DOI: 10.2478/tperj-2018-0009

Contribution of harmonious physical development exercises to increase bio-motor process at preschool children

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Abstract

Introduction: A child turns into a well-defined personality after a long educational process based on a curriculum, a process that is the first step on a learning path. The kindergarten, as Florinda Golu states, is "the first institution that ensures an intense learning process through a methodic activity framed in a play, effort, and interrelation regimen. This leads to acquisitions and progress in the cognitive, affective and psychomotor fields of a pre-school child". [6, pg.140]
The aim of this paper is to amend the instructive and educational process at pre-school level by developing the psychomotor activities/physical education (PE) lessons through using the physical exercises as a main resort for a harmonious physical development.
Materials and methods: The experiment took place at the P.P. no.9 Kindergarten during the 2015-2016 school year, and included 30 children from the upper preschool group, 17 girls and 13 boys, aged 5-6. The test used included the following: somatic evaluation and motricity evaluation.
Results: After applying the motricity evaluation content proposed in the paper, and after the initial and final testing (five motricity tests), we were able to see an amendment in the indices we tested for, and through direct observation we detected a "self-overcoming" will power in the children. These aspects validate the proposed hypothesis.
Conclusions: The progress was materialized in: number of repetitions, centimeters, and number of points scored – they further strengthened our determination that balanced physical development exercises at this age (5-6) have a positive influence on the correct posture of children, that they make up the basis of general movement, and that they enhance the values of motricity indexes.

***Key words**: physical exercise, motricity evaluation, age 5-6*

Rezumat

Introducere: Copilul devine o personalitate în urma unui lung proces educaţional realizat pe baza unui curriculum care reprezintă un prim pas pe drumul învăţării iar grădiniţa este cum susţine Florinda Golu „ prima instituţie care asigură intensificarea învăţării printr-o activitate ordonată încadrată într-un regim de joacă, efort şi relaţionare, aceasta conduce la achiziţii şi progrese în sfera: cognitivă, afectivă şi psihomotorie a preşcolarului." [6, pg.140]
Scopul lucrării îl reprezintă ameliorarea procesului instructiv – educativ la nivelul învăţământului preşcolar prin realizarea efectivă a activităţilor psiho-motorii/lecţiilor de educaţie fizică folosind ca mijloc principal exerciţiul fizic sub forma complexelor de dezvoltare fizică armonioasă.
Material şi metodă: Experimentul s-a desfăşurat la Grădiniţa P.P.nr.9 din Timişoara în anul şcolar 2015-2016, grupa la care s-a realizat studiul a fost grupa mare ce a cuprins 30 de copii din care 17 fete şi 13 băieţi cu vârste între 5-6 ani.
Bateria de teste utilizate a cuprins: evaluare somatică şi evaluare motrică.
Rezultate: În urma aplicării conţinutului motric propus în lucrare şi a realizării testărilor iniţiale şi finale la cele şase probe motrice am înregistrat o ameliorare a indicilor aptitudinilor testate, iar prin observaţiile directe am constatat dorinţa copiilor de a se autodepăşii. Aceste aspecte validează ipoteza propusă.

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Concluzii: Progresul realizat şi concretizat în: număr de repetări, centimetri, puncte realizate, ne întăreşte convingerea că exerciţiile de dezvoltare fizică armonioasă la această vârstă (5-6 ani) influenţează pozitiv ţinuta corectă şi estetică a copiilor, formează bazele generale ale mişcării, determină o îmbunătăţire a valorilor indicilor aptitudinilor motrice.

***Cuvinte cheie**: exerciţiu fizic, evaluare motrică, vârsta 5-6 ani.*

Introduction

A harmonious balanced physical development, as well as the health status of a child cannot remain indifferent to the family or to the society that the child is constantly dependent of.

The environment and the current life-style gradually led to diminished natural and spontaneous movement of children, as they usually spends most of their time in enclosed and small spaces, and they lack spaces that are adequate for playing or walking.

At the present day an early education is in question, a concept that refers to a pedagogical approach that covers the interval between birth and 6/7 years of age.

A child turns into a well-defined personality after a long educational process based on a curriculum, a process that is the first step on a learning path. The kindergarten, as Florinda Golu [6] states, is "the first institution that ensures an intense learning process through a methodic activity framed in a play, effort, and interrelation regimen. This leads to acquisitions and progress in the cognitive, affective and psychomotor fields of a pre-school child".

An optimal physical development includes: an ideal physique (muscles, bones) adequate for the well balanced growth according to age and gender, the conditioning of the organism, muscle strengthening, joint elasticity, and, most importantly the development of the cardiovascular and respiratory functions.

At the preschool age the child has a sustained motor activity that most of the time resides in playing activities. Motor skills start to take shape, both the basic paths and the utilitarian-applicative paths. At the age 5-6 muscular tone increases; the endurance for big and prolonged efforts increases; the walking is corrected and the flight phase is shaped during running [1, 2, 4, 5].

The precision in movement is increased (fine motor skills, complex and assured) and balance is enhanced. During the preschool phase continues the development of fine differentiation when training the structures of the brain cortex, mosaic arrangement of the parts of speech, and the asymmetric dominance of a certain brain hemisphere (usually the left one), a fact that determines the right trait, left trait or ambidexterity [8].

The motor activities are an external factor that condition the growth and physical development processes. Psychomotor activities are not just a good way of spending energy and a fun time for children, but also a way of maintaining a good health status, of preventing obesity and of efficiently handling intellectual activities [1, 9, 10].

General physical development exercises are an ensemble of natural movements or specially designed movements that aim at increasing tonicity and trophicity, strengthening of joints or of the whole body, improving the respiratory and cardiovascular apparatus, the nervous system, and the metabolic and energetic systems [3, 7].

Aim of the research

The aim of this paper is to amend the instructive and educational process at pre-school level by developing the psychomotor activities/physical education (PE) lessons through using the physical exercises as a main resort for a balanced physical development.

Research hypothesis

This paper suggests studying the level of physical and motricity development of preschool children (aged 5-6), an age when most of the children are institutionalized.

If during mandatory and elective activities one uses a variety of harmonious physical development exercises, certain motricity indices can be enhanced and a correct posture and aesthetics of the body can be formed.

Materials and methods

The present research is based on a pedagogical trial, that was both observant and ameliorative, that was carried out at the P.P. no.9 Kindergarten in Timisoara, during the 2015-2016 school year; it included 30 upper preschool group children, 17 girls and 13 boys, aged 5-6, with the amendment that in the second semester 2 of the 13 boys left the study group.

The evaluation consisted of somatic evaluation (height and weight) and motor evaluation that included: abdominal muscle strength, lower limb muscle strength, anterior coxo-femoral mobility, precision movement, and explosive strength in the upper limbs.

The tests were chosen bearing in mind the fact that these preschoolers will enter the preparatory class starting from September 2016, becoming pupils and studying PE as a school subject.

For the 1st class, there are motricity evaluation tests proposed by the National School System, tests that are similar to the ones we propose in the current paper. One of the tests includes memorizing a set of balanced physical development exercises, with free exercises that they do with music.

Between the initial and final testing we applied a content materialized through free harmonious physical development exercises or exercises performed while using certain objects (circle, baton). The exercises chosen are simple and include 2-3 motricity acts that are performed simultaneously, symmetrically, both on the right and on the left side. We used exercises with both in 4 and 8 times.

The number of repetitions increased progressively in order to have a positive influence on the children's organism, and to develop their motor memory and concentration power.

We also introduced exercises for rhythm education through percussion using body parts or different objects.

Results

By analyzing the results obtained for the girls' group (G) we determined the following:

At Ti (initial testing) the arithmetic mean for the height of the girls was 116.5 cm, while at Tf (final testing) $\bar{x}$ =120.1 cm, values that are in the normal range for the 5-6 years old group. The variability coefficient values (CV) (5.41% and 5.40%) include the girls in a homogenous group with a small scatter of the data.

Regarding the weight we can confirm the following: at Ti. - $\bar{x}$ =19.41 kg in comparison to Tf - $\bar{x}$ = 21.06 kg. The arithmetic mean increased for the parameter as well, and the values we obtained are the normal values for the analyzed age group. The variability coefficient – CV (18.22%, 19.03%) indicates that the group is relatively homogenous, with a moderate data scatter. The increase observed in these parameters is natural for this age group and contribute to the normal growth and development phenomena.

By analyzing the results obtained for the boys' group (B) we determined the following:

At Ti the arithmetic mean for the height of the girls was 116.8 cm, while at Tf $\bar{x}$ =120.3 cm, values that are in the normal range for the 5-6 years old group. The variability coefficient values (CV) (5.63% and 5.70%) include the girls in a homogenous group with a small scatter of the data.

Regarding the weight we can confirm the following: at Ti. - $\bar{x}$ =20 kg in comparison to Tf - $\bar{x}$ = 23 kg. The arithmetic mean increased for this parameter as well, and the values we obtained are the normal values for the analyzed age group. The variability coefficient – CV (15.28%, 14.42%) indicates that the group is relatively homogenous, with a moderate data scatter.

The increase observed in these parameters is natural for this age group and contribute to the normal growth and development phenomena. There are no statistically significant differences between the two analyzed groups (Figure 1 and Figure 2).

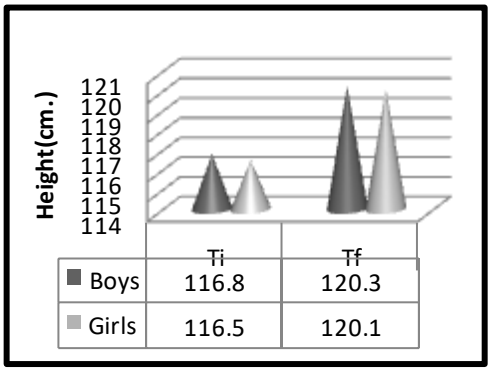

Figure 1. Mean value distribution for height in comparison for B-G, Ti-Tf

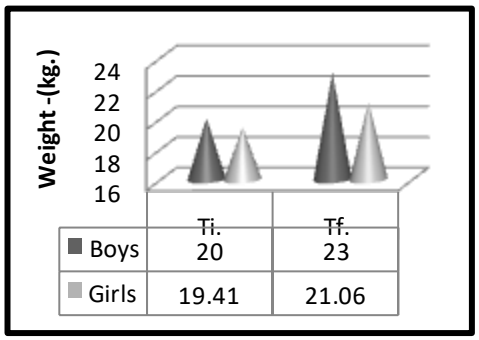

Figure 2. Mean value distribution for weight in comparison for B-G, Ti-Tf

Interpretation for the motricity tests' results

- ***P1. Straight legs lift ° from dorsal recumbent position***

The results obtained for the 13 boys included in the study group are presented in Figure 3:

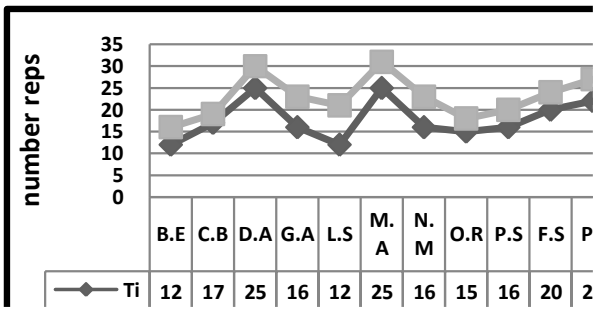

Figure 3. Individual value distribution for P1 – boys

- For Ti - $\bar{x}$ = 17.69 reps and for Tf - $\bar{x}$= 22.31 reps, a progress of 4.62 reps.
- CV for Ti and Tf. (23.91%, 20.9%) indicates a inhomogeneous group with a moderate data scatter. As individual values: from 13 subjects – 12 boys (92.3%) showed progress with 2-9 reps, and one child came to a standstill (7.7%).

The results obtained for the 17 girls included in the study group are presented in Figure 4:

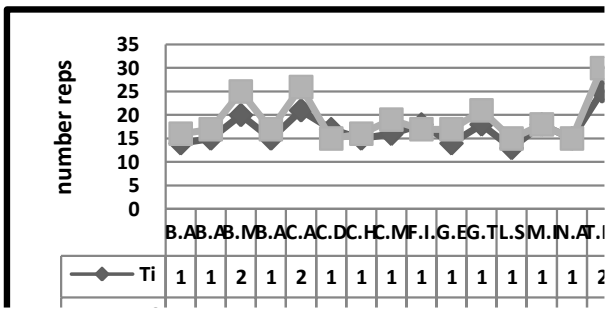

Figure 4. Individual value distribution for P1 – girls

- For Ti - $\bar{x}$ = 16.82 reps and for Tf - $\bar{x}$= 18.76 reps, a progress of 1.94 reps.
- CV for Ti – 17.98% indicates a homogeneous group with a moderate data scatter and Tf – 23.42% - an inhomogeneous group with moderate data scatter. As for individual values: from 17 subjects – 12 girls (70.5%) showed progress with 1-5 reps, 3 girls came to a standstill (7.7%), 2 girls fell back.

When comparing the results of boys and girls we can state that: at Ti both boys and girls have similar mean values (17.69/16.82) with a difference of 0.87 reps in favor of the boys' group. At Tf the boys show a slight progress in comparison with the girls, of 4.62 reps, while the girls' progress was only 1.94 reps. The difference between boys and girls was 2.68 reps, with a better outcome for the boys' group.

- ***P2. - Squats – reps/30"***

The results obtained for the 13 boys included in the study group are presented in Figure 5:

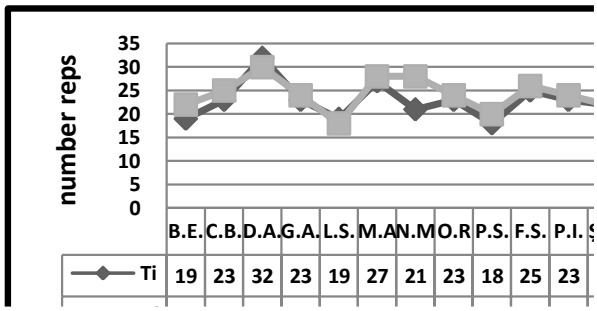

Figure 5. Individual value distribution for P2 – boys

- For Ti - $\bar{x}$ = 23.08 reps and for Tf - $\bar{x}$= 24.38 reps, a progress of 1.30 reps.
- CV for Ti and Tf. (16.16%, 13.76%) indicates a relatively homogeneous group with a moderate data scatter for Ti and a low data scatter for Tf. As individual values: from 13 subjects – 10 boys (76.92%) showed progress with 1-7 reps, one child came to a standstill (7.7%), and 2 fell back (15.38%).

The results obtained for the 17 girls included in the study group are presented in Figure 6:

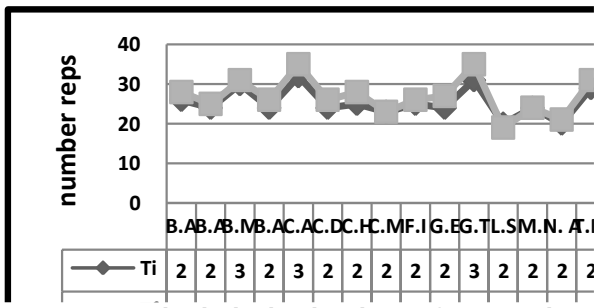

Figure 6. Individual value distribution for P2 – girls

- For Ti - $\bar{x}$ = 25.06 reps and for Tf - $\bar{x}$= 26.76 reps, a progress of 1.70 reps.
- CV for Ti – 14.07% indicates a homogeneous group with a low data scatters and Tf – 16.26% - a relatively homogeneous group with moderate data scatter. As for individual values: from 17 subjects – 14 girls (82.3%) showed progress with 1-4 reps, 2 girls came to a standstill (11.7%), and 1 girl fell back.

Comparing the results of boys and girls we determined that in the second test, girls (25.06 reps) performed better at Ti than boys (23.08 reps), an advantage that can also be seen at the final testing – 26.76 reps for the girls and 24.38 reps for the boys.

- ***P3. Trunk lift test from recumbent position – 30"***

The results obtained for the 13 boys included in the study group are presented in Figure 7:

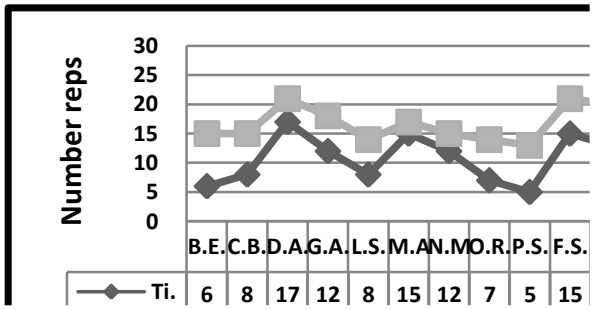

Figure 7. Individual value distribution for P3 – boys

- For Ti - $\bar{x}$ = 11.77 reps and for Tf - $\bar{x}$= 17.54 reps, a progress of 5.77 reps.
- CV for Ti and Tf. (50.53%, 58.61%) indicates an inhomogeneous group with a moderate data scatter. As individual values: all 13 subjects – showed progress with 1-9 reps.

The results obtained by the 17 girls included in the study group are presented in Figure 8:

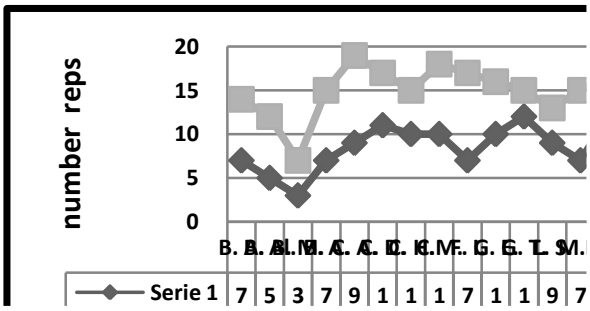

Figure 8. Individual value distribution for P3 – girls

- For Ti - $\bar{x}$ = 8.47 reps and for Tf - $\bar{x}$= 14.65 reps, a progress of 6.78 reps.
- CV for Ti – 28.65% indicates a homogeneous group with a high data scatters and Tf – 18.75% - a relatively homogeneous group with moderate data scatter. As for individual values: all 17 subjects –showed progress with 3-10 reps.

At P3 the two study groups start with different mean values (Ti.G = 8.47 reps and Ti.B = 11.77 reps) with a difference of 3.3 reps in the favor of boys. At Tf the girls showed a 6.18 reps progress in comparison with Ti, and the boys a 5.77 reps progress.

- ***P4. Bending the torso forwards (Stand and reach test)***

The results obtained for the 13 boys included in the study group are presented in Figure 9:

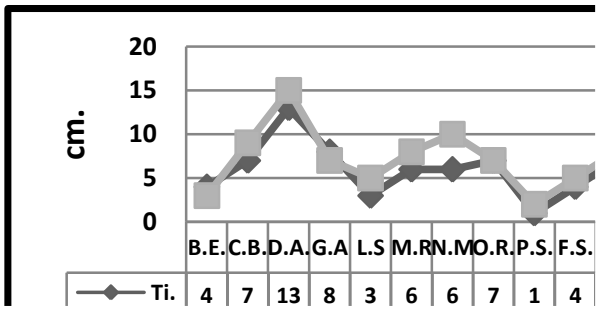

Figure 9. Individual value distribution for P4 – boys

- For Ti - $\bar{x}$ = 6.33 cm and for Tf - $\bar{x}$= 7 cm, a progress of 0.67 cm.
- CV for Ti (46.43%) indicates an inhomogeneous group with a very high data scatter and for Tf. (21.41%) indicates a moderate data scatter. As individual values: out of the 13 subjects – 12 showed progress, and one had 0 cm.

The results obtained for the 17 girls included in the study group are presented in Figure 10:

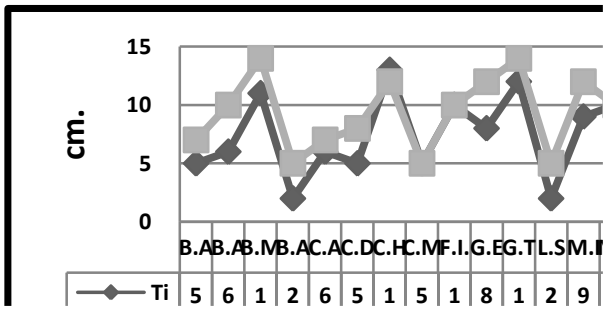

Figure 10. Individual value distribution for P4 – girls

- For Ti - $\bar{x}$ = 7 cm and for Tf - $\bar{x}$= 8.82 cm, a progress of 1.82 cm.
- CV for Ti – 47.65% indicates an inhomogeneous group with a high data scatters and Tf – 35.67% - an inhomogeneous group with high data scatter. As for individual values: out of the 17

subjects – 14 showed progress with (1-5 cm), 2 (11.7%) came to a standstill, and 1 girl was set back.
At P4 – by analyzing the comparative results we determined an evident progress for the girls' group, with 1.82 cm in comparison to that of the boys' group of only 0.67 cm

- ***P5. – Standing long jump***

The results obtained for the 13 boys included in the study group are presented in Figure 11:

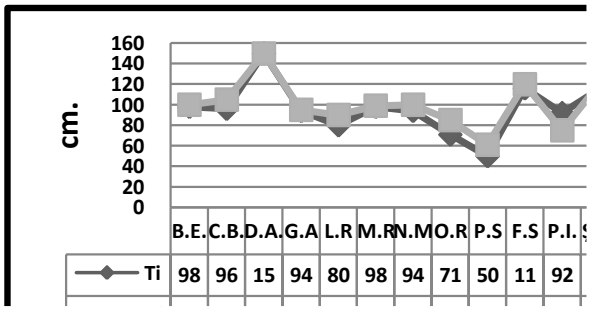

Figure 11. Individual value distribution for P5 – boys

- For Ti - $\bar{x}$ = 94.54 cm and for Tf - $\bar{x}$= 98.85 cm, a progress of 4.31 cm.
- CV for Ti (25.76%) indicates an inhomogeneous group with a high data scatter.
- and for Tf. (22.68%) indicates an inhomogeneous group with a moderate data scatter.

As individual values: out of the 13 subjects –12 showed progress (92.3%), and one was set back with 17 cm.
The results obtained for the 17 girls included in the study group are presented in Figure 12:

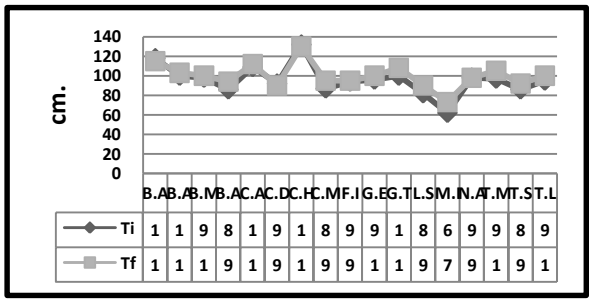

Figure 12. Individual value distribution for P5 – girls

- For Ti - $\bar{x}$ = 96 cm and for Tf - $\bar{x}$= 100 cm, a progress of 4 cm.
- CV for Ti – 15.72% indicates an homogeneous group with a moderate data scatters and Tf – 12.37% - a homogeneous group with low data scatter. As for individual values: out of the 17 subjects – 13 showed progress with (1-11 cm), 1 came to a standstill, and 3 girls were set back.

At P5 the progress of boys was higher (4.31cm) in comparison with that of girls (4 cm), although the medium values of girls at both Tf and Ti were higher (Ti G – 96 cm/ Ti B – 94.54 cm, Tf G – 100cm/ Tf B – 98.85 cm).

Conclusions

After applying the motricity tests proposed in our study, after the initial and final testing, we managed to see an enhancement of the indices for the tested skills, and through direct observation we determined that the children have a "self-overcoming" power of will. These aspects validate the hypothesis we proposed. The progress was materialized in: number of repetitions, centimeters, and number of points scored – they further strengthened our determination that balanced physical development exercises at this age (5-6) have a positive influence on the correct posture of children, that they make up the basis of general movement, and that they enhance the values of motricity indexes.
Analyzing the results from the 5 tests we came to the following conclusions:
At P1 – boys show a higher progress than girls B – 5.62 reps, G – 1.94 reps.
At P2 – the girls have a slight advantage with 1.70 reps in comparison to boys 1.30 reps.
At P3 – the girls overcame the boys with 6.18 reps compared to 5.77 reps.
At P4 – the girls have the lead with 1.87 cm in comparison to boys 0.67 cm.
At P5 – the boys have the lead with 4.31 cm in comparison to girls with 4 cm.

Recommendations

In order for physical exercises to have positive effects on a child's body they need to be selected and balanced depending on the particularities of age, gender, and level of proficiency.
We propose:

- Using these exercises as part of a complex that would comprise out of 4-6 exercises that are logically connected;
- These complexes can have an eurythmic aspect;

- The chosen exercises need to have a positive influence on posture and movement aesthetics;
- Physical development exercises can be used as refreshment programs, performed on a daily basis during mandatory activities or at home, creating the premises for a healthy life-style;
- Increasing the number of psycho-motor activities and, if possible, their application by professionals specialized in this fields;
- Equipping the kindergartens with adequate spaces and with the materials needed for these activities.

From the five tests, three (P2, P3, P4) belong to the girls and two (P1 and P5) belong to the boys.

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