

ASSESSMENT OF THE POSTURE WITH THE STUDENTS OF THE FIRST GRADE OF PRIMARY SCHOOL

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<https://doi.org/10.17060/ijodaep.2017.n1.v3.1015>

Fecha de Recepción: 3 Febrero 2017
Fecha de Admisión: 1 Abril 2017

ABSTRACT

During childhood, respectively in adolescence, the human physiological changes due to growth and development of physical and mental functions. There are many factors that affect the growth and development of the individual, and which are reflected in its physical structure.

The aim of this study was to determine whether muscular imbalance were observed in the group of pupils in the first grade of elementary school. As methodology, we chose to examine shortened and weakened muscles by Janda. Survey sample consisted of students of the first grade at two elementary schools in Ruzomberok. The survey was conducted in the years 2015 - 2016, with the consent of parents, children and school head teachers. Students were divided into 4 groups, and we evaluated the incidence of faulty posture in pupils of first, second, third and fourth grade.

Key words: primary school students, back pain, back exercises, posture

INTRODUCTION

The most appropriate way to “fight” against the formation of bad posture and its complications is preventive - educational process. In our study we did a guide to school age – elementary school, when the foundations posture still shape, the muscles are elastic and formable, children love movement, which is a good for the formation of correct posture and proper exercise habits and healthy life a style yet to acquire.

As a precautionary - the educational activities of the project team staff composed of a doctor neurosurgeon, an orthopedic surgeon, a physiotherapist, a nurse and teaching staff have developed an assembly healthy exercise for children in elementary schools. Reports are prepared in accordance

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ce with the State educational program ISCED 0, valid in the Slovak Republic, further to the specific competencies of children, development of which direction, and the strategies of educational - educational activities such as word instruction, an illustration, instructions by touch, principles of succession and adequacy, praise, encouragement, warning (Rusnak et al., 2014). Strategy upbringing - educational activities are combined with the principles of medical practice, such as: accuracy and precision of exercises targeting exercises for a particular muscle, maintaining physiological postural before and during exercise, slow implementation of exercises - no swing movements accompanied by breathing and relaxation (Rusnak et al. , 2014). In accordance with the State Curriculum 0 the exercises start from lower positions – sitting, lying on the stomach, lying on the back to vertical position – standing. All sets are preceded by a dynamic warm-up supporting the development of gross motor skills. Anatomical peculiarities in preschool children cause some limitations in the sets: positions are not kept for a long time, no unilateral load, no fast backward head tilting, no hanging or front support, no uncompensated backward bending in loins and lumbar spine (K ístek, Dvo áková, 2012). The quality of delivery of health exercises we compositions recorded on DVD, which serves as an aid in teaching staff working with children in nurseries. The DVD is part of the methodological guide that thoroughly describes each exercise, mistakes which should be avoided during exercise, motivation, repetition of individual exercises. For educators, we implemented specialized training courses, which inform them how to diagnose children with bad posture as a health exercise in nurseries and implemented if serious deformities of the spine to proceed.

AIMS

The main objective of the study was to determine whether compiled by healthy exercise for children in the first grade of elementary schools can affect posture. Within partial objectives we have followed through and exercise can affect the position of the spine the second sub-objective, we monitored the position of the head and the third sub-objective position of the shoulders.

OBJECTIVES

The research sample consisted of students of the first grade of elementary school (grades 1-4) in Ruzomberok, Slovakia. The sample consisted of 62 boys and 58 girls. A pilot study was conducted in the period December 2015 to December 2016. In the beginning and in the end of pilot study the children were examined by aspection and the results were then compared. The results comparison are indicated in the table. For the processing of the results were used MS Excel.

METHODOLOGY

Body posture is the characteristic way one s body segments are positioned in space whether being static or while moving. Several authors (Kolá a kol, 2009, Blahušová, 2002, Sochová, 2002) define the ideal body posture as follows:

- the chin at right angle to the neck, the connecting line between the external auditory meatus and the eyes is horizontal and the vertex pulled up, the head in alignment with the body axis,
- shoulders pulled back and down, shoulder blades are symmetrical and drawn to the ribcage, upper limbs loosely on the sides of the trunk,
- the stomach tucked in,
- the spine with no scoliotic curvature in frontal line and with continuous curves in sagittal line,
- the pelvis symmetrical in frontal line, in sagittal line so called inclinacio pelvis or pelvic inclination or neutral pelvic position,
- the legs position loosely one next to another, with the parallel feet.

This is called a proper body posture or ideal, physiological posture. Any deviation from proper

body posture is called incorrect posture which is defined by forward head posture connected with a slight recline, hyperkyphosis, protruding shoulder blades, weakened upper back muscles and shortened breasts muscles, accentuated lordosis, weakened abdominal muscles, shortened knee joints flexors, weakened gluteal muscles, mainly m. gluteus maximus (Hromádková, 2009). If we did not pay attention to issues and symptoms of incorrect posture, they would lead to serious back deformities, intervertebral discs damage, faster degenerative backbone changes and vertebrogene pain that become a serious issue of each patient.

RESULTS

The first one is the backbone aspexy examination. We followed the backbone curvature on sagittal plane in 120 pupils in elementary school. The initial examination confirmed a pathological backbone curvature in 45 boys (72,58%) and physiological curvature in 17 boys (27,42%). The final examination showed improvement in the axial body in 21 boys, with 38 boys out of 62 with physiological sagittal plane backbone curvature (61,29%) and 24 boys (38,71%) with the wrong backbone curvature. Total improvement in group of boys were 33,87% (Table 1)

Table 1:
Backbone curvature - boys

| Back view | Backbone | | | | | | | |
|------------------------------|-------------|------|--------|--------|---------|--------|------------|-----------|
| | Boys (n=62) | | | | | | | |
| | ↑ C | ↑ TH | ↑ L | flat C | flat Th | flat L | physiolog. | patholog. |
| Initial (n) | 2 | 4 | 39 | 0 | 0 | 0 | 17 | 45 |
| Initial percentage (%) | 3,23 | 6,45 | 62,90 | 0,0 | 0,0 | 0,0 | 27,42 | 72,58 |
| Final (n) | 2 | 4 | 18 | 0 | 0 | 0 | 38 | 24 |
| Final percentage (%) | 3,23 | 6,45 | 29,03 | 0,0 | 0,0 | 0,0 | 61,29 | 38,71 |
| Difference in percentage (%) | 0,0 | 0,0 | -46,15 | 0,0 | 0,0 | 0,0 | 33,87 | -33,87 |

In the group of 58 girls, the initial examination confirmed a pathological backbone curvature in 32 girls (55,17%) and physiological curvature in 26 girls (44,83%). The final examination showed improvement in the axial body in 13 girls, with 39 girls out of 58 with physiological sagittal plane backbone curvature (67,24%) and 19 girls (32,76%) with the wrong backbone curvature. Total improvement in group of girls were 22,41% (Table 2)

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*Table 2:
Backbone curvature - girls*

| Back view | Backbone | | | | | | | |
|------------------------------|--------------|-------|-------|--------|---------|--------|------------|-----------|
| | Girls (n=58) | | | | | | | |
| | ↑ C | ↑ TH | ↑ L | flat C | flat Th | flat L | physiolog. | patholog. |
| Initial (n) | 4 | 7 | 21 | 0 | 0 | 0 | 26 | 32 |
| Initial percentage (%) | 6,90 | 12,07 | 36,21 | 0.0 | 0.0 | 0.0 | 44,83 | 55,17 |
| Final (n) | 4 | 7 | 8 | 0 | 0 | 0 | 39 | 19 |
| Final percentage (%) | 6,90 | 12,07 | 13,79 | 0.0 | 0.0 | 0.0 | 67,24 | 32,76 |
| Difference in percentage (%) | 0.0 | 0.0 | -10.7 | 0.0 | 0.0 | 0.0 | 22,41 | -22,41 |

Another parameter was the head posture from the side view and its forwarded position, when the chin and the neck are not at right angle and such position is known as pathological.

Such forwarded position was found in 9 boys (14,52%), the head position was physiological in 53 children (85,48%). No other head deformities were detected. The final examination showed 8,06% improvement as the forwarded head posture was corrected in 5 boys (Table 3).

*Table 3:
Head position - boys*

| Side view | Head | |
|------------------------------|---------------|-----------|
| | Boys (n=62) | |
| | physiological | forwarded |
| Initial (n) | 53 | 9 |
| Initial percentage (%) | 85,48 | 14,52 |
| Final (n) | 58 | 4 |
| Final percentage (n) | 93,55 | 6,45 |
| Difference in percentage (%) | 8,06 | -8,06 |

In the among group of girls the same parameter - the head posture from the side view and its forwarded position, when the chin and the neck are not at right angle and such position is known as pathological. Such forwarded position was found in 19 girls (32,76%), the head position was physiological in 39 girls (85,48%). No other head deformities were detected. The final examination showed 20,69% improvement as the forwarded head posture was corrected in 12 girls (Table 4).

Table 4:
Head position - girls

| | Girls (n=58) | |
|------------------------------|---------------|-----------|
| | physiological | forwarded |
| Initial (n) | 39 | 19 |
| Initial percentage (%) | 67,24 | 32,76 |
| Final (n) | 51 | 7 |
| Final percentage (n) | 87,93 | 12,07 |
| Difference in percentage (%) | 20,69 | -20,69 |

Last two parameters evaluated by aspey were antversion and protruding shoulder blades (scapula alata). The initial examination showed antversion in 38 boys (61,29%) ahile physiological position was found in 24 boys (38,71%). The final examination showed discreet improvement, only 9,68 % (Table 5).

Table 5:
Shoulders position - boys

| Back view | Shoulders Boys (n = 62) | |
|------------------------------|----------------------------|------------|
| | physiological | antversion |
| Initial (n) | 24 | 38 |
| Initial percentage (%) | 38,71 | 61,29 |
| Final (n) | 30 | 32 |
| Final percentage (%) | 48,39 | 51,61 |
| Difference in percentage (%) | 9,68 | -9,68 |

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Last two parameters in group of 58 girls evaluated by aspexy were antversion and protruding shoulder blades (scapula alatea). The initial examination showed antversion in 18 girls (31,03%) ahile physiological position was found in 40 girls (68,97%). The final examination did not show any improvement (Table 6).

*Table 6:
Shoulders position - girls*

| Back view | Shoulders Girls (n = 58) | |
|------------------------------|-----------------------------|------------|
| | physiological | antversion |
| Initial (n) | 40 | 18 |
| Initial percentage (%) | 68,97 | 31,03 |
| Final (n) | 40 | 18 |
| Final percentage (%) | 68,97 | 31,03 |
| Difference in percentage (%) | 0.0 | 0.0 |

Bilateral protrusion of the shoulder blades was detected in 25 boys, a protruding left shoulder blade in 6 boys, a protruding right shoulder in 7 boys, which means that pathological shoulder blades position was detected in 38 children (61,29%) Proper shoulder position was detected in 24 boys (38,71%). The final examination showed improvement of bilateral protrusion of shoulder blades in 4 boys (6,45%), a protruding right shoulder blade in 2 boys (3,23%) and a protruding left shoulder blade in 3 boys (4,84%) (Table 7).

*Table 7:
Shoulder blades position - boys*

| Back view | Shoulder blades Boys (n = 62) | | | | |
|------------------------------|----------------------------------|-----------------|------------------|-----------------|----------------|
| | symetrical | Protruding both | Protruding right | Protruding left | Non symetrical |
| Initial (n) | 24 | 25 | 7 | 6 | 38 |
| Initial percentage (%) | 38,71 | 40,32 | 11,29 | 9,68 | 61,29 |
| Final (n) | 33 | 21 | 5 | 3 | 29 |
| Final percentage (%) | 53,23 | 40,32 | 8,06 | 4,84 | 46,77 |
| Difference in percentage (%) | 14,52 | -6,45 | -3,23 | -4,84 | -14,52 |

Proper shoulder position was detected in 50 girls (38,71%). In group of 58 girls bilateral protrusion of the shoulder blades was detected in 6 girls, a protruding right shoulder in 2 girls, which means that pathological shoulder blades position was detected in 8 girls (13,79%). The final examination showed improvement of bilateral protrusion of shoulder blades in 2 girls (3,45%), a protruding left shoulder blade in 1 child (1,72%) (Table 8).

Table 8:
Shoulder blades position - girls

| Back view | Shoulder blades | | | | |
|------------------------|-----------------|-----------------|------------------|-----------------|-----------------|
| | Girls (n = 58) | | | | |
| | symmetrical | Protruding both | Protruding right | Protruding left | Non symmetrical |
| Initial (n) | 50 | 6 | 0 | 2 | 8 |
| Initial percentage (%) | 86,21 | 10,34 | 0,0 | 3,45 | 13,79 |
| Final (n) | 53 | 4 | 0 | 1 | 5 |
| Final percentage (%) | 91,38 | 6,90 | 0,0 | 1,72 | 8,62 |

DISKUSION

Incorrect posture constitutes a serious problem present time. Monitoring the current situation, we confirm this fact. We in Ruzomberok in the pilot study examined 120 children and at each we found errors in posture, whether position of at the head, blades, arms or curvature of the spine.

As the to us a pilot study confirmed the seriousness of the situation in the posture in such a young age, we decided to apply the health exercises for children first grade of primary school.

Despite a smaller survey sample, we recorded positive results of medical exercises for posture in children in the first grade of primary school. The most significant improvement in posture, we observed the curvature of the spine in the sagittal plane. Curvature of the spine improved by 33.87% boys and 22.41% girls. On the contrary, the most important problem that we have seen in assessing posture in children was holding a gapping shoulder blades. Anteversion arms was recorded in 64.3% of children at baseline and at the outlet to prevent editing. Anteversion shoulders occurs as a consequence of shortening the pectoral muscle (Kolar et al., 2009) and the muscles at least managed to control by exercise. Improvement was recorded in only 6 boys, among girls have not seen improvement. We believe that the persistence of anteversion prominence arms and blades may be related to lack of exercise children, which is being replaced in modern times by sitting at the computer or watching TV, the shortening of pectoral muscles, shoulders and anteversion gapping blade support. This presumption will be followed in implementing the next phase of the project.

Of course it is clear that the quality of postural functions can not be established only on quantified curvature of the spine. For "normal form" of the spine in the sagittal plane in the vertical it is not uniform definition. Lewit (2003) describes the "individual norm" for the lateral projection of the spine.

In a study conducted in the Czech Republic, Langmajerová, J. et al. (2012) reported that senti-nel holding the head and cervical spine with intrarotáciou shoulders are most often identified deviations (more than 76% of children at the exit examination). They also state that the most common type of posture during the examination was kyfolordotické to hyperkyfolordotické posture, occurring

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in 49% of children. In the final assessment that more than 38% of children diagnosed with the incorrect posture.

CONCLUSION

In children during school age they tend to postural disorders diagnosed as faulty posture. Incorrect posture is indeed assessed in the diagnosis as "soft sign", but is also recognized as a risk for the future development of pathological functional and morphological vertebroviscerálnych painful conditions of the spine and associated anatomical structures. The resulting vertebrogenic alic syndrome is then in adulthood leading cause of long-term sick not only in the Slovak Republic.

In expert circles there is a general understanding of the need for physical activity during physical development of children and youth in order to ensure optimal physical and mental development. The current trend, however, is indicative of an increasing percentage of children avoided to physical activity in favor of passive recreation.

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