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## Corrective gymnastics and motor skills of fiveand six-year-old children

Magdalena Rokicka-Hebel

*Gdansk University Physical Education and Sport in Gdansk, Poland, mrokickahebel@awf.gda.pl*

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## Corrective gymnastics and motor skills of five and six-year-old children

### Abstract

**Background:** The purpose of the study was to evaluate motor skills of children participating and not participating in corrective gymnastics activities. It has been assumed that children participating in additional physical activities conducted in nursery school have better motor skills than those staying out of this type of activities. **Material/Methods:** Tests were carried out in two stages. For quantitative research a questionnaire was conducted among headmasters of nursery schools in Gdansk. The qualitative and quantitative research involved: observation, document analysis, tests of educational performance verifying the level of motor skills. A total of 286 five- and six-year-old children were recruited from different preschools (eight preschools and three primary school preschool programs in Gdansk). **Results:** Comparing groups of preschoolers participating and not participating in the activities of corrective gymnastics showed that among five-year-olds attending corrective gymnastics greater skills were noticed only in two of the seven tests: I – walking on a balance bench and II – crawling on an inclined balance bench. Among six-year-olds only in one test: VI – throwing a ball against the wall and catching it. **Conclusions:** Corrective gymnastics viewed as additional physical activity exercise in preschools does not contribute to the development of new motor skills of five- and six-year-olds.

### Keywords

preschool children, corrective gymnastics, motor skills, physical activity

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<p><b>Authors' Contribution:</b>  A – Study Design  B – Data Collection  C – Statistical Analysis  D – Data Interpretation  E – Manuscript Preparation  F – Literature Search  G – Funds Collection</p>	<h2 style="text-align: center;">Corrective gymnastics and motor skills of five- and six-year-old children</h2> <p><b>Magdalena Rokicka-Hebel</b></p> <p>Gdansk University of Physical Education and Sport in Gdansk, Poland</p> <p><b>Key words:</b> <i>preschool children, corrective gymnastics, motor skills, physical activity.</i></p>
<p><b>Background:</b></p> <p><b>Material/Methods:</b></p> <p><b>Results:</b></p> <p><b>Conclusions:</b></p>	<h3 style="text-align: center;">Abstract</h3> <p><i>The purpose of the study was to evaluate motor skills of children participating and not participating in corrective gymnastics activities. It has been assumed that children participating in additional physical activities conducted in nursery school have better motor skills than those staying out of this type of activities.</i></p> <p><i>Tests were carried out in two stages. For quantitative research a questionnaire was conducted among headmasters of nursery schools in Gdansk. The qualitative and quantitative research involved: observation, document analysis, tests of educational performance verifying the level of motor skills. A total of 286 five- and six-year-old children were recruited from different preschools (eight preschools and three primary school preschool programs in Gdansk).</i></p> <p><i>Comparing groups of preschoolers participating and not participating in the activities of corrective gymnastics showed that among five-year-olds attending corrective gymnastics greater skills were noticed only in two of the seven tests: I – walking on a balance bench and II – crawling on an inclined balance bench. Among six-year-olds only in one test: VI – throwing a ball against the wall and catching it.</i></p> <p><i>Corrective gymnastics viewed as additional physical activity exercise in preschools does not contribute to the development of new motor skills of five- and six-year-olds.</i></p>

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**Corresponding author:**

Dr Magdalena Rokicka-Hebel

Gdansk University of Physical Education and Sport in Gdansk

Dep. of Recreational Sports

Kazimierza Gorskiego St. 1, 80-336 Gdansk

E-mail: mrokickahebel@awf.gda.pl; phone: +4858 5547308

## **Introduction**

The period of early childhood (till the 5<sup>th</sup> or 6<sup>th</sup> year of age) is characterised by the most dynamic pace of motor development and great mobility of a child. It is called “the golden motor period” or else “the first motor apogee”. Strong needs – “hunger for movement” and motor “wastefulness” are the features of a small child’s mobility. Considering motor fitness, a five-year-old child steps in the “perfect” pre-school age or golden age” of childhood [1, 2, 3].

We can draw from it practical conclusions: this moment should be utilised and not let escape. It is particularly important for pre-school educators and parents. In this period a child should be taught correctness of the performed movements and activities, should expand its interests by motor games and by proper equipment and proper organisation of activities. If this period is missed in a healthy child and if stimuli are not created for motor development – the child may become retarded in fitness development in general.

A pre-school child may achieve a high level of motor fitness if it is not subject to systematic exercises proper for its development and corresponding to natural interests and needs of a child [2, 3, 4, 5, 6]. Children have an irresistible need of mobility, and everyday they express it in a way impossible to miss. Children associate physical activity with spontaneous, unrestricted movement, which may be changed at any time and adapted to own possibilities. It is a teacher’s task to direct this natural need for movement and to stimulate the child’s development. It should be stressed that motor activities correctly conducted in preschool have an immense influence on arising and forming interests of children in widely understood physical culture. “Movement for a child has an aim in itself; it is direct and unaffected, always soft somehow undefined” [7, p.178]. In this situation the teacher and her/his attitude towards physical activity is particularly important.

Specialists’ research [2, 8, 9] indicated that in the pre-school period intensive development of physical fitness and mastering techniques of performed activities occur. Movements become more precise, economical and purposeful. A pre-schooler has abilities of precise performance of a movement. That is why this period should be used, among others, for creating proper body posture.

It results from the examinations of six- and seven-year-old children conducted for years in the Centre of Health Promotion and Fitness of a Child in Gdansk that there are more and more children with excess fat tissue. Deviations in body built (within shoulder, hip girdle and big joints of upper and lower limbs) are noticed in 73%, and scoliosis of a light degree in 13% of children [10]. Body posture in a pre-schooler undergoes very quick changes. By properly conducted corrective gymnastics, a teacher may correct abnormalities that occur in the body posture. One of the main reasons for incorrect body formation is limiting children’s spontaneous activity.

B. Woynarowska claims that during the period of early childhood, little spontaneity in physical activity of a child is a deviation from normal behaviour and it may be a sign of disturbances of his/her development and health, and limiting spontaneous physical activity can early and permanently stop the need for movement, disturb a child’s development and create risk for his/her life. Such limitations should be treated as a form of motor neglect of a child and in extreme cases of hurting him/her [11]. An appropriate level of physical activity in childhood and youth, and connected with it positive experience, create a chance for physical activity that will last for the whole life.

The recommended level of physical activity for children and youth should take at least 60 min. daily of physical effort of moderate intensity. Activities directed at the development of motor apparatus (as the result of high physical effort) should be taken at least two days a week [12].

According to WHO recommendations, physical activity of children between the 5<sup>th</sup> and the 17<sup>th</sup> year of life should include at least 60 minutes of physical effort daily of average to high intensity. Most of these activities should have a character of aerobic efforts and include activities of maximum intensity, which should last up to 5 minutes, in order to maximise mobilization of the oxygen supply function. Efforts stimulating the development of stamina and muscle strength should appear at least three times a week [5, 13, 14]. An example of a daily “portion” of movement maybe activities during which warming up takes 2-3 minutes, moderate and intensive exercises – 14-15 minutes and at the end, cooling down of the organism – 2-3 minutes [15].

It has been observed that intensified physical effort of a child takes place for at least 5-10 minutes in a run [16]; however, most children take up such effort very infrequently [17]. It results from the fact that a child's activity seldom lasts longer than 5-10 minutes [18, 19], with an advantage of less than 5 minutes [20]. Research showed [21] that children of 6-10 years of age on average proved to be able to perform continuously physical effort lasting 20 seconds [22]. It is an essential indication for preschool teachers, since too long and too simple tasks make children bored easily, and too complicated and hard to complete tasks dishearten them. Demanding care and preciseness, corrective gymnastics, in spite of eliminating jumps, struggling, lifting heavy objects as well as an essential decrease in "administering" runs do not have to be boring. Corrective classes, next to its basic – therapeutic – task, should also educate, entertain and bring up [23]. Daily demand of children for physical activity to a certain degree could satisfy properly planned and conducted extra motor classes in preschools in a form of corrective gymnastics.

The aim of the present research is to assess motor skills of children participating and not participating in extra motor classes on the example of corrective gymnastics. It seems to be natural that children who are subjected to a higher amount of exercises will be fitter than those who do not participate in additional motor classes. That is why it has been assumed that the children participating in additional motor classes conducted in preschool have greater motor skills than the children not participating in this kind of activities.

This research problem will be solved when answers to the following questions will be given:

1. Is the level of motor skills in five- and six-year-old children participating in corrective gymnastics classes higher than of the children who do not participate in this kind of classes?
2. Has there been an improvement in motor skills in five- and six-year-olds after a year lasting participation in corrective gymnastics classes?

## Material and methods

The study was realized in two stages. The first quantitative one, according to the scheme of survey research, within which the method of a diagnostic poll was applied used a questionnaire for preschool headmasters and concerned organization of preschool work and physical activity of preschool children. The research was conducted on a full sample of preschools and in preschool units in primary schools in Gdansk.

Table 1. The number of returned questionnaires relating to the number of institutions in the area of Gdansk

Type of establishment	The total number of facilities	Number of returned questionnaires filled by headmasters
Public preschools	64	54
Nonpublic preschools	19	6
Units in primary schools	68	26
Total	151	86

The second qualitative-quantitative stage was conducted according to the scheme of a case study. Within the research the following techniques were applied: observation of preschool work organisation using an observation sheet concerning physical activity of children in preschool; analysis of documents in form of selected programmes of preschool education, on the basis of which tests of educational achievements had been worked out to control the level of motor skills which a child should acquire during education in preschool.

Tests in the form of exercises were taken from the programmes: "Programme of preschool education for 3-6-year-old children" by H. Czerniawska [24] and "ABC... programme of preschool education of the 21<sup>st</sup> century" by A. Lada-Grodzicka [25].

In the research, particular exercises were assessed by applying a scoring system of 1 to 3 and assuming that a preschooler: 1 – performed an exercise faultlessly (such scoring was applied also

when a slight mistake having no influence on the proper conduct of the test was made), 2 – performed an exercise with big mistake, 3 – failed to perform the exercise.

The research was conducted in 11 facilities: 8 preschools and 3 preschool units in primary schools in Gdansk at the turn of September and October 2007 and May and June 2008. 286 children participated in the research. Four research groups were singled out: 5- and 6-year-olds participating and not participating in corrective gymnastics classes.

Table 2. The number of children participating and not participating in corrective gymnastics

Children participating and not participating in corrective gymnastics			Number of children
yes	5-year-olds		66
	6-year-olds		122
not	5-year-olds		63
	6-year-olds		35
Total			286

Information acquired by means of the questionnaire presented by headmasters was subject to quantitative analysis. The significance of differences between the singled out groups were tested by means of the chi square test, which is a generally applied nonparametric test. In the statistical concluding the value  $p < 0.05$  was assumed as the level of trust [26].

For the assessment of the development of motor skills a nonparametric test was applied for independent tests – a sign test which is applied when there are quantitative data or they may be ordered only according to certain, determined criteria. Every time when it is possible to estimate that the results are rising (or falling), but it is not possible to estimate this growth quantitatively, then the sign test is the only one applicable. This test is based on the signs of differences between the consecutive pairs of results.

As a result of such a test, we determine a number of results in one set, which are smaller than their equivalents in the second set and a number of results that are higher. This way, we learn how much data was shifted in one direction in the second test. If all data were shifted, the test gives a significant result, otherwise the situation is unclear. We can, however, give probabilities linked to all proportions (occurrence of signs +/-) which could happen. Having known the probability of every directional change, we can assess if our results are significant. For measurable data we do not consider the number of differences but only their signs. As a level of significance  $p < 0.05$  was assumed [27].

## Results

In the questionnaire, headmasters were asked to determine the percentage of children with a diagnosed body posture defect. All the headmasters of primary schools claimed that the 0 grades in their schools are attended by children suffering from body posture defects. A similar statement was made by 95% of headmasters of public preschools and 88% of headmasters of independent preschools. About 80% of headmasters of primary schools, 2/3 of public preschools and a bit more than 1/3 of independent preschools were able to determine the percentage of children suffering from faulty posture. Table 3 shows the detailed percentage of children suffering from faulty posture according to the headmasters' statements.

Table 3. The percentage of educational institutions for children at preschool age attended by a specified number of children suffering from faulty posture according to the declarations of headmasters of those institutions

Type of institution	Percentage of educational institutions for children in preschool age attended by children with faulty posture, according to declarations of schoolmasters of these institutions			
	up to $\frac{1}{4}$ of children with congenital posture defect	$\frac{1}{4}$ to $\frac{1}{2}$ of children with congenital posture defect	$\frac{1}{2}$ to $\frac{3}{4}$ of children with congenital posture defect	over $\frac{3}{4}$ of children with congenital posture defect
Nursery school public	11.9%	28.6%	19.0%	4.8%
Nursery school non-public	0.0%	0.0%	12.5%	25.0%
Branches in the pre-primary schools	22.7%	13.6%	22.7%	18.2%

In the questionnaire, the headmasters were also asked to determine the percentage of children practise corrective gymnastics. All the headmasters of primary schools, 98% of headmasters of public preschools and 85% of headmasters of independent preschools claimed that the children attending their institutions participate in corrective gymnastics classes. About 80% of headmasters of primary schools, 72% of public preschools and 58% of independent preschools determined the percentage of children attending corrective exercises (Table 4).

Table 4. The percentage of educational institutions for preschool children where, according to the headmasters' statements, children participate in corrective gymnastics

Type of institution	Percentage of institutions where children participate in corrective gymnastics			
	up to $\frac{1}{4}$ of children participating in corrective gymnastics	$\frac{1}{4}$ to $\frac{1}{2}$ of children participating in corrective gymnastics	$\frac{1}{2}$ to $\frac{3}{4}$ of children participating in corrective gymnastics	over $\frac{3}{4}$ of children participating in corrective gymnastics
Nursery school public	12.2%	36.7%	8.2%	12.2%
Nursery school non-public	0.0%	14.3%	14.3%	14.3%
Branches in the pre-primary schools	18.2%	18.2%	18.2%	22.7%

The comparison of Tables 3 and 4 shows that in some public and nonpublic preschools more children attended corrective exercises than suffered from faulty posture. According to teachers' statements, corrective gymnastics was conducted in 92% of preschools and 96% of preschool branches located in schools. However, at the level of preschool education these classes could be determined as extra curriculum with additional elements of gymnastics and motor games. The effects of corrective exercises were diagnosed by teachers in 56% of preschools and 68% of schools. As a method of diagnosis in preschools, teachers mainly listed control tests run by the teacher of corrective exercises and achievement evaluation sheets of 6-year-old children, while at schools screening and mobility tests. Almost two thirds of teachers claimed that in terms of corrective gymnastics the effects were average, the others claimed that they were high.

In order to carry out in-depth research, one-day observations were made in 11 centers – in 14 groups. Classes of corrective gymnastics were excluded from observation.

Table 5. Corrective gymnastics of children in one of the preschools in the studied group of five- and six-year-olds in the light of observations

Timetable	Type of course	Activities performed by children	Activities performed by the teacher
11:40	Corrective gymnastics in the preschool hall (children change in gym suits).	Only six-year-olds exercise. At this time five-year-olds are playing at their desks. Children are sitting on the carpet. Individually each one draws a card with exercises, which he/she shows to a group. Children have to specify the correct name of the exercise. Children get bored.	Gymnastics is conducted by an external teacher. The teacher is sitting on the carpet all the time.

Table 6. Corrective gymnastics of children in one of the preschools in the group of six-year-olds in the light of observations

Timetable	Type of course	Activities performed by children	Activities performed by the teacher
9:00	Children change into gym suits for corrective gymnastics.	Children change by the chairs. Dressed children are sitting in two rows.	A teacher is sitting at her desk.
9:10	Corrective gymnastics.  Test on celebrating the end of the school year.	Children with the teacher are moving to the gym for physical activities. The children have been divided into 2 groups, boys play "a game of tag", "bricklayer", then overcome an obstacle. The girls at this time are having test at the end of the school year.	Gymnastics is conduct by an external teacher .She is yelling at the children. Girls are crying.

Table 7. Corrective gymnastics of children in the mixed group of five- and six-year-olds in the light of observations

Timetable	Type of course	Activities performed by children	Activities performed by the teacher
12:00	Lunch	Two children on duty serve meals to other children	The teacher feeds one of the children, she speeds the children up to eat quickly and change for corrective gymnastics.
12:15	Children change for corrective gymnastics	Six-year-olds change, five-year-olds take their cushions and lie down on the floor.	The teacher sits at her desk.
12:20	Change of the teacher		
12:20	Corrective gymnastics	Five-year-olds lie on the floor after lunch. Six-year-olds participate in the activities with corrective exercises. "Flies are flying", "dwarves and giants"; while sitting the children exercise feet.	Gymnastics is conducted by an external teacher. The teacher is sitting all the time on the bench.



Observations show that gymnastic exercises were conducted at a very low level. Lack of the teacher's involvement was easily noticed. In one of the cases the exercises were not prepared and not well thought out; they were even "boring" as the children in another preschool described. After telling the children what to do, the teacher was inactive. The children were surmounting an obstacle course on their own, because the teacher focused on rehearsal to celebrate the end of the school year. In the last preschool children played a few games, but the teacher's attitude was confusing, since she was sitting on the bench only telling the children what to do.

In order to examine the differences in motor skills of children participating and not participating in extra-curricular activities, exercises prepared on the basis of pre-school education programmes were applied: I. Walking along an overturned bench; II. Crawling on all fours along a diagonally placed gymnastic bench; III. Running and jumping over an obstacle with one-leg take-off; IV. Catching and throwing a ball over an obstacle; V. Throwing a ball against a wall and catching it; VI. Climbing the ladders hanging on the walls; VII. rope skipping. The research was carried out at the beginning and the end of the school year.

Among five-year-old children not attending extra activities of corrective gymnastics after a year-long education in preschool, an improvement in the level of the performed motor skill exercises occurred in five tests: II – climbing the wall-ladder (Fig. 1), III – crawling on all fours along the diagonally placed gymnastic bench, (Fig. 3), IV – running with jumping over an obstacle (Fig. 4), V – catching and throwing the ball over an obstacle (Fig. 5) and VI – throwing the ball against the wall and catching it (Fig. 6).

Among five-year-old children attending extra classes after a year of education in preschool, an improvement in the level of motor skills of the performed exercise occurred in four attempts: I – walking on a balance bench (Fig. 1), II – climbing a gymnastics ladder (Fig. 2), IV – running and jumping over an obstacle with one leg (Fig. 4) and VI – throwing a ball against a wall and catching it (Fig. 6).

Table 8. The results of the sign test for 5-year-old children participating and non-participating in the activities of corrective gymnastics

Type of test	Participating (yes) or non- participating (not)	Number of non- zero differences	The proportion of cases with improvement	The value of the sign test	The significance level p
I. Walking on an overturned balance bench - Test 2 & Test 1	yes	20	70.00	1.57	p>0.05
	not	31	41.94	0.72	p>0.05
II. Climbing a gymnastic ladder - Test 2 & Test 1	yes	14	64.29	0.80	p>0.05
	not	19	68.42	1.38	p>0.05
III. Crawling on a diagonally placed gymnastic bench – Test 2 & Test 1	yes	5	80.00	0.89	p>0.05
	not	7	85.71	1.52	p>0.05
IV. Running and jumping over an obstacle with one-leg take-off – Test 2 & Test 1	yes	9	100.00	2.67	<b>p&lt;0.05</b>
	not	6	100.00	2.04	<b>p&lt;0.05</b>
V. Catching and throwing a ball over an obstacle – Test 2 & Test 1	yes	25	44.00	0.40	p>0.05
	not	24	66.67	1.43	p>0.05
VI. Throwing a ball against a wall and catching it – Test 2 & Test 1	yes	28	89.29	3.97	<b>p&lt;0.05</b>
	not	22	81.82	2.77	<b>p&lt;0.05</b>
VII. Rope skipping – Test 2 & Test 1	yes	3	66.67	-0.00	p>0.05
	not	1	-	-	p>0.05

Among six-year-old children attending corrective gymnastics in the first study, the level of motor skills was higher than among children not participating in the activities of corrective gymnastics only in test VI – throwing a ball against a wall and catching it. In the second study, after one year's education, a higher level of motor skills of children attending corrective gymnastics remained in the same test.

An improvement in motor skills in six-year-old children attending corrective gymnastics occurred in four tests: III – crawling on all fours along a diagonally placed gymnastic bench (Table 9, Fig. 3), IV – running and jumping over an obstacle with one-leg take-off (Table 9, Fig. 4), VI – throwing a ball against a wall and catching it (Table 9, Fig. 6) and VII – rope skipping (Table 9, Fig. 7). In the remaining tests (Table 9, Fig. 1, 2, 5) the children's skills in the first and in the second study were at a similar level.

Table 9. The results of the sign test for 6-year-old children participating and non-participating in the activities of corrective gymnastics

Type of test	Participating (yes) or non- participating (not)	Number of non- zero differences	The proportion of cases with improvement	The value of the sign test	The significance level p
I. Walking on an overturned balance bench - Test 2 & Test 1	yes	31	67.74	1.80	p>0.05
	not	12	50.00	-0.29	p>0.05
II. Climbing a gymnastic ladder - Test 2 & Test 1	yes	28	46.43	0.19	p>0.05
	not	12	75.00	1.44	p>0.05
III. Crawling on a diagonally placed gymnastic bench – Test 2 & Test 1	yes	8	100.00	2.47	<b>p&lt;0.05</b>
	not	2	100.00	0.71	p>0.05
IV. Running and jumping over an obstacle with one-leg take-off – Test 2 & Test 1	yes	12	100.00	3.17	<b>p&lt;0.05</b>
	not	3	100.00	1.15	p>0.05
V. Catching and throwing a ball over an obstacle – Test 2 & Test 1	yes	56	44.64	0.67	p>0.05
	not	15	60.00	0.51	p>0.05
VI. Throwing a ball against a wall and catching it – Test 2 & Test 1	yes	61	91.80	6.40	<b>p&lt;0.05</b>
	not	17	52.94	0.00	p>0.05
VII. Rope skipping – Test 2 & Test 1	yes	18	83.33	2.59	<b>p&lt;0.05</b>
	not	5	100.00	1.79	p>0.05

In cases of six-year-old children both not attending and attending extra classes of corrective gymnastics, an improvement in the motor skills level of the performed exercises happened in four tests – among non-attending children in tests: II – climbing a gymnastic ladder (Fig. 2), IV – running and jumping over an obstacle with one-leg take-off (Fig. 4), V – catching and throwing a ball over an obstacle (Fig. 5) and VII – rope skipping (Fig. 7); among attending children in tests: I – walking on a balance bench (Fig. 1), IV – running and jumping over an obstacle with one-leg take-off (Fig. 4), VI – throwing a ball against a wall and catching it (Fig. 6) and VII – rope skipping (Fig. 7).

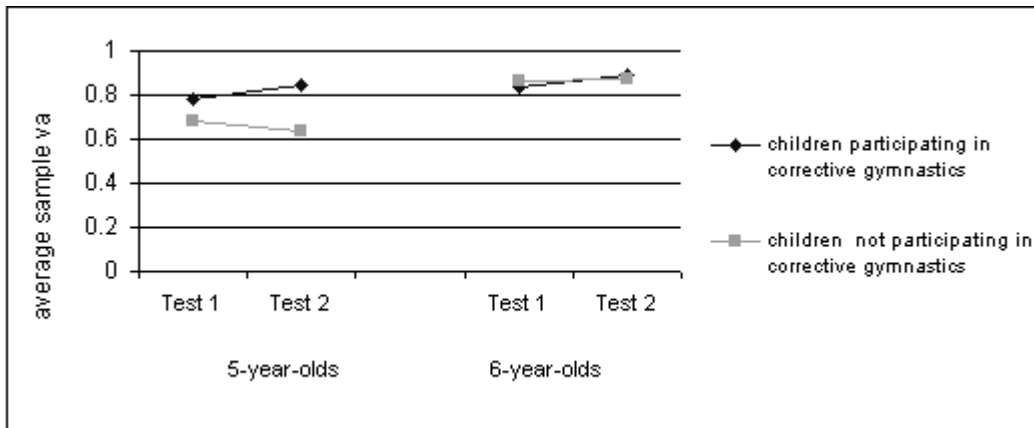


Fig. 1. Test results of “walking on an overturned balance bench” in the initial test (Test 1) and the final one (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

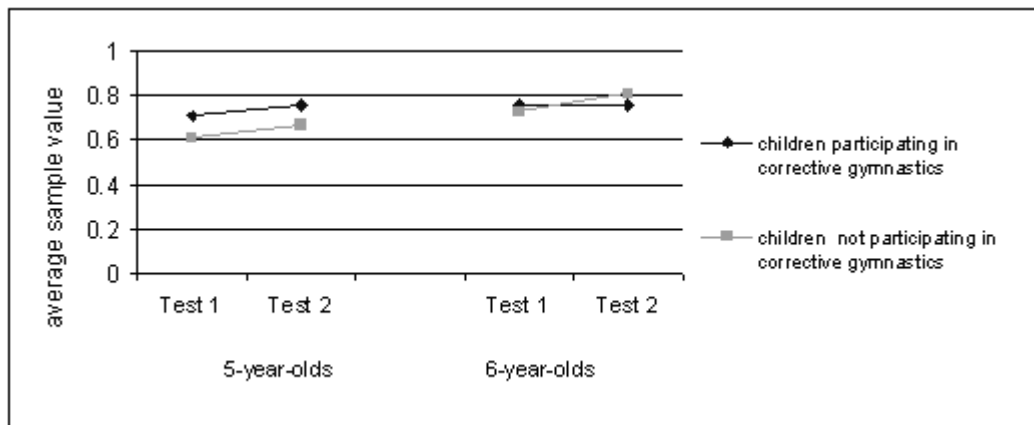


Fig. 2. Test results of climbing a gymnastics ladder in the initial test (Test 1) and in the final test (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

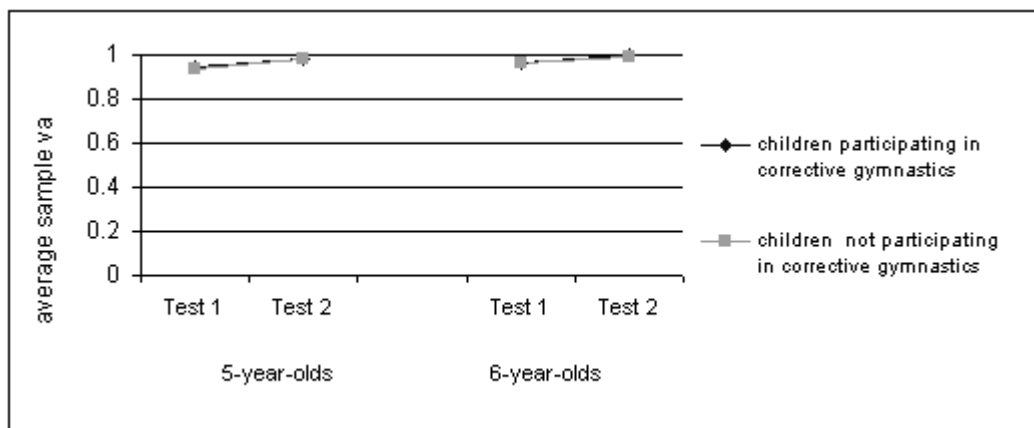


Fig. 3. Test results of “crawling on all four along the diagonally placed gymnastic bench in the initial test (Test 1) and the final test (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

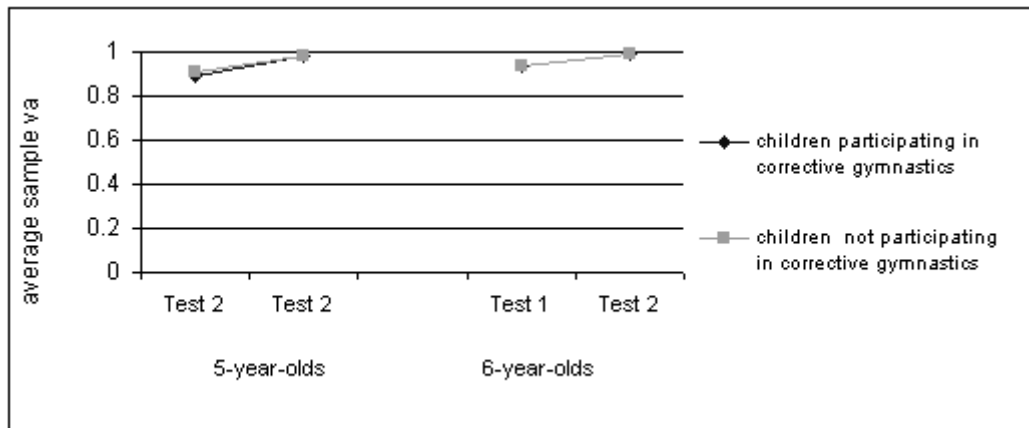


Fig. 4. Test results of running and jumping over an obstacle with one-leg take-off in the initial test (Test 1) and the final test (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

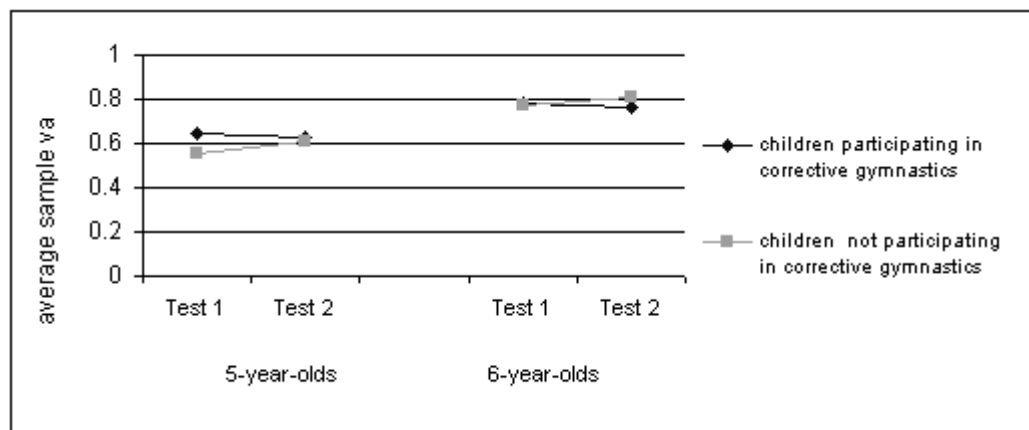


Fig. 5. Test results of catching and throwing a ball over an obstacle in the initial test (Test 1) and in the final test (Test 2) of 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

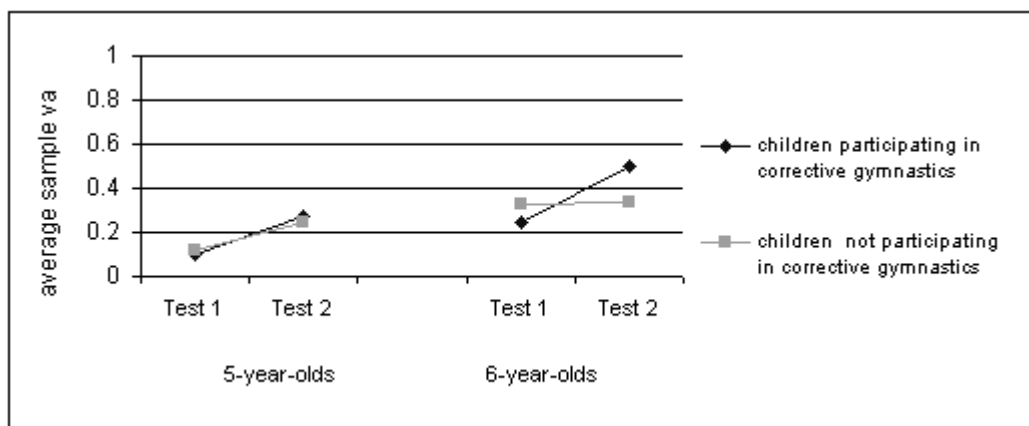


Fig. 6. Test results of throwing a ball against a wall and catching it the initial test (Test 1) and the final test (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

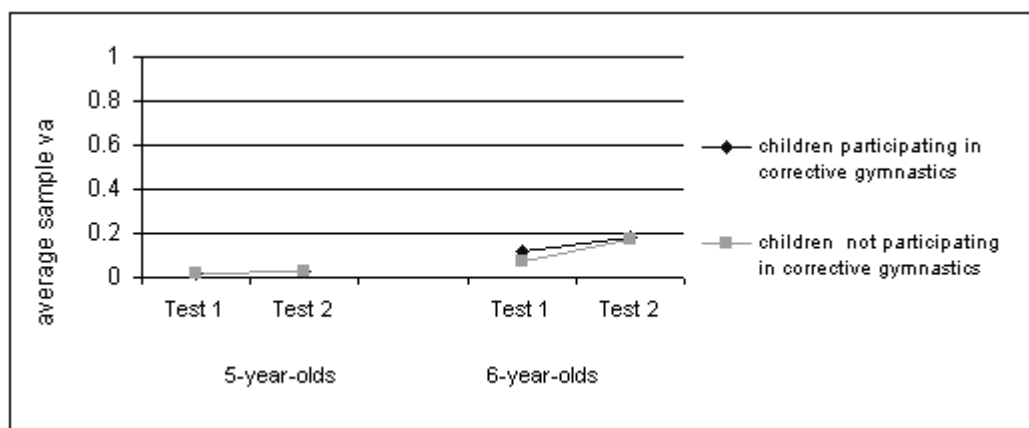


Fig. 7. Test results of rope skipping in the initial test (Test 1) and the final test (Test 2) for 5-year-old and 6-year-old children participating and not participating in corrective gymnastics classes

## Discussion

From the headmasters' declarations it can be concluded that children with faulty body posture attend all the tested preschool units in primary schools and almost all the researched preschools. From these declarations we also learn that more children participated in corrective gymnastic classes than there were children with faulty posture. What kind of exercises do those children need? Do preschools really care so much about children's body posture? During the whole-day observation no instance of the teacher drawing children's attention to behaviours connected with keeping proper body posture was noted.

From Bierzgalska and Patyk's study we can conclude that in a preschool of an increased number of motor activities children happen to show fewer cases of body statics disturbances and we observe a higher level of physical fitness [28]. While comparing groups of preschoolers participating and not participating in corrective gymnastics classes, among five-year-olds attending classes of corrective gymnastics higher skills can be noticed only in two tests: I – walking on an overturned bench and II – climbing a wall ladder, and among six-year-olds only in one test – VI – throwing a ball against the wall and catching it.

In the other tests skills that children present are at a similar level. Thus arises a question concerning "educational myths", with reference to classes in preschools called corrective gymnastics. What is the function of corrective gymnastics in preschools? Is corrective gymnastics appropriately run by teachers? Maybe due to the contents of these classes the name "corrective gymnastics" should be abandoned? Should we employ teachers from outside (in all preschools corrective gymnastics was run by external teachers) if the observations prove that in most cases the classes were conducted at a very low level. Trzcinska comes to a similar conclusion in her research claiming that "the notion 'corrective gymnastics' in preschool should be understood in a conventional way and not literally – as in older children. Correctiveness in the proper meaning of this word demands high accuracy and precision of movements realized to a great extent by exercising in an accurate way. We cannot fully execute and prefer this form in preschoolers for whom it would be incompatible with their psychophysical needs" [29]. At the same time Trzcinska indicates motor and other games enriched by elements of corrective gymnastics as the most proper form of "organised" physical activity [29].

On the grounds of their research concerning body language of children and youth, Olszewska and Trzcinska conclude that activities undertaken by school institutions are insufficient for prevention and correction of faulty body posture. Results from these observations confirm that, in fact, corrective gymnastics in preschools is not realized with the teacher's proper engagement and preparation [30]. Corrective gymnastics is not obligatory. Most facilities accepted the rule of conducting free classes for six-year-old children, while other children may participate in the classes after presenting certificate issued by a specialist medical doctor confirming faulty body posture. Rogowska in her research emphasizes that bad body posture in six-year-olds is a very frequent

phenomenon. Proper and early diagnosis, appropriately conducted corrective therapy and cooperation of children, parents, teachers and doctors may influence their fast correction [31]. However, carelessness in performing corrective exercises and taking on by a child careless body posture can cause just the opposite than the intended effect. Research of many Polish authors [32, 33, 34, 35, 36] indicates a frequent occurrence of deviations in body posture in the examined five- and six-year-old children. Therefore, noticing by the teacher those mistakes unconsciously made by a child creates a possibility of their systematic and consistent eliminating. Following observations of Olszewska and Trzcinska on providing children in puberty with movement directed to forming habits of good body posture, also children in an such important period deciding of later developmental effects should regularly undertake such a form of physical activity (as obligatory classes in preschools and then in schools).

*Nobody is born for the second time  
What we don't do for kids, for pre-school education now  
We'll never do it again later  
Stimulating development of child is easier than counting future defects...*  
(Prof. Maria Kielar-Turska)

## Conclusions

A comparison of information according to the headmasters' declarations indicates that in some public and non-public preschools more children participated in classes of corrective gymnastics than there were children with bad body posture. An improvement in the level of motor skills was observed in a similar number of tests both in five- and six-year-old children participating in additional activities, and therefore we can conclude that participation in such classes as corrective gymnastics will not contribute to developing new motor abilities of preschoolers. We can look for reasons in badly organised activities, but at the same time we should remember that a child acquires these skills in due time.

Nevertheless, observation of classes shows that in educational practice corrective gymnastics is conducted at a low level. Teachers take on a passive attitude, they do not use gym equipment, they do not get prepared properly to run their lessons and at the same time they prevent the children from acquiring new skills.

## References

1. Bogdanowicz J. Rozwoj fizyczny dziecka [Physical development of the child] Warszawa: Instytut Wydawniczy „Nasza Księgarnia”; 1948. Polish.
2. Przeweda R. Rozwoj somatyczny i motoryczny [Somatic & motoric develop.]. Warszawa: WSiP; 1981. Polish.
3. Osinski W. Antropomotoryka [Anthropomotorics]. Poznan: AWF; 2003. Polish.
4. Hurlock EB. Rozwoj dziecka [Child development]. Warszawa: PWN; 1985. Polish.
5. Woynarowska B. Edukacja zdrowotna [Health education]. Warszawa: PWN; 2008. Polish.
6. Chrzanowska D, Dzieniszewska-Klepicka L, Kurniewicz-Witczakowa R, Witkowska S. Dziecko w wieku przedszkolnym [A child in preschool]. Warszawa: PZWL; 1978. Polish.
7. Gilewicz Z. Teoria wychowania fizycznego [Theory of physical education]. Warszawa: Sport i Turystyka; 1964. Polish.
8. Przetacznikowa M, Makiello-Jarza G. Psychologia rozwojowa [Developmental psychology] Warszawa: WSiP; 1977. Polish.
9. Wolanski N. Rozwoj biologiczny człowieka [Human biological development]. Warszawa: PWN; 1983. Polish.
10. Drabik J. Aktywnosc fizyczna w edukacji zdrowotnej społeczeństwa, cz. 1 [Physical activity in public health education. Part 1]. Gdansk: AWF; 1995. Polish.
11. Woynarowska B. Aktywnosc ruchowa w profilaktyce zaburzen rozwoju i zdrowia u dzieci i młodzieży [Physical activity in prevention of children's and teenager's health and development disorders]. *Medicina Sportiva*. 1997;1(2):75-81. Polish.
12. At least five a week: Evidence on the impact of physical activity and its relationship to health. A report from the Chief Medical Officer. London: Department of Health; 2004, 3.
13. Global Recommendations on Physical Activity for Health. WHO; 2010.
14. Directive of EU on physical activity. Brussels; 2008.
15. Daily Physical Activity in Schools. Guide for School Principals. Ontario; 2006.

16. Health Canada and the Canadian Society for Exercise Physiology. Canada's physical activity guide for youth. Cat. No. H39-611/2002-IE. Ottawa, Ont.: Minister of Public Works and Government Services Canada; 2002.
17. Corbin CB, Pangrazi RP. Physical activity for children: a statement of guidelines for children aged 5-12, 2nd ed. Reston: National Association for Sport and Physical Education; 2004.
18. Baranowski T, Hooks P, Tsong Y, Cieslik C, Nader PR. Aerobic physical activity among third- to sixth-grade children. *J Dev Behav Pediatr.* 1987;8:203-206.
19. Trost SG, Pate RR, Sallis JF, Freedson PS, Taylor WC, Dowda M, Sirard J. Age and gender differences in objectively measured physical activity in youth. *Med Sci Sports Exerc.* 2002;34:350-355.
20. Rowlands AV, Pilgrim EL, Eston RG. Patterns of habitual activity across weekdays and weekend days in 9-11-year-old children. *Prev Med.* 2008;46:317-324.
21. Bailey RC, Olson J, Pepper SL, Porszasz J, Barstow TJ, Cooper DM. The level and tempo of children's physical activities: an observational study. *Med Sci Sports Exerc.* 1995;27:1033-1041.
22. Berman N, Bailey R, Barstow TJ, Cooper DM. Spectral and bout detection analysis of physical activity patterns in healthy, prepubertal boys and girls. *Am J Human Biol.* 1998;10:289-297.
23. Olszewska E, Trzcinska O. Korektywa coraz bardziej potrzebna [Corrective more and more necessary]. In: Zukowska Z, Zukowski R, eds. *Wychowanie poprzez sport [Education through sport]*. Warszawa: MENiS; 2003, 146-151. Polish.
24. Czerniawska H. Program wychowania przedszkolnego dla dzieci 3-6 letnich [Preschool education program for children 3-6 year]. Warszawa: GRAF-PUNKT; 2002. Polish.
25. Lada-Grodzicka A, Belczewska E, Herde M, Kwiatkowska E, Wasilewska J. ABC... Program wychowania przedszkolnego XXI wieku [ABC... Preschool education program XXI century]. Warszawa: WSiP; 2000. Polish.
26. Stanisław A. Przystępny kurs statystyki w oparciu o program STATISTICA PL na przykładach z medycyny [Affordable rate statistics based on the program STATISTICA PL examples of medicine]. Kraków: Stat-Soft Polska; 2001. Polish.
27. Stanisław A. Testy nieparametryczne [Nonparametric tests – p. 2]. *Medycyna Praktyczna.* 2007;1999:10. [<http://www.mp.pl/artykuly/?aid=10819>, 05.02.2011]. Polish.
28. Bierzgalska L, Patyk Z. Wpływ zwiększonej aktywności ruchowej na postawę dzieci w wieku przedszkolnym [Effect of increased physical activity on the attitude of preschool children]. *Scientific Yearbook, Volume XIV.* Kraków: AWF; 1979. Polish.
29. Trzcinska D. Gimnastyka korekcyjna w przedszkolu [Corrective gymnastics in preschool]. *Wychowanie Fizyczne i Zdrowotne.* 1999;4:149-153. Polish.
30. Olszewska E, Trzcinska D. Postawa ciała dzieci i młodzieży w różnych okresach rozwojowych [The posture of children and young people in different periods of development]. In: Gorniak K, editor. *Korektywa i kompensacja zaburzeń w rozwoju fizycznym dzieci i młodzieży. t. II [Corrective and compensation disturbances in physical development of children and youth, vol. 2]*. Białą Podlaska: AWF; 2005, 66-75. Polish.
31. Rogowska E. Postawa ciała dzieci w wieku przedszkolnym [Body posture preschool children]. In: Gorniak K, editor. *Korektywa i kompensacja zaburzeń w rozwoju fizycznym dzieci i młodzieży. t. II [Corrective and compensation disturbances in physical development of children and youth, vol. 2]*. Białą Podlaska: AWF; 2005, 83-89. Polish.
32. Krol-Zielinska M. Postawa dzieci w wieku 6 lat z przedszkoli Poznania [The attitude of children aged 6 years from preschools of Poznań]. *Scientific Yearbook No 1.* Poznań: AWF; 1998. Polish.
33. Lichota G, Gorniak K, Kedra A. Częstość występowania nieprawidłowości postawy ciała u 5-6-letnich dzieci [Frequency of body posture defects occurrence in body posture in 5-6 year old children]. In: Gorniak K, editor. *Korektywa i kompensacja zaburzeń w rozwoju fizycznym dzieci i młodzieży. t. II [Corrective and compensation disturbances in physical development of children and youth, vol. 2]*. Białą Podlaska: AWF; 2005, 179-191. Polish.
34. Lizis P, Zak M, Calka-Lizis T, Jankowicz W. Postawa ciała oraz jej związki z wybranymi cechami morfologicznymi u dziewczynek z Nowej Huty [The attitude of the body and its relationship with selected morphological features in girls from Nowa Huta]. *Postępy Rehabilitacji.* 1997;11(3):133-139. Polish.
35. Suder A, Kosciak T, Palosz J. Częstość występowania wad postawy ciała chłopców krakowskich wieku od 4 do 18 lat – stan aktualny i zmiany w ostatnim trzydziestoleciu [The incidence of postural defects Krakow boys aged 4 to 18 years – current status and changes in the last three decades]. *Pediatrica Polska.* 2003;2. Polish.
36. Pretkiewicz-Abacjew E, Zeyland-Malawka E. Objawy asymetrii w postawie ciała młodszych dzieci szkolnych [Symptoms of asymmetry in body posture of school children]. In: Slezynski J, editor. *Postawa ciała człowieka i metody jej oceny [Body posture of a man and methods of its assessment]*. Katowice: AWF; 1992, 175-179. Polish.