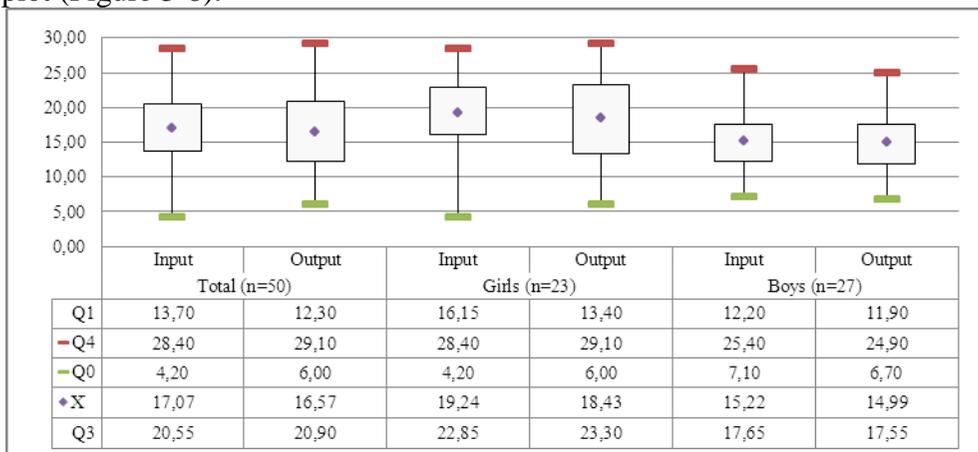


Figure 3 Sit-And-Reach (cm)

The girls in comparison to boys did better in the input (Mean = 19.24 cm, SD = 5.49) and also in the output testing (Mean = 18.43 cm, SD = 6.16).

During the testing they have worsened by 0.81 cm without statistical significance.

Boys have achieved average results in the input testing 15.22 cm (SD = 4.97) and in the output testing 14.99 cm (SD = 5.05). The difference was 0.23 cm without statistical significance.

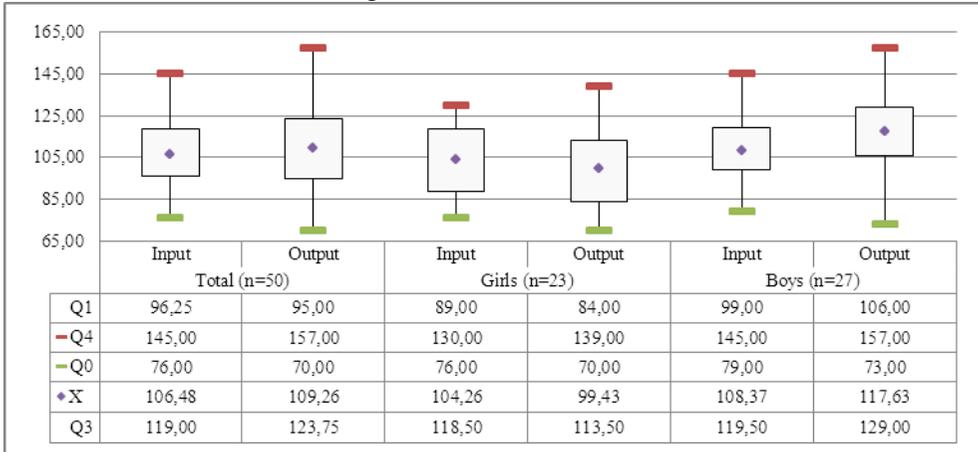


Figure 4 Standing Broad Jump (cm)

Girls have achieved in the input testing an average value of 104.26 cm (SD = 15.87). During the output testing they have worsened by 4.83 cm (Mean = 99.43 cm, SD = 20.06).

Boys, unlike girls have improved compared to the input performance of 108.37 cm (SD = 17.84) by 9.26 cm (P-value < 0.01) and they jumped 117.63 cm (SD = 19.32) in average.

In all, the group has improved by 3.78 cm, but the difference was not significant. An interesting fact is that during the testing: Standing Broad Jump, only boys have improved.

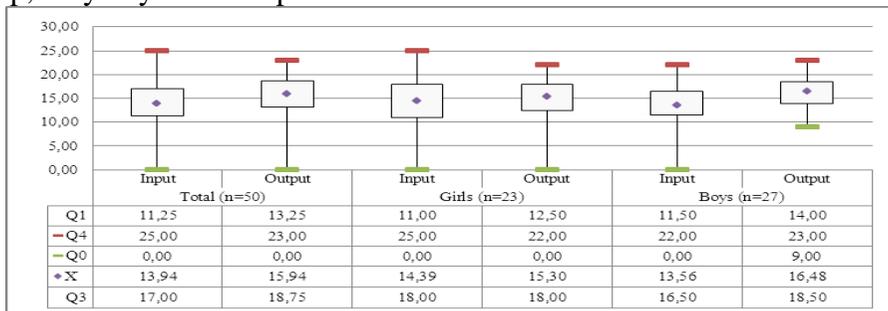


Figure 5 Sit-Ups In 30 Seconds (n)

In the test Sit-Ups In 30 seconds, we noted in the input testing minimum results for both sexes. Interesting is the fact, that 1 boy and 2 girls were not able to do a single Sit-Up (1 girl not even during the output testing).

The girls have achieved performances: Input (Mean= 14.39, SD= 6.26) and Output (Mean = 15.30, SD = 4.55), which means that they have improved by 0.91 repeats without the statistical significance.

The boys have improved by an average 2.92 repeats (P-value<0.05). Group has improved by 2 repeats (P-value <0.05).

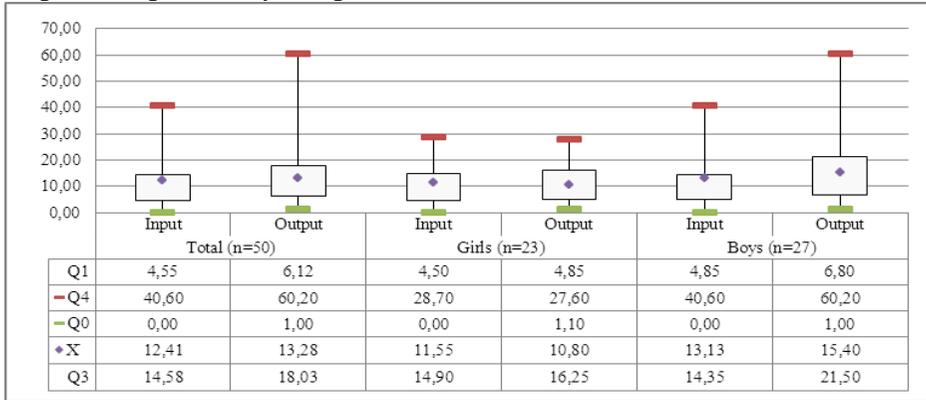


Figure 6 Bent Arm Hang (s)

In the test Bent Arm Hang the group has improved by 0.87 seconds in average. Again as in the previous test, two boys and two girls did not handle to hold on not even for one second.

Boys have reached 13.13 s (SD = 11.47) in average during the input testing and have improved by 2.27 s (Mean = 15.40 s, SD = 13.49) during the output testing. The best performance 60.2 s was reached by the boy during the output testing.

The average performance of girls during the input testing was 11.55 s (SD = 8.99) and during the output testing they have reached an average performance 10.80 s (SD = 7.32) which means they have worsened by 0.75 s.

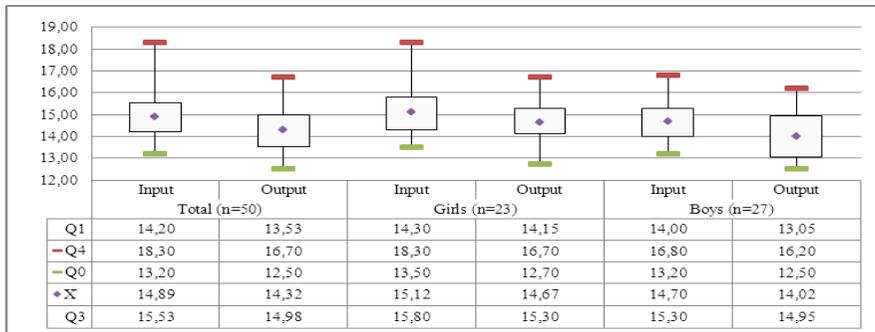


Figure 7 Shuttle Run 4 x 10 m (s)

We have obtained significant performance improvement in the test Shuttle Run 4 x 10 m. The group has improved by 0.67 s in average (P-value<0.01).

Girls have achieved an average time of 15.12 s (SD = 1.10) during the input testing. They have achieved a performance of 14.67 s (SD = 0.99) during the output testing with an improvement of 0.45 s (P-value<0.05).

The boys have improved compared with the input testing (Mean = 14.70 s, SD = 1.00) by 0.68 s (P-value<0.01) to the performance of 14.02 s (SD = 1.08) in the output testing.

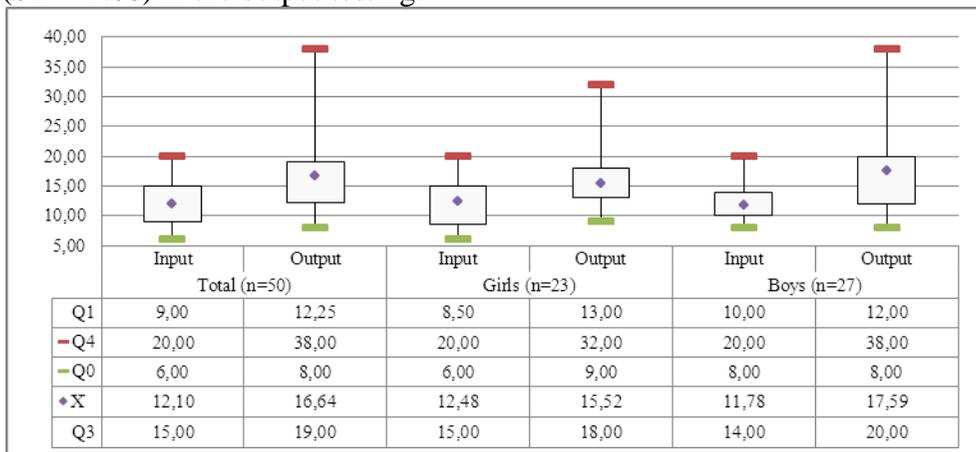


Figure 8 20 m Endurance Shuttle Run (laps)

During the 20 m Endurance Shuttle Run test the group has improved by 4.54 laps (P-value<0.01). Boys have achieved in the input testing an average performance of 11.78 laps (SD = 3.00), in the output testing 17.59 laps (SD = 7.47). They improved by 5.81 laps (P-value<0.01).

Girls have improved their performance by 3.04 laps (P-value<0.01) in comparison to the input test (Mean= 12,48 laps, SD= 4.04) and reached 15.52 laps (SD= 4.87) in average.

Conclusion

The results of the research analysis show that the interventional program BUBO, which was applied during the Physical Education lessons on our experimental group, had impact on certain physical abilities of tested units. Statistically, improvements were confirmed in the tests 20 m Endurance Run Shuttle, Shuttle Run 4 x 10 m and Sit-Ups In 30 Seconds in the whole group. In the test Standing Broad Jump only boys have significantly improved. Interesting is the fact that in the test Sit-and-Reach the tested units have worsened, although without statistical significance. It is visible that the exercises of interventional program have influenced primarily explosive power of the lower limbs. And on the contrary, stagnation or decrease was measured in the level of flexibility. We believe, that this effect was due to unfavorable developmental period of the tested units (Laczo, et. al., 2013), or it has not been given sufficient attention to stretching exercises

by the teachers during the Physical Education. Therefore, we propose to include in the interventional program BUBO more exercises on the development of the flexibility which have to be consistently applied.

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