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THE CORRECTION OF THE SPINAL COLUMN DEVIATIONS FOR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS FROM SECONDARY SCHOOL

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ABSTRACT. *Introduction:* The correction of the spinal column deviations for children with special educational needs is an important aspect, especially in the context of the current tendency of social inclusion for this category of people. A correct posture represents the "cornerstone" for a healthy lifestyle, and this implies paying more attention to physical exercises, alimentation and the balance between work and rest. *Material and methods:* The research had been done on a group of six students with special educational needs from "Special number 2 secondary school" from Baia Mare and it was held between 15.11.2013 and 30.04.2014. The recovery programs include both simple and complex exercises, with a higher level of difficulty. Having in mind the special features of the subjects, the recovery period was parted in three stages. *Results:* The improvement of the rig cage mobility in the final evaluation was visible for every participant. Regarding the abdominal perimeter when it comes to inhaling and exhaling, the improvements had been up to 1cm in the final evaluation for most cases. After testing the mobility by measuring the distance between the fingers and the ground in the final evaluation, the results had improved significantly for most subjects. *Conclusion:* The improvement of the respiratory capacity is demonstrated through the progress regarding the rib cage mobility, the abdominal perimeter and the torso for all the participants from the recovery program. The amelioration of articular mobility is also confirmed by the results obtained after having applied the specific tests.

Key words: *educational needs, correction, mobility.*

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REZUMAT. ***Corectarea deviaţiilor coloanei vertebrale la elevii cu cerinţe educative speciale din ciclul gimnazial.*** *Introducere:* Corectarea deviaţiilor coloanei vertebrale la elevii cu cerinţe educative speciale reprezintă un aspect important, mai ales în contextul tendinţei actuale de incluziune socială al acestei categorii de persoane. O postură corectă reprezintă „piatra de temelie" pentru un stil de viaţă sănătos, iar acest lucru implică acordarea unei atenţii deosebite exerciţiilor fizice, alimentaţiei şi echilibrului dintre muncă şi repaus *Material şi metode:* Cercetarea a fost realizată pe un grup de 6 elevi cu cerinţe educative speciale de la "Şcoala gimnazială specială numărul 2" din Baia Mare şi s-a desfăşurat în perioada 15.11.2013 - 30.04.2014. Programele de recuperare conţin atât exerciţii simple cât şi exerciţii complexe, cu un grad mai ridicat de dificultate. Având în vedere particularităţile subiecţilor, perioada de recuperare a fost împărţită în 3 etape. *Rezultate:* Îmbunătăţirea mobilităţii cutiei toracice în cadrul evaluării finale este evidentă la toţi participanţii. În ceea ce priveşte modificarea perimetrului abdominal în inspir şi expir maxim, se poate observa o îmbunătăţire cu 1cm în cadrul evaluărilor finale în majoritatea cazurilor. În urma aplicării testului de mobilitate reprezentat de distanţa degete-sol din etapa finală a cercetării, se pot observa cele mai semnificative îmbunătăţiri la majoritatea subiecţilor. *Concluzii:* Îmbunătăţirea capacităţii respiratorii este demonstrată prin progresele obţinute în ceea ce priveşte mobilitatea cutiei toracice, perimetrul abdominal şi bustul în rândul tuturor participanţilor la programul de recuperare desfăşurat. Ameliorarea mobilităţii articulare este confirmată de rezultatele obţinute în urma aplicării testelor specifice.

Cuvinte cheie: *cerinţe educative, corectare, mobilitate.*

Introduction

The motor development for children with mental deficiencies is directly proportional to the deficiency and the physical development level. The motor and psycho-motor organisational plans are different from the normal children and they are caused by:

- ✓ „the immaturity or the lesion of the morphofunctional structures responsible for the general and special motor activity;
- ✓ The subcortical lesions which do not allow an integrative synthesis coordination for the motor behaviour;
- ✓ The emphatic autonomy of the somatic structures in comparison to the psychological ones;
- ✓ The lack of a hierarchical ascending and descending organisation in the transmission and the procession of the information;
- ✓ The weak intellectual dominance" (Teodorescu, 2003, p. 148).

The main problems in means of motor abilities for the mentally deficient are:

- ✓ they execute with difficulty fundamental moves, having problems with oculomotor, auditive, verbal or physical coordination;
- ✓ the quality of the moves is lowered by the weak motor development;
- ✓ they have a low capacity of coordinating the motor activities guided only by verbal indications. They need to be accompanied by demonstrations;
- ✓ turning from one movement to a new one is more difficult if it includes using equipment or other objects;
- ✓ usually they cannot find a suitable way of expressing their thoughts, ideas or feelings through adequate gestures;
- ✓ being overweight in some cases can affect the biomechanics and the stability;
- ✓ the arrhythmic respiration and its lack of control;
- ✓ the low muscle tone can negatively influence the movements of the mentally deficient (Bălteanu, 2005; Gherguţ, 2007, Bujdosó, 2010).

Giving equal chances in teaching children with special education needs, regardless of the physical, intellectual, linguistic or any other kind of ability the children posses, is a basic condition when it comes to their mental and social development.

To reach certain performances with these students thorough preparations, tact, pedagogical mastery and the continuous training of the teacher are needed for acquiring some skills and motor habits among students. Any kind of activity must be initiated and conducted in a language accessible to the age and the particularities of the participants; this will favourably contribute to boosting their personalities.

Materials and methods

The research has been done on a group of 6 students with special education needs from the ”Special Secondary School number 2” from Baia Mare and it was held during the following period of time: 15.11.2013- 30.04.2014. The group consisted of three boys and three girls, with ages between 13 and 14 years.

For holding the recovery program we had a kinetotherapy room available which offered all the conditions needed for the study, evaluation and recovery through medical gymnastics. The analysis passed off in collaboration with the physiotherapists from the school.

Table 1. The presentation of the studied group

Nr. Crt.	Name and Surname	Sex	Age	Diagnostic
1.	S.A.	F	13	Kyphotic attitude; slightly mentally retarded
2.	S.A.	F	13	Kyphosis; slightly mentally retarded
3.	T.T.	F	13	Kyphotic attitude; slightly mentally retarded
4.	C.D.	M	13	Kypho-lordosis associated with lumbar scoliosis; slightly mentally retarded
5.	C.E.	M	14	Kyphosis associated with thoracic scoliosis; severe mental retardation
6.	V.V.	M	13	Kyphotic attitude; autism

The research took into consideration the following aspects: the place, the materials and the working conditions, the schedule of the subjects, their level of motor and psychological development and the period of time spent for the recuperation.

The research methods were: bibliographic documentation, observation and the interview. These methods allowed us to obtain general and more specific information regarding the subjects which facilitated the organisation of the activities.

The recovery programs contain both simple and complex exercises, with a higher difficulty level. Having in mind the particularities of the subjects, the recuperation period was parted in three stages (Gallahue, 1993; Sbenghe, 1999; Teodorescu, 2003; Marcu, 2007; Vekerdy, 2010; Marolicaru, 2011).

Because 4 out of 6 subjects weren't attending physical education classes, the first step was to teach the children basic exercises for the locomotor apparatus (Chelemen, 2006).

The second and the longest lasting stage consisted of many recovery exercises which were executed in the order of their difficulty and complexity. The children's will to learn the exercises faster was also determined by the alternation between the types of exercises, in this way maintaining their interest and involvement.

Because the subjects were 13 and 14 years old, at the end of every session we played a game which involved movement. Along with the exercises done in pairs, the games turned out to be an essential part in the socialization and relaxation process of the subjects, next to the therapeutic one.

At the end of the recovery program we applied the exercises done during the research period in the form of a circuit. This meant that each subject had to execute as many correct repetitions of an exercise as he could in two minutes, and after a one minute break he had to exchange seats with one of his colleagues so he could turn to another type of exercise. Before starting the exercises, they were explained and demonstrated if necessary so that every student knew what he was supposed to do. During this program the subjects were monitored, corrected and encouraged not to stop until they heard the signal that the exercise was over. Thus, at the end of the circuit, every subject had executed 6 exercises, each of them lasting for two minutes.

Results

a) Results obtained at the end of the evaluations

The mobility of the chest is a useful method to measure the respiratory capacity The results obtained at the end of the first measurements indicate values between 1cm and 9cm. According to the values presented in the second table, subject C.D. (boy) has the lowest level of chest elasticity and subject T.T. (girl) as the best value for this parameter.

Alongside the chest mobility, measuring the abdominal perimeter while inhaling and exhaling is also a useful method of evaluation for determining the respiratory capacity(Kovács, 2010, Fazekas, 2010). The results obtained after the initial measurements indicate values between 0cm and 5cm.

The values obtained at the test that measures the distance between the fingers and the ground exceed 0cm, which is the normal value for this test.

The Ott test indicates values of distance between 0cm and 3cm, as against to 8cm which would be the normal value in case of the absence of a pathological state of the spinal cord.

After taking the test which measures the distance when separating the fingers, the values were between 0,4cm and 1cm, opposed to the normal value, which is between 3cm and 4cm.

For the last test, the distance between the ear lobe and the acromion was between 9cm and 15cm when turning the head to the right and 8cm and 11cm when turning the head to the left. For this test, subjects C.D. and C.E. (boys) present different mobility values when turning their head to the right and left. The reason for these values are the deviations of the spinal cord in the frontal and sagittal plane: the kypho-lordosis associated with lumbar scoliosis and the kyphosis associated with thoracic scoliosis.

b) The comparative interpretation of the test results

In the following paragraphs we will present two comparative tables with the results obtained in the two key-stages of the research (initial and final). Before starting the interpretation, we would like to mention that the male subjects have more serious backbone deviation problems than the female ones and this reflects in their evolution during the recuperation program. Also, the different levels of mental retardation was an important factor in the progress of every subject.

The results of the first three tests offer substantial information regarding the respiratory capacity of the subjects. For a more coherent explanation about the subjects' improvement, we will use a graphic representation.

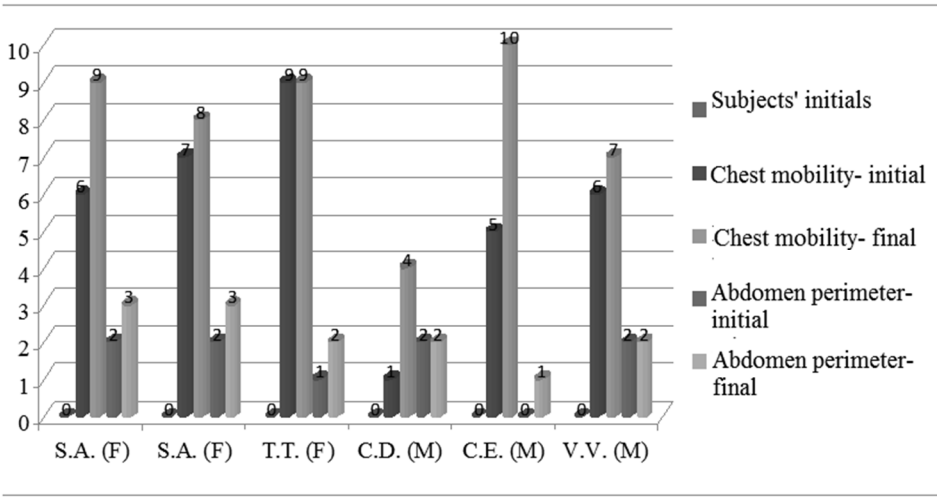

Fig. 1. The representation of the initial and final results of the chest mobility and abdominal perimeter

The chest mobility improvement is obvious for all the participants from the final evaluation. Male subject C.E. has the best improvement for this parameter which states his thoracic respiration amelioration.

As far as the modification of the abdominal perimeter while inhaling and exhaling are concerned, an improvement of 1cm can be observed from the final examination in most cases, with the exception of male subjects C.D. and V.V. who had no changes for this parameter.

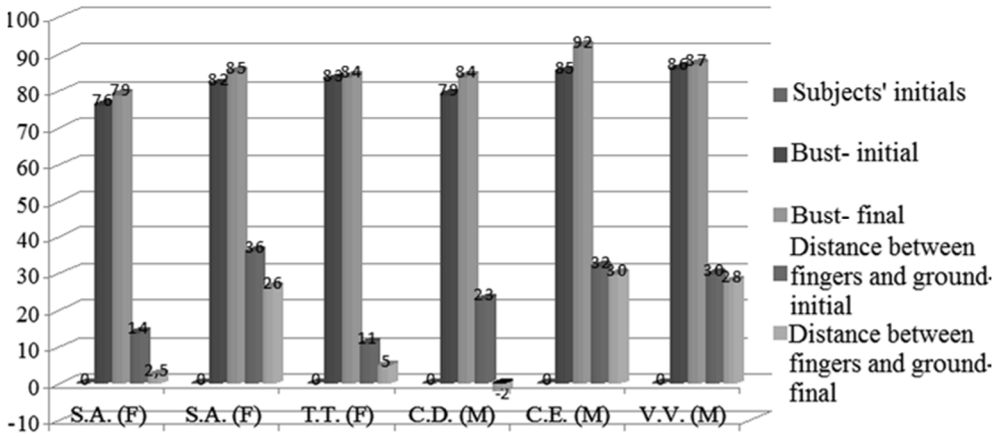

Fig. 2. The representation of the initial and final results of the bust and the distance between the fingers and the ground

The height of the body when sitting down (the bust) also presents improvements after the final measurements, which leads to differences between 1cm and 7cm from the initial evaluations. The best evolution can be seen at male subject C.E., who was diagnosed with kyphosis associated with thoracic scoliosis. This change indicates a significant amelioration of the subject's sitting posture and also the improvement of the muscle tone responsible for maintaining a correct posture.

After the mobility test for the distance between the fingers and the ground from the final stage of the research, most subjects present great improvements, especially male subject C.D. with a 21cm difference from the initial evaluation and female subject S.A. with a 11,5cm difference.

When it comes to the initial and final results after the Ott test, we can observe the evolution of 3 subjects out of 6: female subjects S.A. and S.A. with an improvement of 3cm and 0,5cm and male subject C.E. with an improvement of 1cm.

The distance between the two marks (spinal aphopysis C7 and T1) did not have significant changes after the final evaluations, although there was an improvement for the female subjects S.A. and S.A. of 0,2cm and 0,1cm.

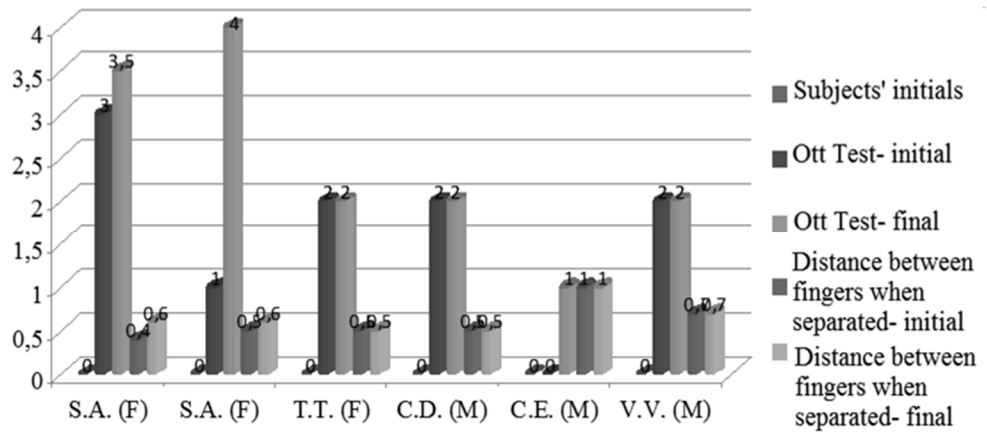

Fig. 3. The representation of the initial and final results for the Ott test and the distance between the fingers when they are separated

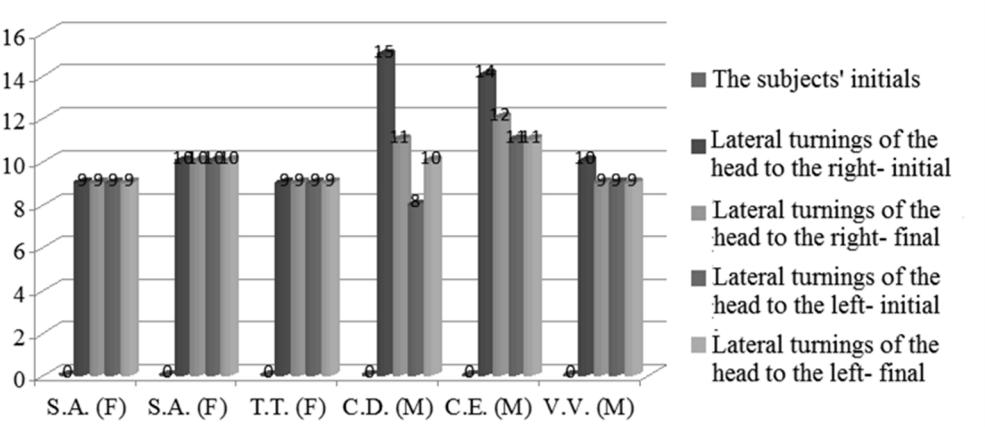

Fig. 4. The representation of the initial and final results for the lateral head turning

From the last test we can see a balance of the values obtained from the lateral turnings of the head to the right and to the left, especially for male subject C.D. Initially the subject had a 7cm difference between the two values, but after the final measurements the difference decreased to 1cm. Also, an evolution can be observed at male subject C.E. who initially had a 3cm difference that decreased to 1cm at the final evaluation.

Conclusions

The children's will to involve themselves in the activities was directly proportional with the level of the anxieties, which is why there were individual differences that reflected on the evolution of the subjects during the recovery program.

According to the results obtained after the final evaluations we can conclude the following aspects from the subjects' improvements point of view:

The respiratory capacity is obvious after seeing chest mobility progress, abdominal perimeter and bust among all the participants of the program. After the final evaluation, male subject C.E. diagnosed with kyphosis associated with thoracic scoliosis and severe mental retardation, has the best improvements of chest mobility and body height while sitting down. This accentuates the improvement of posture and muscle tone, which was one of the objectives of the research. In comparison with the test of body height while sitting down where all the subjects had progressed according to the final examination, the abdominal perimeter test did not have notable progress for male subjects C.D. and V.V..

The articular mobility amelioration is confirmed by the progress achieved after having the following tests: the distance between fingers and the ground, the distance between fingers when separated, the Ott test and the lateral turnings of the head. For the distance between fingers and the ground test, male subject C.D. and female subject S.A. have the most significant progress with a 21cm difference and a 11,5cm difference in the final evaluation.

The correction of the spinal cord deviations for students with special education needs is an important aspect, especially when it comes to the actual social inclusion of this category of people. A correct posture is the „cornerstone" for a healthy lifestyle, and this implies paying more attention to physical exercises, nutrition and work and rest balance.

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