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BACK SCHOOL PROGRAM: DEVELOPMENT OF BACK CARE KNOWLEDGE AND SPINE DISEASE PREVENTION AND TRUNK STATE AMONG 6-7-YEAR-OLD CHILDREN

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ABSTRACT. Introduction: The prevalence of posture deformities and muscle weakness among primary school children is high (50-65%). **Objective:** To assess and improve the back care knowledge and spine disease prevention, the strength of the trunk muscles, the flexibility of the lower limb muscles, the posture, and the lumbar motor control ability of primary school children by a 1-school year back school program. **Methods:** 102 (mean age: 6.549±0.500 years) children were examined at the baseline, and 48 (23 boys, 25 girls) were chosen for the program. Back care knowledge was examined by validated questionnaire, trunk muscle strength, and muscle flexibility by Lehmann tests, posture by New York Posture Rating Chart, and lumbar motor control by Sitting Forward Lean Test. **Results:** The complete back care knowledge (2.423±3.911, 19.115±2.833 points; $p<0.001$), trunk flexor (3.615±7.910, 56.885±113.748 sec; $p<0.001$), trunk extensor (8.962±5.963, 77.000±139.801 sec; $p<0.001$) static muscle strength, lower limb flexibility ($p<0.001$), habitual posture (53.846±10.130, 81.154±9.829 points; $p<0.001$), posture deemed correct 40.962±16.311, 91.346±6.566 points; $p<0.001$) and lumbar motor control (8.269±5.474, 0.154±0.368 mm; $p<0.001$) significantly improved in the intervention group for the end of the program. **Conclusions:** The back school program improves the back care knowledge and the trunk state among 6-7 years old children.

Keywords: *primary school children, back school, back care knowledge and spine disease prevention, trunk state, lumbar motor control ability*

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Introduction

The back school programs develop specialized knowledge and skills in primary, secondary, and tertiary prevention in adults and children, healthy and ill (Szilágyi, 2019).

The purpose of back school programs is to apply "spine-friendly" forms of exercises at skill level (Szilágyi, 2019). The ability to use the spine correctly is the "automated component of conscious activity" (Zakarné, 2003), which is known through the knowledge and multiple application of spine protection rules, partial-, progressive-, isolation-, global-, applying- or processing practices, and analytical-, global - or it can be developed by the method of transferable learning (Zakarné, 2003; van Middelkoop, 2011).

The back school programs include anatomy, biomechanics, ergonomics education, and practice. Elements of patient education: develop the patient's sense of personal responsibility, the patient's ability to recognize adverse spine motions (Moseley, 2004; Ribeiro, 2008) and learn about one's own body, muscle tone through body sensation and body experience, perceive muscle activity types and evolve functionally biomechanically correct posture, recognize muscle balance, acquire spine-friendly lifestyle and apply at school, work, and leisure time.

Patient education includes disease-specific knowledge in the topic of body biomechanics, spinal anatomy, and ergonomics (Szilágyi, 2019), which is repeatedly asked in the form of tests measuring the effectiveness of education, with the help of back care knowledge questionnaires (Szilágyi, 2021; Monfort-P, 2016; Miñana-S, 2015). Practical classes teach the correct posture and the correct use of the spine, strengthen the muscles that support and maintain them and, if necessary, increase their flexibility by stretching exercises. Education also covers ergonomic work situations, spine-friendly leisure activities, resting postures, load-bearing and working techniques, and relaxation exercises. Back school programs support the teaching of spine-friendly lifestyles with biomechanical explanations and foundations that have proven to be more effective in therapeutic follow-up (Szilágyi, 2019; Lehmann, 2001; Kollmuß, 2001).

Back school programs are not standardized, there are many back school model variations. Child back school programs are available in many countries (USA, Germany, Belgium, Brazil, Poland, Spain, Turkey, Australia, Iran), in „class" groups (20-30 children/ group), with varied duration (3 weeks-1 year), frequency (1-2 occasion/week), time (30-90 minutes/ occasion) and follow-up (3 month-2 years). The effectiveness of back school programs is intensity and content dependent. In terms of intensity, short-term, short-time programs are less effective, than longer-term programs. There are a few complex back school programs that include theory and practice. On the personal lessons, participants receive mostly written materials providing theoretical and practical information. There are few child back school programs for children aged 6-7 years (Geldhof, 2007; Dolphens, 2011; Vieira, 2015; Ritter, 2015; Fonseca, 2015; Brzek, 2016; Santos, 2017; Miñana, 2019; Szilágyi, 2019).

Objectives

The study aimed to develop a 1-school year child back school program, and complex test system that measures the knowledge taught during the child back school program (spine anatomy, body biomechanics, ergonomics, rules of spine protection and utilization) and physical abilities and skills needed for the use of spine- friendly lifestyle (muscle balance, posture, lumbar motor control) for 6-7 years old primary school children.

Also, our goal was to develop, implement, and test the effectiveness of the long-term child back school program on the change of the developed and measured parameters.

Material and Methods

Study design

The study was conducted between 2016 and 2018, in Pécs, Hungary. The director of the schools provided a Declaration of Support. All the parents were informed about the process of the back school program and have provided written consent permitting their children to participate in the study. The parents were assured of the anonymity and confidentiality based on the Data Protection Act of Hungary. The study was approved by IRB of the Regional Research Committee of the Clinical Center, Pécs, Hungary (No.: 6125).

Participants

At the baseline examination, 102 (52 boys, 50 girls) primary school first-grader (6.549±0.500 years) children were tested. With not random sample selection, 26 children (11 boys, 15 girls) were chosen in the intervention group, who took part in the back school program. In the control group, 22 children (12 boys, 10 girls) were included, who did not participate in the back school program, they only took part in the regular physical education classes. Table 1 shows the mean values of the age, body height, body weight, and the body mass index (BMI) of the examined population.

Table 1. Mean values of the examined population

	The examined population (n=102)		**Intervention group (n=26)**				**Control group (n=22)**			
	mean pre	**SD**	**mean pre**	**SD**	**mean post**	**SD**	**mean pre**	**SD**	**mean post**	**SD**
Age (years)	6.549	0.500	6.577	0.504	7.308	0.679	6.591	0.503	7.318	0.716
Body height (cm)	126.549	5.140	126.558	5.013	130.654	7.322	126.500	5.198	131.364	6.433
Body weight (kg)	26.135	3.467	26.377	3.515	27.531	5.459	26.118	3.405	27.600	4.642
BMI (kg/m^2)	16.291	1.766	16.445	1.827	15.968	1.723	16.311	1.879	15.867	1.426

SD: standard deviation; BMI: body mass index; pre: baseline, before the program; post: after the program

Inclusion criteria: 6-7 years old primary age children.

Exclusion criteria: Congenital or acquired spinal cord disease, severe locomotor, internal or neurological illness, non- mature child for school, certified athletes, sports club members (Lehmann, 1998; Kollmuß, 2001; Szilágyi, 2019).

Data collection

Health Questionnaire on Back Care Knowledge and Spine Disease Prevention for Children

The questionnaire was filled out by the children before and after the back school program. We used a self-developed and validated questionnaire (Szilágyi, 2021). The questions have been read aloud for them and were illustrated by drawings, pictures, and figures. Five questions addressed the anatomical and biomechanical properties of the spine, three questions were about spine utilization and ergonomics.

Scoring

There are questions, with more correct answers, for every correct answer a point can be given, thus who can find all the correct answers a total of 7 points can be given for question 1, 2 points for question 2, 2 points for question 3, 3 points for question 4, 2 points for question 5, 1 point for question 6, and 1 point for question 7. For the wrong answer, 0 point was given. A maximum of 18 points can be obtained in the questionnaire and a minimum of 0 point. The total possible score was 21 points, for anatomical and biomechanical questions (1,2,5,7) 15 points, for spine use and ergonomical questions (3,4,6) 6 points could be awarded. Between 100-80%, the knowledge is appropriate, between 79-60% it needs to be developed, and between 59-0%, it is inappropriate.

Habitual posture and posture deemed correct with New York Posture Rating Chart

Three pictures were taken from the children, one from the back view and two from the side views. While taking the photo, children had to be barefooted, in tight fit or with the naked upper body; for girls, long hair had to be tied to avoid covering the neck and shoulders. Children were standing in front of a black background and behind a plumb line that almost reached the ground. From the back view, the plumb line had to go through the head, spine and had to end between the two legs in the middle. From the side view, the plumb line had to go through the ear, lumbar I. and V. vertebrae and the lateral ankle. Pictures were taken 3.048 m far from the student, with NIKON D3400 camera.

For showing habitual posture, we asked the children to stand in front of the screen, to show how they usually stand in everyday life.

For posture deemed correct, we asked the children to stand in front of the screen as they think it was correct (Kovácsné, 2016; McRoberts, 2013; The University of the State of New York, 1972).

Scoring

First, the New York Posture Rating Chart was published in 1958 (The University of the State of New York, 1972), then in 1992 Howley and Franks modified it, instead of 13 segments, 10 segments were examined and scored independently from each other by a qualified examiner. From the back view (frontal plane), head, shoulders, spine, hips, and legs were examined and scored. From the side view (sagittal plane) cervical, upper thoracic, and lower thoracic part (trunk), the abdominal part and lumbar part were examined and scored. Writing a short comment was allowed for each segment. According to the modified rating, 10 points meant correct posture, 5 points fair posture, and 0 point poor posture. The maximum score was 100 points for the correct posture of each segment (McRoberts, 2013).

Trunk muscle strength and lower limb flexibility with Lehmann test

Trunk flexor static muscle strength

Children are in supine lying on a mattress, the hips and knees are in 90° flexion at both lower limbs. Shoulders stay on the ground, upper limbs have an angle of 45° with the trunk, they are straight, lifted 3-5 cm from the ground, palms are looking upwards. The position of the head: stretch with the head, the face is looking to the ceiling, the chin doesn't approach the chest. The head is lifted 3 cm from the ground, beside the kept of the upper and lower limbs in the correct position, the lumbar part is pressed down to the ground and must be kept on the ground during the examination. We measure the time in seconds to maintain the correct posture during the examination. The examination is finished, in case of the lumbar part comes up from the ground, or the position of the lower, upper limbs change.

Scoring

Keeping the correct posture for 10 seconds means normal muscle strength for a 7-year-old child. Less than 10 seconds means not normal muscle strength for a 7-year-old child (Lehmann, 1998).

Trunk extensor static muscle strength

Children are in prone lying on a mattress, and the lower limbs are straight and in a little straddle, the foot leans on the floor, knees are on the floor. Upper limbs are at the level of the shoulder, and the elbow is in 90° flexion, the palms face each other, the fingers are straight, the thumb looks upwards. The head (nose-ground) is lifted 2 centimeters from the ground, and the upper limbs are lifted 5 centimeters from the ground. During the examination, we measure the time in seconds to maintain the correct posture. The examination is finished, in case of the position of the head, upper, and lower limbs change.

Scoring

Keeping the correct posture for 10 seconds means normal muscle strength for a 7-year-old child. Less than 10 seconds means not normal muscle strength for a 7-year-old child (Lehmann, 1998).

Hip flexor muscle flexibility

The child is sitting at the end of the treatment bed, embrace the left lower limb from below, slowly leaning back to supine, the left hip is in 90° flexion. The right lower limb is relaxed, and the knee is in 90° flexion. In this case, the right lower limb is tested. We perform the test on the other lower limb.

Scoring

The flexibility of the hip flexor is appropriate if the examined limb is on the table, the knee is in 90°, and the longitudinal axis of the femur points downwards (Lehmann, 1998).

Knee flexor muscle flexibility

The child is in supine, and both legs are on the floor. Arms are straightly beside the body. The right leg is straightly raised to 90° hip flexion, while the left leg is loosely on the ground. In this case, we examine the flexibility of the right knee flexor.

Scoring

The flexibility of the knee flexor is appropriate if the lifted lower limb beside extended knee reaches 90° flexion in the hip, and the lower limb (knee) on the ground does not lift off (Lehmann, 1998).

Lumbar motor control ability with Sitting Forward Lean test

The child is sitting on a treatment bed or chair, and the soles do not touch the ground, the knee bend touches the edge of the bed, the hip and knee are in 90° flexion, the spine, including the lumbar part, is in the neutral position. We help the child to have the correct posture. We sign the upper endplate of the first sacral vertebra and measure 7 centimeters upwards in the middle of the spine, that point is also signed. After the checkmarks, we ask the child to pull up the lower limbs after each other five times, equally raise up the upper limbs straightly together beside the ear. After the exercises, we ask the child to have the correct sitting posture, and then we measure the distance with a tape measure between the two markers, the obtained value is recorded in millimeters. The obtained value is the difference between the two values.

Scoring

The normal value is when the difference is less than 3 millimeters in a positive or negative direction. The lumbar motor control ability is not normal, if there is a bigger difference than 3 millimeters in a positive or negative direction (Enoch, 2011; Kovácsné, 2017).

The applied back school program

Theoretical, educational curriculum

Children were provided with 15 minutes of theoretical curriculum each week within the class. We started the lessons with easy introductory games, followed by theoretical knowledge, with the aid of devices designed for demonstration of spine functions. Children had to show the bony markers on themselves and each other through play. During the theoretical course, we taught anatomical, biomechanical, ergonomic, and spine-related knowledge to the children. This knowledge has been collected together and published as a book in English and Hungarian. The book was made by physiotherapists, a writer, a nursery school governess, an instructress, and an infantile clinical psychologist, family therapist (Szilágyi, 2019).

Exercise program

The exercise sessions lasted 30 minutes each week within the class, under the leadership of two physiotherapists, separated in groups. Additionally, children spent four times a week, 10 minutes with exercises connected to the back school program in physical education classes, under the leadership of the teacher. These exercises were designed by physical therapists. Finally, seven times a week, we asked them to spend 10 minutes of exercising based on instructions included in the didactic material for home (Szilágyi, 2019; Kollmuß, 2001; Cardon, 2007; Hill, 2015).

Didactic material for home

The didactic material for home included review questions from the theoretical curriculum learned in the previous lesson, questions to control knowledge, as well as the exercise material of games played during the lessons. In the didactic material, children had to indicate how many times a week, with how many repetitions and how many minutes they did each exercise.

Data Analysis

SPSS software version 22.0 was used for statistical analyses. The results are presented in frequency and confidence interval, as well as in mean±standard deviation, median and interquartile range values. Based on the results of the normalcy tests (Kolmogorov-Smirnov test) the distribution of the data does not imply normal. Differences between the intervention and control group were examined by the chi-square test and Mann-Whitney U test, while the effectiveness of the program was examined by chi-square test and Wilcoxon test. The results were considered significant at $p<0.05$ level.

Results

Results at the baseline measurement (n=102)

The mean point of the total score targeted to the back care knowledge was 2.490±2.536 points, the mean point of the anatomical, biomechanical knowledge was 1.167±2.092 points, and the mean point of the spine use, ergonomic knowledge was 1.324±1.109 points. The total score of the back care knowledge was inadequate in 99.020% (CI lowest: 94.902; CI highest: 100.000) (adequate: $x \leq 80\%$).

The mean point of the total score in habitual posture was 53.137±10.576 points, the mean point of the posture deemed correct was 41.225±14.631 points. The maximum point of both types of postures was close to 50 points, which is the half score of the maximally correct posture. We can say that these are low scores, inappropriate knowledge.

The mean second of the trunk flexor static muscle strength was 3.804±6.482 seconds, and of the trunk extensor static muscle strength was 8.029±6.180 seconds. None of the trunk static muscle strength tests reached the normal range (normal: $x \geq 10$ sec).

The frequency of the negative results of the hip flexor muscle flexibility in the right leg was 48.039 (38.343-57.735)%, in the left leg was 49.020 (39.318-58.721)%, and the frequency of the negative results of the knee flexor muscle flexibility in the right leg was 26.471 (17.909-35.032)%, in the left leg was 29.412 (20.569-38.254)%. The hip flexor flexibility test on both sides was positive at more than half of the children, and the knee flexor flexibility test on both sides was positive at more than 70% of the children.

The mean millimeter of the lumbar motor control ability was 8.353±5.055 millimeters. It was out of the normal range (normal: $-3<x<3$ millimeter).

Back Care Knowledge and Spine Disease Prevention (Table 2)

Table 2. The results of knowledge of spinal function in the intervention and control groups

		Intervention group (n=26)		**Control group (n=22)**		**Differences between the intervention and control groups**
		Mean ± SD (point)	**p-value**	**Mean ± SD (point)**	**p-value**	**p-value**
Total score	pre	2.423 ±3.911	<0.001	2.318 ±1.862	0.155	0.245
	post	19.115 ±2.833		3.227 ±2.159		<0.001
Anatomical, biomechanical	pre	1.154 ±3.082	<0.001	1.045 ±1.253	0.346	0.104
	post	13.846 ±1.642		1.636 ±2.037		<0.001
Spine use, ergonomics	pre	1.269 ±1.185	<0.001	1.273 ±1.241	0.331	0.982
	post	5.269 ±1.343		1.591 ±1.297		<0.001

Pre: baseline, before the program; post: after the program; SD: standard deviation

Habitual posture and posture deemed correct (Table 3)

Table 3. The results of the total score of habitual posture and posture deemed correct in the intervention and control groups

		Intervention group (n=26)		Control group (n=22)		Differences between the intervention and control groups
		Mean ± SD (point)	p-value	Mean ± SD (point)	p-value	p-value
Total score of habitual posture	pre	53.846 ±10.130	<0.001	52.500 ±10.089	0.644	0.645
	post	81.154 ±9.829		54.091 ±11.406		<0.001
Total score of posture deemed correct	pre	40.962 ±16.311	<0.001	41.364 ±13.903	0.118	0.983
	post	91.346 ±6.566		45.909 ±8.679		<0.001

Pre: baseline, before the program; post: after the program; SD: standard deviation

Trunk static muscle strength (Table 4)

Table 4. Results of the trunk muscle strength in the intervention and control groups

	Intervention group (n=26)		Control group (n=22)		Differences between the intervention and control groups
	Mean ± SD (s)	p-value	Mean ± SD (s)	p-value	p-value
TFSM pre	3.615 ±7.910	<0.001	3.818 ±8.404	0.203	0.950
TFSM post	56.885 ±113.748		4.318 ±2.801		<0.001
TESM pre	8.962 ±5.963	<0.001	8.045 ±4.603	0.649	0.917
TESM post	77.000 ±139.801		8.682 ±4.714		<0.001

TFSM: trunk flexors' static muscle strength; TESM: trunk extensors' static muscle strength; pre: baseline, before the program; post: after the program; s: second; SD: standard deviation

Lower limb muscle flexibility (Table 5)

Table 5. Results of the lower limb muscle flexibility in the intervention and control groups

	Intervention group (n=26)		Control group (n=22)		Differences between the intervention and control groups
	Frequency (%) CI (lower-upper)	p-value	Frequency (%) CI (lower-upper)	p-value	p-value
Right HF pre	46.154 (27.991-65.316)	0.004	50.000 (29.106-70.894)	1.000	0.793
Right HF post	84.615 (70.747-98.484)		54.545 (33.738-75.353)		0.024
Left HF pre	46.154 (26.991-65.316)	0.002	50.000 (29.106-70.894)	1.000	0.793
Left HF post	84.615 (70.747-98.484)		54.545 (33.738-75.353)		0.024
Right KF pre	23.077 (6.882-39.272)	<0.001	27.272 (8.662-45.883)	1.000	0.741
Right KF post	80.769 (65.620-895.918)		31.818 (12.355-51.281)		0.001
Left KF pre	26.923 (9.873-43.973)	<0.001	31.818 (12.355-51.281)	1.000	0.713
Left KF post	80.769 (65.620-895.918)		36.363 (16.262-56.465)		0.002

HF: hip flexor; KF: knee flexor; pre: baseline, before the program; post: after the program; %: negative test percentage; CI: confidence interval

Lumbar motor control ability (Table 6)

Table 6. Results of lumbar motor control ability in the intervention and control groups

	Intervention group (n=26)		Control group (n=22)		Differences between the intervention and control groups
	Mean ± SD (mm)	p-value	Mean ± SD (mm)	p-value	p-value
LMC pre	8.269 ±5.474	<0.001	8.682 ±4.970	0.614	0.489
LMC post	0.154 ±0.368		8.136 ±4.144		<0.001

LMC: lumbar motor control ability; pre: baseline, before the program; post: after the program; mm: millimeter; SD: standard deviation

Discussion

Back Care Knowledge and Spine Disease Prevention

Habybabady et al. (2012) examined 404 children (203 in the intervention group, 201 in the control group, aged 10-11) before and after a back care education program on the change of back care knowledge and behavior. A week after the intervention, knowledge promotion in the intervention group was significantly higher than the control group after adjusting for primary knowledge scores (p<0.001) (Habybabady, 2012).

Cardon et al. (2007) measured the change of back care knowledge and fear-avoidance beliefs among 555 children (mean age at baseline: 9.7 years±0.7 years). In the group combining back care with physical activity promotion were 190 pupils, in the back care group were 193 children and the control group consisted of 172 children. In both intervention groups, the scores for back care related knowledge and back care behavior were significantly (p<0.05) higher than the control group (Cardon, 2007).

In the research of Tóthné and Tóth (2015), they measured the back care knowledge of 111 children before and eight months after the „Porci Berci" back education program. 79.33% of the children gave correct answers to the questions about lexical knowledge acquired from the spine, 93% recognized correct posture, and 79.01% managed to acquire spine-friendly movements (Tóthné, 2015).

We did not find any questionnaire targeted the curriculum, therefore we used a self-developed back care knowledge questionnaire. In the intervention group, the total score, the anatomical-biomechanical, and the spine use-ergonomic knowledge were significantly ($p<0.001$) better for the end of the program and were significantly ($p<0.001$) better than the control group's results after the program.

Habitual posture and posture deemed correct

Kovácsné et al. (2016) examined the change of the habitual posture among 30 (mean age: 12.7±2.2 years) ballet dancers and 32 (13.7±2.9 years), hip-hop dancers, on the effect of a 3-month core stability training program. The habitual posture measured after the program improved by a high percentage in both groups (ballet 52.17%, hip-hop 37.5%) (Kovácsné, 2016).

Kayapinar et al. (2012) tested the efficacy of a back school program among 80 (40: intervention group, 40: control group) 5-7 years old children on the change of posture. They also used the New York State Posture evaluation. In the intervention group, 8 from the 13 measured parameters showed significant ($p<0.05$) improvement in the intervention group and 4 parameters measured after the program were significantly ($p<0.05$) better in the intervention group than in the control group (Kayapinar, 2012).

In our research, the total score of the habitual posture ($p<0.001$) and posture deemed correct ($p<0.001$) significantly improved in the intervention group for the end of the program and were significantly ($p<0.001$) better than the control group's results after the program.

Trunk muscle strength and lower limb muscle flexibility

As a result of the „Porci Berci" program, between 1998-2009, 1138 children were measured with the Matthias test (posture test). According to the results in 1998, although 249 between the ages 8-10 years 30.52 % of the children could carry the test correctly, in 2004, 2005 and 2009, the repeated tests showed a steadily deteriorating tendency (Tóthné, 2015).

In the research of Somhegyi et al., during the school year of 2001/2002, 200 6-14 years old children took part in the primary prevention program of the Hungarian Spine Society and 213 in the control group. In the intervention group, all the 12 muscle tests (responsible for posture) significantly ($p<0.01$) improved. In the control group in some of the abdominal and back muscle tests significant ($p<0.01$) improvement came to be, though this result was significantly ($p<0.01$) lower than the improvement in the intervention group, 6 muscle tests have not been changed and 4 showed significant ($p<0.05$) decadence (Tóthné, 2015). In the school year of 2009/2010, they measured 530, 7-12 years old children, who took part in the same program for 6 months. The static muscle strength and muscle flexibility showed significant ($p<0.001$) improvement at the end of the program (Tóthné, 2015).

In the research, that we conducted the trunk flexor ($p<0.001$), trunk extensor ($p<0.001$) static muscle strength, and the lower limb flexibility ($p<0.001$) tests significantly improved in the intervention group for the program and were significantly better than the control group's results measured at the end of the program.

Lumbar motor control ability

We did not find any back school program research in the literature that examined the lumbar motor control ability. We can compare our results to the research of Kovácsné et al., who examined 30 (mean age: 14.86±1.00 years) ballet dancer children's lumbar motor control ability after the implementation of a new core prevention training program for low back pain. For the end of the 3-month program, the lumbar motor control ability improved significantly ($p<0.001$) (Kovácsné, 2017). The lumbar motor control ability significantly ($p<0.001$) improved in the intervention group for the end of the program.

Conclusions

We measured the back care knowledge with the evaluated and developed back care knowledge and spine disease prevention questionnaire, we evolved a complex (trunk flexor-extensor static muscle strength, flexibility of shortening muscles, influencing the posture, habitual posture and posture deemed correct, lumbar motor control ability) test system, and a 1-school year back school program, that improves back care knowledge, and spinal function (theory) and trunk state (practice), under the name of „The Amazing Spinal Trip". The program should be tested in kindergarten.

Limitations

The research was conducted on a small size of the population, a more significant number of the population would allow more reliable conclusions. There was no follow-up in the study.

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Disclosure of interest
The authors report no conflict of interest.

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