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PREVENTING CHILDREN'S DEFICIENCIENT BODY POSTURE THROUGH SWIMMING

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Abstract: *The paper focuses on the observation and harmonious physical development of students, which is located in the general objectives of physical education classes. Nationally and globally there are numerous scientific papers on the subject. However, prevention of poor body posture it is far from being exhausted. On the contrary, the recent intensification in curricular and extracurricular activities is not consistent with the capabilities and possibilities of children, leading to various problems of the spine and at the same time the accelerated growth of body height. In this regard, we aim to achieve a specific swimming programme to ensure the normal growth and development of schoolchildren.*

Keywords: *prevention, swimming, means, school.*

Introduction. In the opinion of Stoenescu G. (1990) the health and harmonious physical development of children it are particularly important to the family and society. Ensuring the necessary conditions for the care and upbringing of children it is nowadays a major concern.

Preventing an impaired body posture can be attributed to all the factors and persons involved in the children's educational process. Continuous prophylactic training of body posture, by exercises performed both on the ground and in water is the only option that can bring positive results. Timely performed morphological-functional examination can lead to normal growth and harmonious development and to better deployment and coordination of morphological, functional and mental capacities of children.

The normal posture of the body is defined [1, 2, 8] as all static and dynamic functions of the musculoskeletal system, under the control of the central nervous system and influenced by the psychological particularities of the individual. The body's posture can be influenced by hereditary factors, which manifest as the constitution type, CNS (Central Nervous System) activity, muscle tone, some reflexes, habits and awareness of good posture.

Research has revealed that the frequency of physical deficiencies in children of school age is very high. Before and during puberty growth bone processes are faster, increasing more in length than thickness, so is the a height increase is noticed first, and supporting musculature is deficient, favouring the emergence misaligned musculoskeletal structures [3, 4].

Swimming is proposed as a means to prevent these misalignments, especially in the spine. Swimming can be used as therapeutic means, but also for prophylactic purposes [5, 6, 7]. Specific to swimming, being immersed in water affects the body in the following ways: the horizontal position of the body; water pressure acting on the body; musculoskeletal activity; morphological and functional adaptation processes; and psychomotor adaptive processes.

The hypothesis of the paper. It is assumed that regularly practice swimming and selecting the most effective swimming exercises can bring positive changes postural changes in school-age children.

The purpose of the paper. There is a need to

study and research issues related to growth and development of school children, prophylaxis of body posture impairments by specific means to swimming.

Research methods and organisation. To investigate the subject the following method was used: literature review, empirical observation, empirical testing, pedagogical experimentation, statistical analysis and graphical representation. The experiment was conducted over a period of three months, January through March 2016. To start the experiment, physical education teachers were involved by carrying out initial and final tests.

Out of 200 pupils, 15 girls and 15 boys were selected for the experiment group.

To achieve the prevention program, specific structured swimming exercises were selected, focusing mainly on the training and education of students on correct postural attitude. Care was taken to ensure pleasant, attractive and varied swimming training.

BODY POSTURE PROGRAM FOR PREVENTION OF DISABILITIES IN SCHOOLCHILDREN

Table 1. Educating the complex neuromuscular reflex and psychic, leading to the right attitude to provide training for self-control static and dynamic position and its water awareness

STAGE I		Duration: four weeks Total distance covered: 150-300m Lesson Duration: 50 min. 3 sessions / week.	TARGETS
CONTENT		dosage	Underlining the essential elements of correct body attitude in various plains
1	Walking through water	4x10m	
2	Walk through the water with arms movements in different planes	4x10m	
3	Running through water	2x7m	
4	Transgression water	4 x	
5	Floating vertically	3 x	
6	Floating chest	3 x	
7	Floating back	3 x	
8	Sliding on chest	3 x7m	
9	Sliding back	3 x7m	
10	Sliding on some motions feet	2 x5m	
11	Aquatic breath	5 x	

Table 2. Specific program for muscle toning and maintain the correct body posture/attitude

STAGE II		Duration: four weeks Duty: 300-400m Lesson Duration: 50 min. 3 sessions / week.	TARGETS
CONTENT		dosage	
1	Feet rafting crawl	4x12,5m	
2	Sliding crawl with breathing in each arm	4x12,5m	Developing the back muscles
3	Sliding back paddling simultaneously	2x25m	
4	Process back	4x25m	

	CONTENT	dosage	
1	crawl process	4x25m	The specific development of the chest muscles
2	With a raft floating in the crotch or legs crossed, enforcement arm movement bras	2x12,5m	
3	Breaststroke arms, legs crawl	4x12,5m	
4	The process bras	4x25m	

	CONTENT	dosage	
1	Sliding crawl with breathing two or three arms	4x12,5m	Chest muscle development and particularly the diaphragm muscle
2	Sliding crawl asymmetric with breathing arm coming out of water	2x7m	
3	Sliding feet breaststroke crawl with breathing to a cycle of arms	4x25m	
4	Sliding breathing bras with two cycles of arms	2x12,5m	

	CONTENT	dosage	
1	Movements foot crawl with cork	6x12,5m 2x25m	Abdominal and lower back muscle development and
2	Movements back with outstretched arms standing in the extension body	6x12,5m 2x25m	
3	Breaststroke leg movements rafting	6x12,5m 2x25m	
4	Butterfly leg movements rafting	4x12,5m	

Table 3. Specific program for muscle toning the maintaining the correct body posture/attitude

STAGE III		Duration: four weeks Duty: 400-600m Lesson Duration: 50 min. 3 sessions / week.	TARGETS
	CONTENT	dosage	
1	crawl process	4x12,5m 2x25m	The specific development of the lower and upper arms, thighs and legs
2	back process	4x12,5m 2x25m	
3	brass process	4x12,5m 2x25m	

	CONTENT	dozare	
1	Exercises performed with the arms (crawl, back, breaststroke) objects without.	6x 12,5m	The specific development of scapular-humeral and hip mobility
2	Exercises performed with the feet (crawl, back, breaststroke, butterfly)	6x12,5m	

The motor function tests (strength and mobility) used in the program carried out had the aim of determining the influence of swimming on strength and spine mobility. The indicators which showed more variation are represented graphically. The experimental group, both girls and boys, had better results in the strength tests: sit-ups (lifting the trunk from lying face up) boys had an increase from 18.80±1.60 to 23.20±1.52, t = 6.15, P<0,001 , while girls had an increase from 13.67±2.62 to 19.00±1.41, t = 6,05, P<0,001.

For leg strength, the broad jump shows a positive score, with the maximum difference Δ=2.5 points.

At push-ups, experiment group boys increased from 13.60±3.71 to 19.33±2.53 (t=4.15, P<0.001). The girls improved from 9.6±1.97 to17.93±1.42, with a calculated t higher than the spreadsheet (P<0.001), showing a strong statistical significance.

Interpretation and processing:

Table 4. Results indicate the strength and mobility of the subjects included in the experiment

Crt. nr.	Testing	Initial testing boys			Final testing boys			t	P	Initial testing girls			Final testing girls			t	P
		X±m	S	Cv	X±m	S	Cv			X±m	S	Cv	X±m	S	Cv		
1	Extensions of the trunk of lying face nr.rep. / 20 sec	27,93 ±5,93	6,92	0,25	33,80 ±5,39	5,97	0,18	2,43	<0,05	24,33 ±2,98	3,66	0,15	27,67 ±4,18	5,08	0,18	1,90	>0,05
2	Extensions of legs lying face nr.rep. / 20 sec	19,20 ±2,03	2,88	0,15	22,93 ±1,96	2,71	0,12	3,70	<0, 01	20,53 ±2,70	3,34	0,16	23,27 ±2,99	3,35	0,14	1,93	>0,05
3	Lifting the dorsal trunk of lying nr.rep. / 20 sec	18,80 ±1,60	2,14	0,11	23,20 ±1,52	2,18	0,09	6,15	<0,001	13,67 ±2,62	2,99	0,22	19,00 ±1,07	1,41	0,07	6,05	<0,001
4	Lifting the legs of lying dorsal nr.rep. / 20 sec	17,67 ±2,18	2,77	0,16	21,40 ±1,84	2,13	0,10	4,00	<0,01	17,27 ±1,79	2,15	0,12	18,73 ±1,16	1,53	0,08	2,20	<0,05
5	Pushups in gym bank nr.rep. / 20 sec	13,60 ±3,71	4,17	0,31	19,33 ±2,53	3,20	0,17	4,15	<0,001	9,60 ±1,97	2,44	0,25	17,93 ±1,42	1,87	0,10	10,35	<0,001
6	Broad jump (cm)	160,07 ±7,68	9,44	0,06	163,07 ±6,89	8,21	0,05	0,86	>0,05	144,53 ±8,36	10,73	0,07	146,87 ±7,32	9,48	0,06	0,61	>0,05
7	Index chin-sternum in flexion (cm)	0,00 ±0,00	0,00	0,00	0,00 ±0,00	0,00	0,00	0,76	>0,05	0,00 ±0,00	0,00	0,00	0,00 ±0,00	0,00	0,00	0,72	>0,05
8	Index chin-sternum in extension (cm)	17,80 ±0,77	0,94	0,05	18,80 ±0,67	0,86	0,05	0,77	>0,05	17,93 ±1,27	1,62	0,09	18,33 ±0,93	1,18	0,06	2,91	<0,05
9	Test-ground flexed fingers (cm)	5,27 ±6,09	8,01	1,52	0,80 ±1,28	1,78	2,23	2.07	>0,05	5,80 ±5,47	7,03	1,21	1,80 ±2,40	3,00	1,67	1,97	>0,05
10	Test ground occiput in extension (cm)	101,73 ±9,88	12,03	0,12	90,40 ±3,95	5,29	0,06	2,09	>0,05	103,40 ±8,35	10,96	0,11	92,80 ±6,83	8,09	0,09	3,06	<0,01
11	Test-ground side slope fingers dr. (cm)	37,60 ±2,03	2,53	0,07	35,93 ±1,94	2,40	0,07	0,47	>0,05	37,80 ±3,92	5,31	0,14	38,73 ±2,28	2,79	0,07	2,00	>0,05
12	Test-ground side slope fingers stg. (cm)	38,33 ±2,00	2,58	0,07	36,53 ±1,83	2,20	0,06	1,40	>0,05	38,00 ±3,87	5,03	0,13	38,73 ±2,32	2,81	0,07	2,14	<0,05

Note: E – group experiment; n-15, f-14: P – 0,05; 0,01; 0,001. n-15, f-28: P – 0,05; 0,01; 0,001.
t – 2,145 2,977 4,140 t – 2,048 2,763 3,674

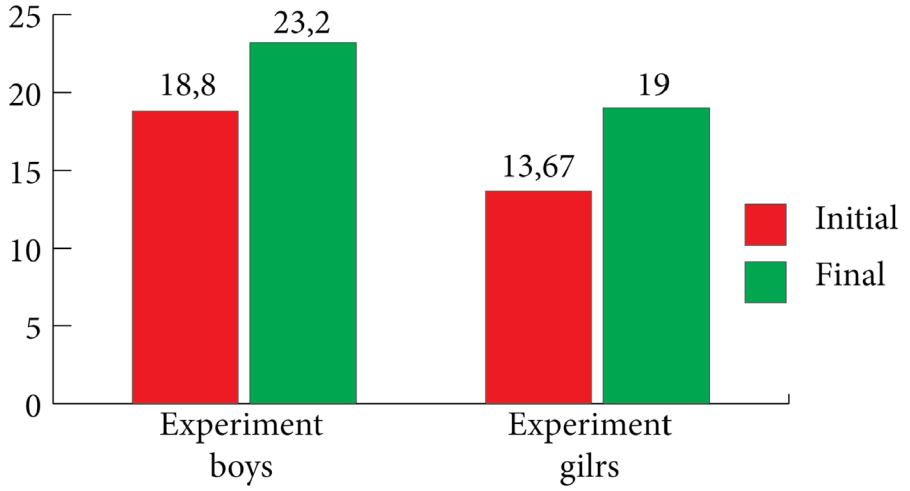

Figure 1. Increase in abdominal force in the experiment group

Tests showing spine flexion and extension mobility and side slope are hard to represent. The spine's mobility is influenced by several factors (fatigue, cold, muscle mass measurement technique, mental state) and the differences achieved between the initial and final testing are not statistically significant (P>0.05).

Sliding on the chest and back, where dynamic balance is developed, showed a positive result with significant differences in both boys and girls. Sliding on his/her chest: boys had an increase from 5.6±0.72 to 6.67±0.53 (P<0.01) and the girls had an increase from 5.4±0.67 to 6.8±0.53, with a final t calculated of 5.07, higher than the

spreadsheet one. P<0.001 shows strong statistical significance.

Table 5. The results of the experiment specific swimming indices

Crt. nr.	Testing	Groups of subjects	TI X±m	TF X±m	t	p
1	Sliding on chest (m)	G	5,40±0,67	6,80±0,53	5,07	<0,001
		B	5,60±0,72	6,67±0,53	4,00	<0,01
2	Sliding back (m)	G	5,53±0,84	6,53±0,50	3,46	<0,01
		B	5,07±0,51	6,33±0,49	4,85	<0,001
3	Sliding on foot crawl chest moving 12.5 m (sec)	G	18,21±0,86	16,83±0,63	3,82	<0,01
		B	15,34±0,68	14,07±0,65	3,66	<0,01
4	Sliding chest moving feet 12.5 m breaststroke (sec)	G	21,18±1,42	18,99±0,78	4,12	<0,01
		B	19,16±0,91	17,37±0,64	4,87	<0,001
5	Sliding chest moving arms crawl 12.5 m (sec)	G	17,40±0,48	16,40±0,59	3,70	<0,01
		B	14,38±0,84	13,48±0,56	2,58	<0,05
6	Sliding chest moving arms bras 12.5 m (sec)	G	18,89±0,84	17,94±0,55	2,86	<0,05
		B	17,45±1,03	16,26±0,89	2,58	<0,05
7	Swimming in coordination crawl 25m (sec)	G	27,90±1,11	24,64±1,48	5,51	<0,001
		B	26,66±0,88	23,15±1,40	6,82	<0,001
8	25 m breaststroke swimming in coordination (sec)	G	32,91±1,25	30,08±1,51	4,44	<0,001
		B	31,81±1,44	29,12±1,46	4,36	<0,001

Testing sliding on the chest crawl stroke and sliding on the chest breaststroke showed positive results. The values achieved showed significant differences for both boys and girls, with P<0.01 and P<0.001 respectively, showing good statistical significance. Crawl stroke swimming shows a positive result with a "t" calculated of 5.51 6.82 for girls and boys respectively and P<0.001, a strong statistical significance. The boys had showed an improvement from 26.66±0.88 to 23.15±1.4, while girls improved from 27.9±1.11 to 24.64±1.48.

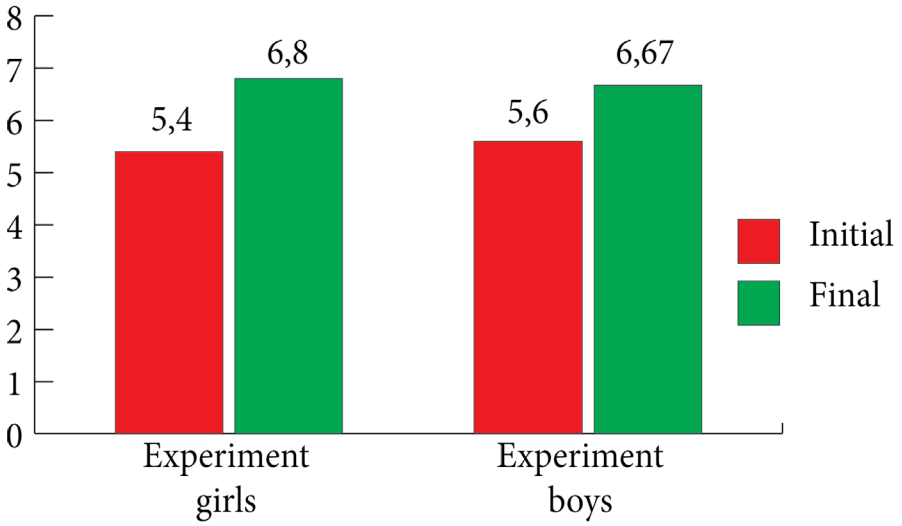

Figure 2. Graphical representation of results of specific indices swimming ("chest test sliding")

Coordinated breaststroke swimming showed positive results, with strong statistical significance. Girls and boys had calculated "t" 4.44 and 4.36 higher than tabular values respectively and P<0.001.

Overall results from final tests in both girls and boys indicated the development of a program with a positive effect on efficiency and specific swimming qualities, strength, balance, speed and functional capacity to lift physiological parameters, which improves the postural functions of the body, both static and dynamic.

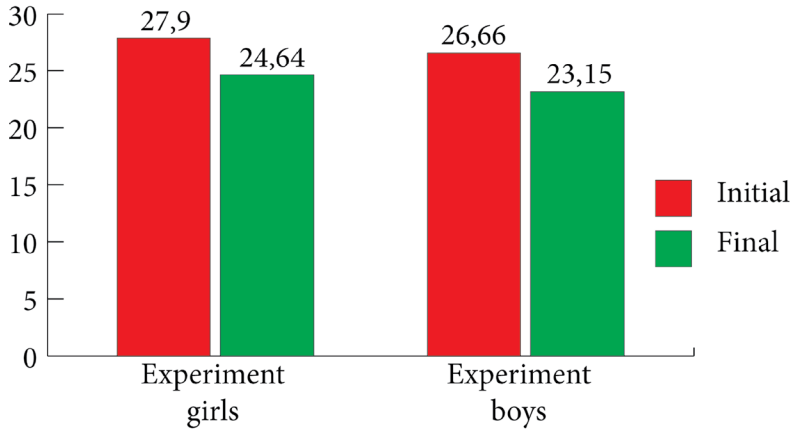

Figure 3. Results of specific indices swimming (swimming in coordination crawl)

Conclusions:

1. The ability to assimilate the techniques of swimming in prepubescent children is increased due to the variety of techniques used and a creative approach to swimming practice;
2. There is a significant improvement in all biomotric indices used in this experiment;
3. In terms of motor skills (mobility and strength) the trend is highlighted by the values of the indicators used;
4. From the point of view of correct body posture and conduct leading to bad posture, due to training, conscious and active participation of the subjects in the program under study, an improvement in the body's posture awareness and the desire to eliminate the vicious conduct leading to the installation of posture deficiencies were observed.

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