

## The effect of goal-directed extracurricular physical activities on development of physical abilities in children of early school age

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### Abstract

**Background and Aim of Study:** A regular and organized physical activity performed in the leisure time of school children plays an important role in terms of their health and prevention. Health condition is reflected in the physical capability, viewed through children's general physical performance, which involves physical abilities. A partial outcome of the study shows the effect of goal-directed athletic activities, implemented by means of the Intervention Movement Programs run in leisure time as extracurricular physical education, designed to change the level of selected physical abilities of children of early school age. **Material and Methods:** The group consisted of 128 pupils (n=67 boys, n=61 girls) in age between 7 and 11 years. The Intervention Movement Programs involved assorted sets of basic, fitness, rhythmic gymnastics and dance, practiced for a period of 19 weeks, 2 times a week in a 60-minute class of extracurricular physical education, while at the same time the pupils took part 2 times a week in 2x 60 min. classes of standard PE, which also involved physical activities. The data was collected by means of standardized PE tests, focusing on the particular monitored factors of physical abilities. **Results:** Using the statistical evaluation, we were able to validate the effect of goal-directed physical activities on significant changes ( $p < 0.05$ ) in the level of the following monitored locomotive abilities by implementing the movement programs: In the group of seven-year-old boys: explosive strength capacity in the lower limbs; dynamic muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed; joint mobility and running endurance. In the group of seven-year-old girls: explosive strength capacity in the lower limbs; dynamic muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed and joint mobility. In the group of eight-year-old boys and girls: explosive strength capacity in the lower limbs; explosive strength capacity in the upper limbs and upper-body; dynamic muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed; joint mobility and running endurance. In the group of 10-11-year-old boys and girls: explosive strength capacity in the lower limbs; strength and endurance of abdominal lumbar and thigh muscles, joint mobility and running endurance. **Conclusions:** Regular and organized locomotive activity performed by children in their leisure time at school takes a significant share in development of physical abilities of the pupils in the monitored group. They form the basis of physical capability as a sign of health and building of healthy lifestyle in adult hood.

**Key Words:** early school-age, physical activities, physical abilities, leisure time PE, pupil

### Introduction

In the previous three decades we have seen a worldwide decline of physical activity among children and young people, which had an impact on their health (Soos et al., 2010; Maslyak, et al., 2014; Bala, 2015; Nemček, 2016; Aghyppo, et al., 2016; Wafa et al., 2016; Kuzmenko, 2017). The criteria of the WHO (2010) defining the minimum of daily activity are scarcely achieved by 25 % of children and youth (Tremblay et al., 2016). The situation in Slovakia is far from being different. The Ministry of Education of the Slovak Republic points out the fact that up to 70 % of school children and young people spend every day 4 hours of their free time by sitting in front of computers, working on the internet, watching TV or playing with their smartphones. "Only one in three pupils pursue a structured or organized athletic activity," warns the Ministry.

The present time world wide Covid-19 pandemic even increased the amount of time which the school children's population spends on sedentary activities. As a result, we can see the worldwide effort to endorse any health-improving, whole some physical activities in the entire population in order to prevent the chronic non-communicable diseases (Fyodorov & Erlikh, 2016). All countries of the European Union are urged to form their own national recommendations for their population based on the standards of athletic or physical activities reflecting the global WHO (2010) recommendations. The number of EU countries having their own national recommendations for physical activity has risen significantly. While in 2011 there were 16 countries with such programs, in 2018 their number grew to 23. There has also been a growth in number of countries, including Slovakia, which are applying country wide recommendations to children's physical activity.

Nevertheless, this process also requires a change in the current lifestyle of children and youth. It should show symptoms of activeness of movement, because physical activity as a part of human lifestyle, including the physical work and sports, is one of the basic attributes of human life (Nemček & Ladecká, 2020). It improves physical condition and health condition, reduces the risk of emergence of civilizational diseases, and it is one of the factors extending the human lifespan.

The above stated facts imply the importance of building the awareness of school children with respect to their own health and their personal responsibility for their health. It is also important to search for preventive measures which are to be taken to change their lifestyle. In this respect schools may play an important role not only by teaching Physical Education and sports as a curricular subject, but also in its extracurricular form as an optional Leisure Time PE (Perlman, 2014; Bendíková, 2016; Smoleňáková & Bendíková, 2017; Cardon et al., 2000). Health, the quality of life, the lifestyle and physical activities are becoming the more and more discussed topics with respect to actual subject of Physical education and sports, taught at elementary and secondary schools both in Slovakia and abroad (Kurková et al., 2015; Nagy et al., 2018; Bendíková, 2020). Supporting the development of physical capabilities due to health reasons is definitely preferred by Pate (2012). He explains, that preference of developing physical capability for health reasons is the primary condition determining daily practicing of movement activities, minimizing the risk of early development of civilization diseases as a benefit. In this regard, Bendíková (2017) points out the importance of development of physical abilities and gaining physical abilities which are important for improving pupils' physical condition, as well as their locomotive efficiency (Chovanová, 2018). School children's extracurricular physical activity is an important element of their free time activities. Physical Education as a school subject comprises a set of motional activities designed to provide for optimal development of physical abilities which help pupils of various age groups master locomotive activities (Vedernikova et al., 2019).

The optional (not compulsory) subject of Extracurricular Sports and Games (literally "*Movement Games and Athletic Preparation*") is the fundamental segment of extracurricular physical education in Slovakia. Any extracurricular activity in Slovakia can since 2004 be paid using the so-called Educational Vouchers, in accordance with Section 7 par. 8 of the Act No. 597/2003 coll. on Financing Elementary Schools, Secondary Schools and Educational Institutions, as amended. Extracurricular physical education is characterized by the benefits of physical activity (physical and psychical relaxation, health, physical fitness, improved function of immunity system, prevention of obesity and civilizational disease...) (Bendíková, 2012, 2017), rather than maximal athletic performance. It provides for an optimal range (amount, intensity, frequency, structure) of exercises for various age categories, extent of which is properly supplemented by the curricular Physical Education and Sport.

In this respect we should not forget that extracurricular physical activity performs the basic formative and informative function, being implemented continuously in by the teacher of physical education who tries to convince the pupils of the importance and effect of regular athletic activities on their health and their healthy lifestyle (Bendíková, 2012). This is why we can assume that it is inevitable to provide for sufficient athletic activity of children and for laying the foundation of their permanent interest in movement, selecting interesting and colourful media of physical education.

The aim of this study was to identify the effect of the goal-directed physical activities by means of Intervention Movement Programs as part of extracurricular physical education, focusing on changes in the level of selected physical abilities of pupils of early school age.

## Material and Methods

### Participants

In accordance with the goal and extent of the processed material, the group included on the whole  $\Sigma n=128$  pupils ( $n=67$  boys,  $n=61$  girls) of the town of Trenčín, aged 7-11 years, i.e., pupils of early school age, willing to participate in research, with the consent of their parents' takers and of the school. Pupils were divided into two groups: first group was formed by the 7- to 9-year-old, the second by the 10- to 11-year-old pupils. Throughout the research the pupils did not take part in any other leisure athletic activity. They had neither done any sport, nor were members of a sports club. The primary characteristic of the groups is presented in Tables 1 and 2.

**Table 1. The basics characteristics of boys research group**

| Measured values       | Research group (n=67) |           |           |           |           |
|-----------------------|-----------------------|-----------|-----------|-----------|-----------|
|                       | 7 age                 | 8 age     | 9 age     | 10 age    | 11 age    |
| Age/years             | 7±0.46                | 8±0.48    | 9±0.42    | 10±0.46   | 11±0.45   |
| Body weight/kg        | 26.1±7.1 kg           | 29.9±5.2  | 39.5±8.8  | 35.2±11.8 | 39.9±2.9  |
| Body height/cm        | 128.6±5.2             | 132.6±4.9 | 139.8±4.7 | 147.1±4.4 | 155.1±3.7 |
| BMI kg/m <sup>2</sup> | 16.3±3.9              | 16.9±2.4  | 20.1±3.9  | 16.9±3.9  | 16.5±1.7  |

kg - kilogram, cm - centimeter, BMI - Body mass index, kg/ m<sup>2</sup>-kilogram per square meter

**Table 2. The basics characteristics of girls research group**

| Measured values       | Research group (n=61) |           |           |           |           |
|-----------------------|-----------------------|-----------|-----------|-----------|-----------|
|                       | 7 age                 | 8 age     | 9 age     | 10 age    | 11 age    |
| Age/ years            | 7±0.43                | 8±0.41    | 9±0.43    | 10±0.47   | 11±0.43   |
| Body weight/kg        | 24.6±4.6 kg           | 32.3±5.1  | 34.1±5.1  | 35.2±11.8 | 39.8±2.8  |
| Body height/cm        | 127.4±6.7             | 137.6±6.1 | 142.8±5.2 | 145.1±4.5 | 155.2±3.8 |
| BMI kg/m <sup>2</sup> | 15.3±1.9              | 17.1±2.3  | 16.1±3.9  | 16.7±3.8  | 16.9±1.8  |

kg - kilogram, cm - centimeter, BMI - Body mass index, kg/ m<sup>2</sup>-kilogram per square meter

#### Measurement Organization

The research was running in several consequent phases, based on the partial goal of the research. The first phase was focused on organization of research, input measurements ( $V_1$ ) of somatometric indicators and testing of selected physical abilities using standardized tests based on usual practice of Physical Education. Second phase was the actual implementation of movement programs. Pupils attended the non-compulsory extracurricular subject of Physical Education - Sports and Games (literally "*Movement Games and Physical Preparation*"), held after the end of curricular classes. The first group of pupils (the 7- to 9-year-old pupils) attended the classes on Mondays and Wednesdays, and the second group (the 10- to 11-year-olds pupils) on Tuesdays and Thursdays. The classes were taught by a teacher who had studied Physical Education as her specialization subject and had worked as a teacher for 17 years. The Movement Intervention Programs (Table 3) included selected resources of basic, condition-aimed and rhythmic gymnastics and dance, which were carried out twice a week á 60 minutes, hence 120 minutes a week, throughout the period of 19 weeks, in total in 38 lessons. Each lesson included a 10-minute Warm-up, the 45-minute Main Part and a 5-minute Cool-Down. Third phase ( $V_2$ ) was focused on the output measurements of somatometric indicators and testing of selected physical abilities.

**Table 3. Movement program plan for 1 month (sample)**

| Lesson | Warm-up<br>(10min.) | Main Part (45 min.)  |                               | Cool down<br>(5min.) |
|--------|---------------------|----------------------|-------------------------------|----------------------|
|        |                     | A part               | B part                        |                      |
| 1      | Warm-up             | Rope skipping        | Dance                         | stretching           |
| 2      | Warm-up             | Aerobic              | Dance games                   | stretching           |
| 3      | Warm-up             | Stability ball       | Dance                         | stretching           |
| 4      | Warm-up             | Acrobatics           | Zumba                         | stretching           |
| 5      | Warm-up             | Over ball            | Skiping Rope games            | stretching           |
| 6      | Warm-up             | Exercise on the ribs | Dance                         | stretching           |
| 7      | Warm-up             | Exercise on benches  | Dance games                   | stretching           |
| 8      | Warm-up             | Aerobic              | Exercises on a balance device | stretching           |
| Σ      | 80min.              | 360 min/month        |                               | 45 min.              |

#### Measurement Taking

With respect to ascertainment of basic information about body height and body weight, we used the standard method of somatometry, and subsequently calculated the BMI index (Sedláček & Cihová, 2009). To ascertain the condition of selected physical abilities as a demonstration of general physical performance, we used motoric tests, which do not require a demanding material equipment, they can be implemented in the gym and are suitable for children of early school age:

- 1) Standing long jump: monitored factor: explosive strength capacity in the lower limbs (Moravec et al., 1996),
- 2) Sit ups: monitored factor: dynamic muscular strength and endurance of abdominal lumbar and thigh muscles (Moravec et al., 1996),
- 3) Throwing the solid ball: monitored factor: explosive strength capacity in the upper limbs and upper body (Sedláček & Cihová, 2009),
- 4) 20 metres run: monitored factor: acceleration speed (Sedláček & Cihová, 2009),
- 5) Seated Forward bend with reaching feet: monitored factor: joint mobility (Moravec et al., 1996),
- 6) Endurance shuttle run: monitored factor: running endurance (Moravec et al., 1996).

#### Data Analyses

We used mathematical and statistical methods to process the collected data and to calculate basic descriptive statistics: arithmetical mean ( $\bar{x}$ ), minimum (min.), maximum (max.) and selective standard deviation (SD). In order to ascertain statistical significance of achieved results in the level of physical abilities, we used the paired t Test ( $p < 0.05$ ). In order to process and evaluate the data, we also used logical methods (analysis, synthesis, comparison). Acquired data was also processed in charts. We evaluated the processed data, previously collected in testing of physical abilities of the monitored groups, individually for boys and girls with respect to their calendar age (7-years-old, 8- and 9-years-old and 10- and 11-years-old, boys and girls separately).

## Results

In this section we will present the results of the research in tables 4, 5 and 6, which cannot be generalized, but we can point out significant application of movement programs in practice.

We compared the acquired data of physical development (body weight, body height, BMI) of the monitored group with the reference standards Sedláček & Cihová (2009), finding out, that the age groups of 7-, 8-10-, 11-years-old children, 9-years-old girls fall into the average category of Slovak population. 9-years-old boys fall into the lower limit of over-standard physical development.

We noticed significant changes in the category of 7-years-old boys after application of the Intervention Movement Programs ( $p < 0.05$ ) and evaluating the test results of long jump, sit-ups in 30 s., 20-metre run, seated forward bend with reaching feet and endurance shuttle run. In spite of some improvement in changes of results in the test of Throwing the solid ball, the statistical significance could not be confirmed (Table 4). We noticed statistically significant changes of differences between the input and output diagnostics of girls in following tests: Standing long jump, Sit-ups, 20-metre run, and seated forward bend with reaching feet ( $p < 0.05$ ). In spite of improvement, the achieved average difference in the test of Endurance shuttle run cannot be considered significant. Evaluating the effects of Movement Program on boys and girls, we ascertained more distinct effect in favour of boys in the group of the 7-years-old children, which was manifested by a significant change ( $p < 0.05$ ) in 5 monitored items (1,3,4,5,6), while in the girls' group in 4 tests (1,3,4,5). Development of explosive strength capacity in the upper limbs and upper body requires a longer-term and more intense effect on both sex groups. The increase of running endurance in girls' group probably requires a longer period exposure period than in boys' group.

**Table 4. Evaluation of changes at the level of the 7-years-old pupils**

| Gender<br>Test | Boys     |          |            |       | Girls     |           |            |       |
|----------------|----------|----------|------------|-------|-----------|-----------|------------|-------|
|                | $V_1(x)$ | $V_2(x)$ | $t_{test}$ | p     | $V_1(x)$  | $V_2(x)$  | $t_{test}$ | p     |
| 1.             | 105±14   | 118±20   | 0.0038*    | <0.05 | 106±22    | 121±17    | 0.0151*    | <0.05 |
| 2.             | 209±41   | 228±42   | 0.0515     | >0.05 | 220±61    | 227±59    | 0.1834     | >0.05 |
| 3.             | 13±5     | 16±5     | 0.0111*    | <0.05 | 16±6      | 19±5      | 0.0322*    | <0.05 |
| 4.             | 5.09±0.7 | 4.69±0.6 | 0.0039*    | <0.05 | 5.13±0.44 | 5.09±0.39 | 0.0401*    | <0.05 |
| 5.             | 17±18    | 18±18    | 0.0259*    | <0.05 | 20±7      | 22±7      | 0.0418*    | >0.05 |
| 6.             | 19±8     | 21±10    | 0.0053*    | <0.05 | 16±6      | 17±5      | 0.4798     | >0.05 |

$p < 0.05$  –statistically significant on the level of 5 %, 1.- Standing long jump(cm), 2.- Throwing the solid ball (cm), 3.- Sit ups (n), 4.- 20 metres run (s), 5.- Seated Forward bend with reaching feet (cm), 6.- Endurance shuttle run (n), x - arithmetical mean (x),  $V_1$  - input,  $V_2$  - output

We were really satisfied with the results achieved in the group of 8- and 9-years-old boys [Table 5], where there were significant changes ( $p < 0.05$ ) in all monitored physical abilities due to the Intervention Movement Program. Equally, the 8- to 9-years-old girls achieved positive changes in the development of selected physical abilities due to the intervention, and so we can conclude that in all tested items (1. – 6.) there have been also significant changes ( $p < 0.05$ ).

**Table 5. Evaluation of changes at the level of the 8-and 9- years-old pupils**

| Gender<br>Test | Boys     |          |            |       | Girls     |           |            |       |
|----------------|----------|----------|------------|-------|-----------|-----------|------------|-------|
|                | $V_1(x)$ | $V_2(x)$ | $t_{test}$ | p     | $V_1(x)$  | $V_2(x)$  | $t_{test}$ | p     |
| 1.             | 125±14   | 134±20   | 0.0118*    | <0.05 | 115±19    | 132±15    | 0.0000*    | <0.05 |
| 2.             | 284±30   | 307±51   | 0.0301*    | <0.05 | 306±56    | 324±57    | 0.0058*    | <0.05 |
| 3.             | 20±6     | 21±5     | 0.0343*    | <0.05 | 20±3      | 24±4      | 0.0000*    | <0.05 |
| 4.             | 4.93±0.7 | 4.74±0.6 | 0.0221*    | <0.05 | 4.65±0.44 | 4.54±0.43 | 0.0321*    | <0.05 |
| 5.             | 18±10    | 20±9     | 0.0269*    | <0.05 | 15±6      | 20±5      | 0.0000*    | <0.05 |
| 6.             | 21±8     | 22±9     | 0.0359*    | <0.05 | 20±5      | 21±6      | 0.0001*    | <0.05 |

$p < 0.05$  –statistically significant on the level of 5 %, 1.- Standing long jump(cm), 2.- Throwing the solid ball (cm), 3.- Sit ups (n), 4.- 20 metres run (s), 5.- Seated Forward bend with reaching feet (cm), 6.- Endurance shuttle run (n), x - arithmetical mean (x),  $V_1$  - input,  $V_2$  - output

The last group consisted of 10- and 11-years-old children whose results are listed in Table 6. Due to the effects of experimental factor, we noticed in the boys' group statistically significant changes in motoric tests of long jump, sit-ups, seated forward bend with reaching feet and endurance shuttle run, confirmed also in the t Test ( $p < 0.05$ ). We must also admit that the tests of throwing the solid ball and 20-metres run did not confirm significant changes of level, as we have not noticed bigger difference in values, which is also confirmed by the

major standard deviation. When compared with boys, girls in the age between 10 and 11 years achieved significant changes in identical tests of standing long jump, sit-ups, seated forward bend with reaching feet and also in endurance shuttle run. Due to the above results, we can conclude equal effect of the Intervention Movement Program on 10- and 11-years-old boys and girls.

**Table 6. Evaluation of changes at the level of the 10- and 11- years-old pupils**

| Gender<br>Test | Boys     |           |            |       | Girls     |           |            |       |
|----------------|----------|-----------|------------|-------|-----------|-----------|------------|-------|
|                | $V_1(x)$ | $V_2(x)$  | $t_{test}$ | p     | $V_1(x)$  | $V_2(x)$  | $t_{test}$ | p     |
| 1.             | 154±15   | 165 ±26   | 0.0359*    | <0.05 | 145±13    | 159±8     | 0.0020*    | <0.05 |
| 2.             | 402 ±127 | 411 ±130  | 0.2711     | >0.05 | 361±89    | 369±86    | 0.1872     | >0.05 |
| 3.             | 21±6     | 27 ±6     | 0.0012*    | <0.05 | 22±5      | 26±3      | 0.0070*    | <0.05 |
| 4.             | 4.25±0.6 | 4.06 ±0.6 | 0.3301     | >0.05 | 4.46±0.22 | 4.28±0.32 | 0.2422     | >0.05 |
| 5.             | 16±5     | 19 ±5     | 0.0360*    | <0.05 | 17±2      | 21±3      | 0.0211*    | <0.05 |
| 6.             | 25±9     | 27±8      | 0.0243*    | <0.05 | 27±8      | 30±3      | 0.0000*    | <0.05 |

p<0.05 –statistically significant on the level of 5 %, 1.- Standing long jump (cm), 2.- Throwing the solid ball (cm), 3.- Sit ups (n), 4.- 20 metres run (s), 5.- Seated Forward bend with reaching feet (cm), 6.- Endurance shuttle run (n), x - arithmetical mean (x),  $V_1$  - input,  $V_2$ - output

### Discussion

Physical activity of children is inevitable for keeping them both physically and mentally fit. In spite of that, the research (Krivolapchuk & Chernova, 2018) shows its deficit. Based on this fact, we tried to contribute to increase in physical activity of children of younger school age by means of an interesting and colourful scale of physical activities. We used the instruments of basic, fitness, rhythmic gymnastics and dance. At the same time we were trying to influence development of physical abilities, and thus contribute to improvement of children's health. On the basis of here presented research, we can conclude that our Intervention Movement Program had significant effect (p<0.05) on development of the following abilities:

1. Explosive strength capacity in the lower limbs in the entire research array/group;
2. Explosive strength capacity in the upper limbs and upper-body only in the group of 8-to 9-years-old boys and girls;
3. Dynamic muscular strength and endurance of abdominal lumbar and thigh muscles in the entire research group;
4. Acceleration speed in the group of 8-to 9-years-old children;
5. Joint mobility in the entire research group;
6. Running endurance in the entire research group except for 7-years-old girls.

In comparison with the reference standards defined by Sedláček & Cihová (2009), the average level values of particular physical abilities can be added to score points of a 10-degree scale of the standardized tests we accomplished, except for the 20-metres run, which is pointed out in Table 7.

**Table 7. Average evaluation by assigning points according to standard Sedláček & Cihová (2009)**

| Age<br>Test | 7-years-old    |       |                |       | 8-9-years-old  |       |                |       | 10-11-years-old |       |                |       |
|-------------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|-----------------|-------|----------------|-------|
|             | $V_1$ (points) |       | $V_2$ (points) |       | $V_1$ (points) |       | $V_2$ (points) |       | $V_1$ (points)  |       | $V_2$ (points) |       |
|             | boys           | girls | boys           | girls | boys           | girls | boys           | girls | boys            | girls | boys           | girls |
| 1.          | 2              | 4     | 3              | 5     | 2              | 3     | 3              | 5     | 6               | 5     | 7              | 6     |
| 2.          | 4              | 6     | 5              | 6     | 5              | 7     | 6              | 8     | 6               | 6     | 6              | 6     |
| 3.          | 4              | 5     | 5              | 6     | 6              | 6     | 6              | 7     | 5               | 6     | 6              | 7     |
| 5.          | 5              | 5     | 5              | 6     | 5              | 4     | 6              | 5     | 4               | 4     | 5              | 5     |
| 6.          | 3              | 4     | 3              | 3     | 3              | 3     | 4              | 4     | 3               | 3     | 3              | 4     |

1.- Standing long jump, 2.- Throwing the solid ball, 3.- Sit ups, 4.- 20 metres run, 5.- Seated Forward bend with reaching feet, 6.- Endurance shuttle run,  $V_1$  - input,  $V_2$ - output

The results listed above imply that our research group showed mostly average level of monitored physical abilities in endurance and explosive strength capacity of the lower limbs in the boys' group. We also noticed that girls – according to the norm – achieved higher rating for testing of physical abilities, which may be caused by faster physical development in this period and due to their natural interest in the offered physical activity in term of intersexual differences. As the proposed Intervention Program does not require any demanding equipment, we would recommend schools to use extracurricular leisure time for practicing the above listed physical activities for pupils, as it is also recommended by many studies presenting the advantages of using all opportunities schools may get for practicing physical activities (Sarkin et al., 1997; Wechsler et al., 2000; Jago & Baranowski, 2004; Rooney & McKee, 2018; Volmut & Šimunič, 2021), or education of pupils guiding to a healthy lifestyle (Smoleňáková & Bendíková, 2017; Fyodorov et al., 2019). We can conclude that

children in the research group, led by the team of professionals, spent their free time twice a week by a goal-directed physical activity and thus contributed to development of the monitored physical abilities, which has a positive effect on their health and strengthens their positive motivation to develop an active lifestyle. We can identify ourselves with the recommendations of physical activity, formulated by experts in the USA (Corbin & Pangrazi, 2003) or in the UK (Biddle et al., 1998), who have set the minimum recommended time of daytime children's physical activity to at least 60 minutes a day in a moderate to intensive level of physical activity. The recommendations correspond to our goal – to contribute to all listed goals and at the same time keep open the opportunities for spontaneous activities of children outdoors. We can confirm that besides the active physical movement, the children showed throughout the experiment great interest in common activities in interaction with their peers. We can only agree with the study of Talaghi et al. (2019) that activities of this kind can, on top of other benefits, be used as a means of social integration and a device for education.

### Conclusion

The objective of the study was to ascertain the effect of goal-directed physical activity using the Intervention Movement Programs, implemented within extra-curricular classes of Physical education as a leisure time activity, with the intention of changing levels of particular physical activities of early school age pupils. On the basis of the statistical treatment of collected data we have confirmed the effect of the implemented Intervention Movement Programs on significant level changes ( $p < 0.05$ ) of monitored physical abilities:

In the group of 7-years-old boys: explosive strength capacity in the lower limbs; dynamic, endurance muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed; joint mobility and running endurance. In the group of 7-years-old girls: explosive strength capacity in the lower limbs; dynamic, endurance muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed and joint mobility. In the group of 8-years-old boys and girls: explosive strength capacity in the lower limbs; explosive strength capacity in the upper limbs and upper-body; dynamic, endurance muscular strength and endurance of abdominal lumbar and thigh muscles; acceleration speed; joint mobility and running endurance.

In the group of 10- to 11-years-old boys and girls: explosive strength capacity in the lower limbs; endurance muscular strength and endurance of abdominal lumbar and thigh muscles, joint mobility and running endurance. We can also confirm that the experimental factor positively affected the changes of explosive strength capacity in the upper limbs and upper-body and also of acceleration speed of the 10- to 11-years-old, but not significantly. On the basis of the above findings, we can the Intervention Movement Program, using assorted sets of basic, fitness, rhythmic gymnastics and dance, consider an appropriate means for practice, and we can recommend it. By applying the regular and long-lasting physical activity in the lives of children, in accordance with the newest recommendations of the WHO (2020), we can accomplish formation of proper movement habits and improve health of children, which is the common goal of the whole society.

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### Conflicts of interest

The authors declare no conflict of interest.

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