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6-7 YEARS PRESCHOOL CHILDREN MOTOR SKILLS TRAINING AS THE SPINE DISORDERS PROPHYLAXIS

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Abstract

Background. High preschool age is the one at which children's body show a sharp increase in somatic and functional parameters. It is at this age that a series of deficiencies occur in the body of children, often being characteristic for the spine.
Objectives. At this age, an intervention of specialists is required, first of all in the field of physical education. If it is not intervened with concrete methodologies to prevent these deficiencies, they may worsen as children get older.
Methods. For this purpose, a model of means for their application in the physical education and at home with the preschoolers was developed and implemented in a series of preschool units.
Results. The model had a positive effect on preventing the occurrence of different deficiencies of the bone system and first of all the spine in children.
Conclusion. It is shown that by using at large scale the correctly selected physical exercises, one can have a prophylaxis effect of the possible deficiencies of the spine, namely at the age of 6-7 years.

Keywords: *preschool children, spine deficiencies, prophylaxis, motor training*

Introduction

The situation created in the physical education system of preschoolers dictates the need to look for and apply modern methods and means, with a low degree of difficulty, but very efficient, which will contribute to the timely development of physical and psychomotor capacities for the purpose of better health and increased motor experience.

However, the practice shows that most children in pre-school institutions face various problems related to the locomotor system, more specifically the condition of the spine, which is the basic pillar of the human body. The age of 6-7 years is one where the skeleton of the human body is growing, and the specialists in the field of physical education and sport must take into account a series of physiological and anatomical legalities specific to the respective age.

The specialists in the field [6, 7, 8, 10] come with a series of recommendations in this chapter, but these, in the most frequent cases, are medical, that is to say, the application of various medical devices and very rarely is based on the application of the means of physical education and sport [1, 2, 3, 4, 5, 9].

Unjustly, in this case the role of physical exercises for prophylaxis of diseases related to the spine of preschoolers is diminished. Specifically, this aspect, regarding the prophylaxis of spinal deficiencies, has interested us especially in our research and which we consider quite current and absolutely necessary for the field of physical education of preschoolers. For this reason we initiated a pedagogical experiment lasting one year, where we developed an experimental model focused on the means of physical education under different special exercises complexes that the children carried out in the kindergarten, but also at home under the attention and control of parents. All of these were aimed at prophylaxis of the deficiencies of the spine of the children involved in this experimental study, as well as examining the efficiency of the application of the means of physical education on the level of their motor training.

The experimental program

In order to verify experimentally the efficiency of the practical application of the pedagogical model of prophylaxis of spinal deficiencies, as well as of the experimental program developed by us, we conducted a pedagogical experiment lasting one year with the children from the preschool institutions in Bucharest (Romania), they are 6-7 years old, graduates of pre-school institutions. Both at the beginning of the pedagogical experiment and at the end of it all the children were tested on four basic indicators that were of particular interest to us. This is about the dynamics of children's motor training, the indices of physical development, the functional and of course training, the evolution of the deficiencies of the spine of the children examined.

Results

In the following we will present the evolution of the motor training indices of the children involved in the pedagogical experiment (Table 1).

Table 1. *The results of the physical training of the preschoolers of 6-7 years in the pedagogical experiment*

No.	Tests	Gender	National Standard	Initial evaluation $\bar{X} \pm m$	Final evaluation $\bar{X} \pm m$	t	P
1.	Push-ups (no)	Boys	8	5,16±0,17	6,02±0,16	3,91	< 0,001
		Girls	8	2,48±0,15	3,35±0,15	4,35	< 0,001
2.	Abbs (no)	Boys	15	7,04±0,20	8,11±0,19	4,11	< 0,001
		Girls	15	6,45±0,19	7,24±0,19	3,16	< 0,01
3.	Forward bending (cm to floor)	Boys	+5	0,30±0,09	0,59±0,09	2,42	< 0,05
		Girls	+5	0,31±0,10	0,60±0,09	2,23	< 0,05
4.	Long jump on the spot (cm)	Boys	140	76,12±1,27	80,04±1,25	3,14	< 0,01
		Girls	130	72,08±1,49	77,13±1,47	2,58	< 0,05
5.	Short distance running (3x10 m)	Boys	9,4	12,16±0,09	11,84±0,09	2,67	< 0,01
		Girls	9,6	13,08±0,11	12,66±0,10	3,00	< 0,01

According to Table 1, for the evaluation of motor training, five tests were subjected to the research, which largely assesses the level of motor preparation of the children included in the pedagogical experiment, these being the push-ups (test for assessing the development of the strength of the arms), abbs (test for assessing the level of development strength of the abdominal muscles), forward bending (test for assessing the level of development of the spine mobility), long jump on the spot (test for assessing the level of development of the explosive force) and short distance running (test for assessing the level of skills).

If we analyze the first test, the push-ups (fig. 1), which represents the level of development of the strength of the arms, we notice that in both boys and girls, the final results are much higher compared to the initial ones. Although, in both groups there were statistically significant increases ($P < 0.05$), in both cases the results do not reach the maximum standards of children for this age, which is equivalent to 8 push-ups.

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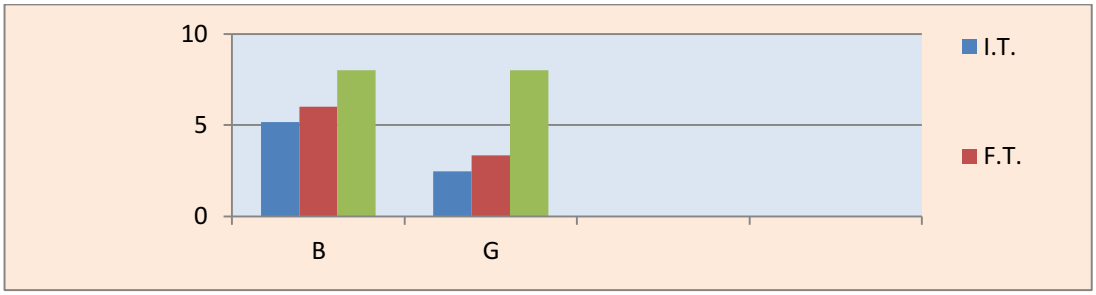

Fig.1 The results of the hands strength test of the children included in the pedagogical experiment

If we look at the evolution of children at this parameter we notice that in boys the initial data were equal on average with 5.16 push-ups, and in girls with 2.48 push-ups, that at the end of the experiment this indicator would increase to 6.02 push-ups in boys and 3.35 push-ups for girls. As mentioned, the final results are below the national standards at this criterion, but here we have to make a remark that comes to clarify this, being the highest national scale, and the minimum scale being equivalent to 2 push-ups. Therefore, this indicator has increased quite a lot, although the force is not the most indicated quality that can be developed at this age, according to the sensitive periods of development of the motor qualities.

Another group of muscles that was subjected to research was the abdominal one, which represents the level of development of the abdominal strength of the children (Fig. 2.). In fact, this test as well as the previous one is the one that represents the level of the development of the force, but this time it is about the abdominal force, which was represented by the test called abbs, that is, lifting the trunk from the lying position in 30 seconds. This is a standardized test applied in pre-school institutions.

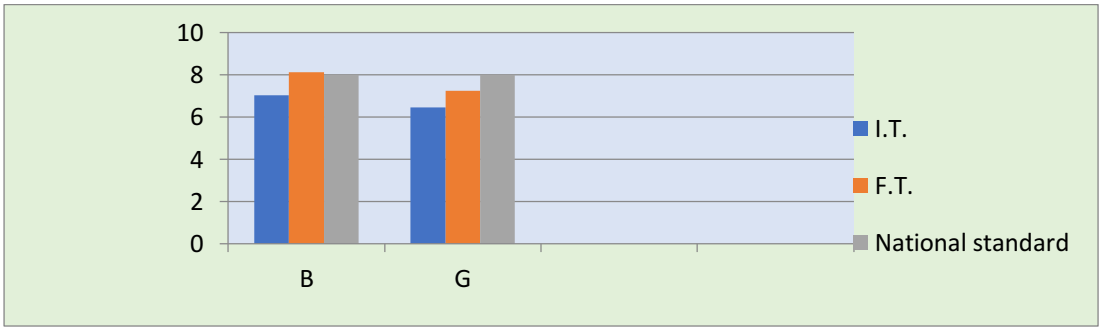

Fig.2 The results of the abdominal muscles strength test of the children included in the pedagogical experiment

As in the case of the previous sample, in this indicator, statistically the children made quite significant progress in both boys and girls (P <0.05). If we analyze the results of the boys at the initial test we notice that they are equal to 7.04 trunk lifts, that at the end of the pedagogical experiment they increase to 8.11 trunk lifts. Although the visible difference does not seem to be too large, statistical calculations have shown that this is significant where P <0.05.

The same tendency is noticed in the case of girls, who at the beginning of the experiment registered a result equal to 6.46 trunk lifts, that at the end of the experiment it would increase to 7.24 trunk lifts. Statistical calculations showed that the difference between the initial and final results was significant (P <0.05).

Although, in both cases, boys and girls, the final results were below the national standards at this indicator, it is worth noting that they had a rather high ascendancy compared to the initial data, which speaks

to the efficiency of the experimental methodology applied with the children involved in the pedagogical experiment.

The next indicator subjected to our research was the appreciation of the spine mobility for children aged 6-7 years (Fig.3), which was represented by the bending forward test, from the standing on the gym bench position, where the child was to make a maximum forward bending and the distance that the children covered by this fold was recorded.

According to the literature, children aged 6-7, both girls and boys, should have at least 8-10 centimeters (plus) at this test, although national standards are +5 centimeters in both cases. However, we note that although the results in both cases improved compared to the initial ones, the increases in this respect were not that obvious.

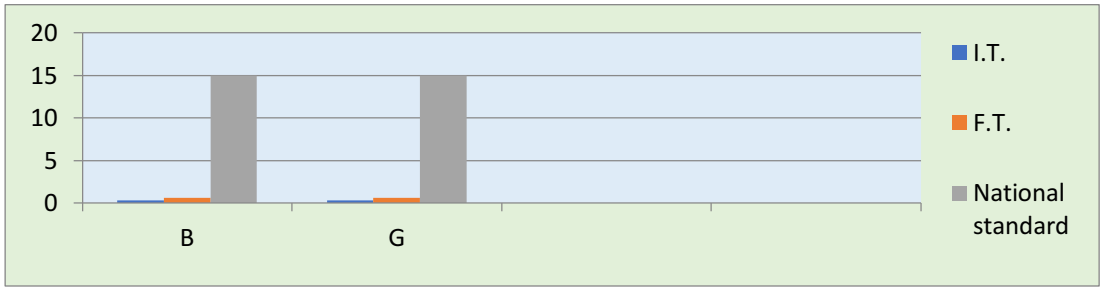

Fig.3 The results of the spine mobility test of the children included in the pedagogical experiment

For example, in boys at initial testing this indicator was equal to 0.30 centimeters, so that at the end of the experiment it would reach values of 0, 59 centimeters. However, statistical calculations indicate a significant difference (P <0.05) between the initial and final results.

The results of this indicator are very little different in the case of girls, where at the beginning of the experiment they had a result equal to 0,31 centimeters, at the end of it reaching 0.60 centimeters. As in the case of boys, the statistical calculations indicated a significant difference (P <0.05).

Another indicator that was subjected to our research was the force-speed, this being represented by the test "long jump on the spot" (Fig. 4).

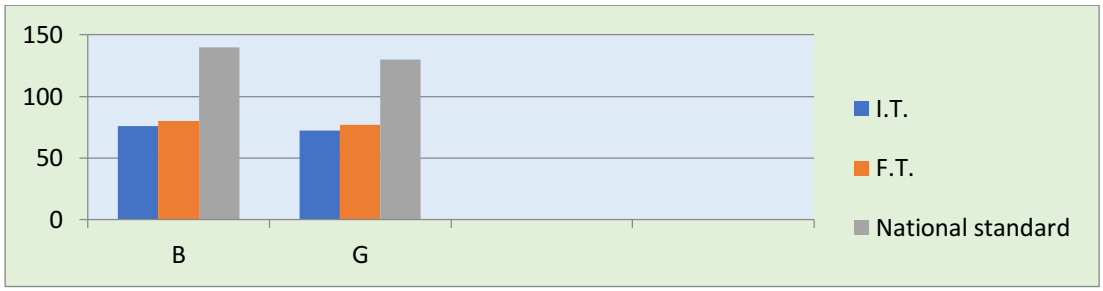

Fig.4 The results of the force-speed test of the children included in the pedagogical experiment

Although the national standards on this indicator are quite high, the children recorded some rather impressive results at the end of the experiment compared to the initial data. It is worth mentioning that this test is not only physical but also technical, that is, children must know the technique of performing this test. This has actually resulted in relatively poor results compared to national standards, where boys are 140 centimeters and girls 130 centimeters.

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Following the recorded results we see that the boys initially had the average result of 76.12 centimeters and at the end of the experiment they progressed to 80, 04 centimeters. The progress of boys in this regard is very clear, where according to statistical calculations the difference was significant (P <0.01).

About the same tendency is noticed in the case of girls, who at the beginning of the pedagogical experiment registered a result equal to 72.08 centimeters that at the end of it progressed to 77.13 centimeters, the difference being about 5 centimeters, and this was statistically significant (P <0.05).

Therefore, the experimental methodology applied with the preschoolers of 6-7 years old was quite effective in the training of their strength and speed, which can generally influence the health of children of that age.

The last indicator that was subjected to the research was the test that expresses the level of development of children's skills, a quality quite important for them, especially at the age of 6-7 years. This quality was tested by means of the 3x10 meter short run test (Fig. 5).

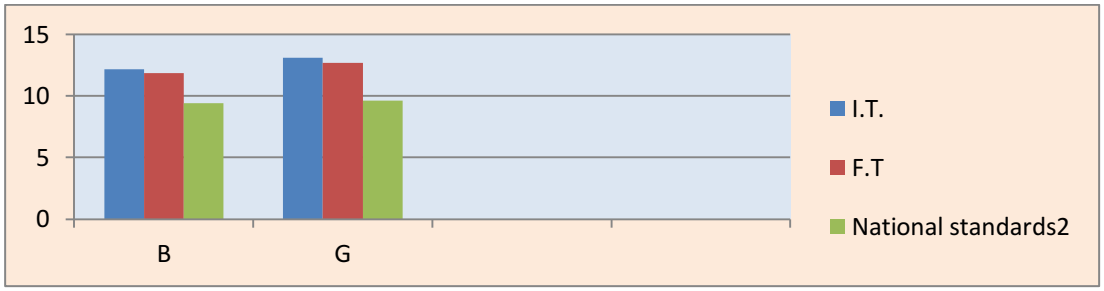

Fig.5 The results of the skills test of the children included in the pedagogical experiment

As with most of the indicators tested, the children had approximately the same tendency in terms of skills, that is, compared to the national standards they were at a lower level. In contrast, the difference between the initial and final results, both for boys and girls, was quite large, and according to statistical calculations this was significant (P <0.01).

If we analyze the results of this indicator separately, we notice that the boys at the beginning of the pedagogical experiment registered results equal to 12.16 seconds of the test, and at the end of the pedagogical experiment they registered 11.84 seconds. At first glance, it would seem that the difference is not too big, but according to the statistical calculations this is a significant one (P <0.01).

The same thing is noticed in the case of the girls, who at the beginning of the experiment registered an average value equal with 13.08 seconds, that at the end of it reaches values equal to 12.66 seconds, that is a difference of about 0.4 seconds, which, over the course of a year is a pretty good result.

So, even in the case of skills, the results of the preschoolers of 6-7 years were as expressive as possible, which confirms once again the efficiency of the experimental methodology proposed by us.

Conclusions

Therefore, analyzing the results of the level of motor training of the preschoolers aged 6-7 years, it is very well demonstrated that the experimental methodology proposed and applied in the pedagogical experiment with the duration of one year was quite effective. Even if they did not reach the national scales for most of the indices under test, the children in all cases improved their initial results.

According to the recorded data, the most eloquent results were detected in the case of the development of the strength of the arms and of the abdominal muscles force, as well as in the development of the skill.

Although visible progress has been made in the development of other motor qualities, however, the most conservative are the speed and force-speed tests, where although significant progress has been made the results have not been as high as for the other tests mentioned above.

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