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Original article

THE INFLUENCE OF PHYSICAL EXERCISE ON THE CORRECTION OF DEFICIENT ATTITUDES – A CASE STUDY

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Abstract*

Aim. The aim of the research was to identify and validate a personalized recovery program to improve the deficient attitude (kyphosis).

Methods. The research was conducted over five weeks and involved the application of some recovery programs, 3 times a week, the means used, combining physical therapy exercises with the global postural re-education. The subject of research (male, age 15) was tested before and after implementing the work programs through the Global Posture System. The subject was photographed from the front, rear and profile, the analysis being carried out according to the markings made on different anatomical points. It reviewed the lateral translation and angulations side for head, shoulder, hip and knee, aiming at employing changes in the working programme hours, following the application.

Results. After the final testing an improvement in the deficient attitude (kyphosis) was highlighted, the work program having a positive influence on the attitude of the subject, with a positive effect on his body mass.

Conclusions. The differences between the initial and final testing regarding the examined subject's posture, confirmed the efficiency of the work program. This study emphasizes the importance of investigating posture especially among teens, when there are bursts of growth. This research intends to fire a warning regarding the sedentary adolescents and the effects this may have on body posture and thus on the entire body.

Keywords: posture, screening, physical exercise, kyphosis, global postural re-education.

Introduction

Posture attitudes are increasingly present in the lives of young people and children, their appearance is one of the reasons that lack of exercise is often replaced with games on a tablet or phone.

Unfortunately, exaggerated use of modern technologies is present in the lives of young people during childhood and adolescence. Body growth and development during this period are marked by the elaboration of body balance and of the ability to guide the segment movements in space.

Rapid changes of the environment, sedentary life, less physical activity, and inadequate nutrition are inseparably associated with the progress of civilization (Seefeldt et al., 2002). Posture refers to the alignment and keeping the body parts in positions such as the orthostatic, the lying or sitting positions and is an important indicator of the musculoskeletal system functionality.

Posture must match a certain position of the body in space that minimizes the anti-gravitational stress on body tissues (Grimmer et al., 2002).

The most favorable period for the development and fixing of the faulty positions is the period of

growth and development of the body, though, also in adults, poor positions may occur due to misalignment and especially professional activities generating poor posture.

One poor postural attitudes that can be seen in adolescence is kyphosis. Postural kyphosis, the rounding of the back in the sagittal plane, is a flexible deformity that develops due to poor posture (Lovvel et al., 2006). Idiopathic juvenile kyphosis occurs in 0.4-8% of the general population. That represents the most common cause of kyphosis and the second prominent cause of back pain among children and adolescents (Lowe, 1999).

The causes contributing to correct postural changes may be multiple. Among them it must be mentioned in the first place, the child position in the bank at school or at the work table at home, where he spends a good part of the day, just during development and which influences the spine position during IT means and others operations.

The purpose of the study was to identify the role of exercise, especially global postural re-education techniques on postural deficiency correction for a

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patient diagnosed with idiopathic kyphosis.

Methods

The research was conducted over a period of 3 months, during which the subject of research (V.N., male, 15 years) participated 3 times a week in a rehabilitation program, the techniques used are mostly from Global Postural Re-education.

Subject V.N. was diagnosed with kyphosis and the main objective was to improve muscle strength, mobility and stability of the trunk and lower limbs. The global postural re-education lesson was individual because of the uniqueness of the individual must always be respected and studied, to have a decisive effect on pathology.

The subject was tested before (T1) and after the working hours (T2) through the postural graph. The parental consent was obtained for him to participate in this research after the dissemination of the investigational protocol.

The postural graph or the Global Postural System (GPS) is a postural analysis system that uses

advanced techniques and non-invasive methods of diagnosis and evaluation in medical recovery.

The postural analysis unit is used to determine deficiencies in the spine by means of a video camera that allows the acquisition of images of high resolution images are then processed by software. The global postural analysis system is meant to measure various body parts and frame the individual in a postural family.

The measurement was performed by photographing the patient from the front left and right and back. All these data help to identify the causes that give a wrong posture and possible malfunctions. The software allowed recording of personal data and comparison tests after a period of time to track the results achieved.

Results

After 36 sessions of Global Postural Re-Education, subject V.N. achieved an improvement by playing postural graph parameters, as shown in Image 1 and Image 2.

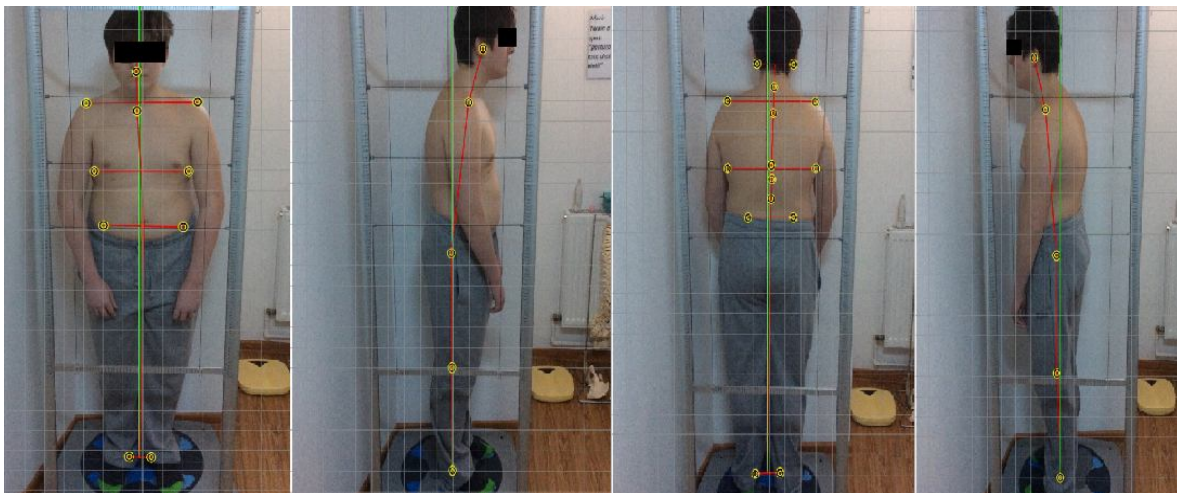
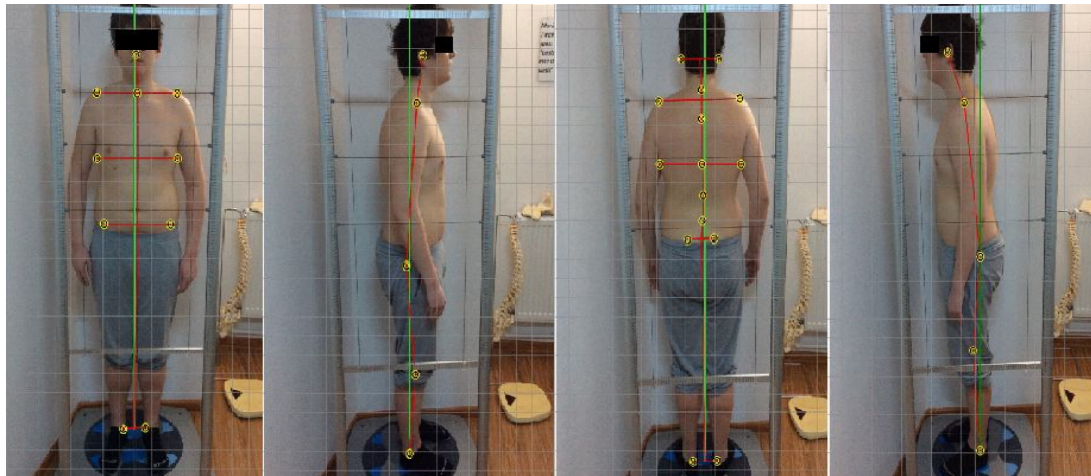


Image 1 First Test Previously, Lateral Right, Left Rear and Side View



Imagine 2 Final Test Anterior, Lateral Right, Posterior and Lateral Left View

Table 1 Postural Displacement Anterior and Lateral

	Anterior Translation	Anterior Angulation	Lateral Translation	Lateral Angulation
T1	1.60"	4.2°	6.85"	26.7°
T2	0.99"	2.9°	6.80"	24.2°
Difference	0.61"	1.3°	0.05"	2.5°
Progress	38%	31%	1%	9.36%

Regarding the anterior translation (Table 1), a breakthrough was achieved by 38%, the difference between the two tests is 0.61 ". A progress of 31 percent was recorded in the previous angulation, the

testing difference being 1.3 °. Also, in terms of lateral translation 1% progress was registered and lateral angulation had a breakthrough of 9.36%, with a difference of 2.5 °.

Table 2 Postural Displacement Posterior and Lateral

	Posterior Translation	Posterior Angulation	Lateral Translation	Lateral Angulation
T1	3.36"	12.00°	6.14"	25.7°
T2	2.57"	15.3°	10.98"	42.2°
Difference	0.79"	-3.3°	-4.84"	-16.5°

As expected, the changes in the anterior level have influenced the data to the posterior translation and angulation, their values rising.(Table 2)

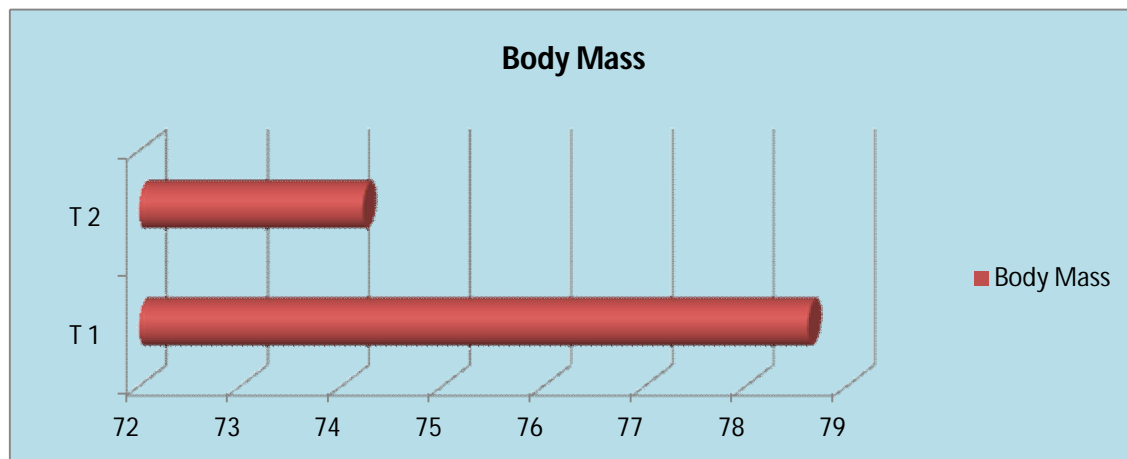
Table 3. Averaged Lateral Postural Displacement

	Head	Shoulder	Hip/Pelvis	Knee
Lateral Translation T1	2.85" anterior	3.08" anterior	0.14" posterior	0.42" posterior
Lateral Translation T2	2.59" anterior	2.98" anterior	1.85" posterior	1.48" anterior
Lateral Angulation T1	17.90° flexed	7.07° flexed	0	1.23 flexed
Lateral Angulation T2	16.06° flexed	6.05° flexed	5.83 "extended	5.26° flexed

In Table 3 the averaged postural lateral displacement in the head, shoulders, hips and knees is presented. Concerning the head, there is a noticeable improvement in terms of position and translation (9 percent) but also in angulation (10 percent). At the shoulder level there is a general improvement in shoulder anterior projection, the progress being 3.24% in lateral translation and 14.42 in terms of lateral angulation. Concerning the knee, in the first test there was observed a hyperextension, with

posteriorly positioning which may be due to an underdevelopment of the hamstrings muscles. This change from the second test, leading to a realignment of the exercises used in the knees.

The exercise used influenced the body mass, too, in the initial testing, the subject weighing 78.6 kg and 74.2 kg in final testing, 4.4 kg less compared to the moment of starting the research (graphic 1).



Graphic 1. Body mass initial and final evaluation

Discussion

The main type of activity for the pubertal period is the school training in terms of diversification of motivations, personality development, mobilizing skills and bio-motor full potential.

This stage is characterized by a pronounced pace of somatic development characterized by sexual dysmorphism characterized by imbalance between the different segments proportions and between the morphological spheres and the vegetative aspect met in our subject.

The right body attitude is the sign of balance, physically and mentally, resultant of normal harmonious development of the body. The correct body attitude thus depends on the health of the body and the nervous system.

There are studies that say that kyphosis can affect a person's life both mentally and physically (Saligheh et al., 2013 citing Babekir et al.,) and this may cause physical and emotional limitations (Saligheh et al., 2013 citing Leech et al. and Ryan, Fried).

There also appeared several devices of self-correcting kyphosis. Lou & all developed a smart garment system to reduce kyphosis that consists of a



harness and data- sensor loggers to be used during daily activities. (Lou et al., 2012).

However, these devices are uncomfortable and may limit the performance of certain movements. Physical exercise performed regularly and tailored to your individual needs can solve problems caused by poor postural attitudes. RPG physical therapy intervention method is capable of developing abdominal and back muscle strength, and also joint mobility. (Moreno et al., 2007).

Thus, our study certifies the positive role that physical activity has on kyphosis rehabilitation in children, the results recorded after applying the work program are clearly positive, especially on postural displacement from the anterior plan, relieving particularly the anteriorization of the head, the one leading to poor posture installation.

Conclusions

The differences between the initial and final testing regarding the examined subject's posture, confirmed the efficiency of the work program. This study emphasizes the importance of investigating posture especially among teens, when there are bursts of growth. This research intends to fire a warning regarding the sedentary adolescents and the effects this may have on body posture and thus on the entire body.

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References

- Grimmer K, Dansie B, Milanese S, Pirunsan U, Trott P, 2002, Adolescent standing postural response to backpack loads: a randomised controlled experimental study. *BMC Musculoskelet Disord.* 2002 Apr 17;3:10.
- Lovvel W, Winter R, Morrissy R, Weinstein S, 2006, Lovell and Winter's Pediatric orthopaedics, 6th edition, vol.2, Lippincott Williams&Wilkins, p.7998
- Lou E, Lam G, Hill D, Wong M, 2012, Development of a smart garment to reduce kyphosis during daily living, *Med Biol Eng Comput* 50:1147-1154
- Lowe TG, 1999, Scheurmann's disease. *Orthop Clin North Am*:30:475-485.
- Moreno M, Catai A, Teodori R, Borges B, Cesar M, Da Silva E, 2007, Efeito de um programa de alongamento muscular pelo metodo de Reeducao Postural Global sobre a forza muscular respiratoria e a mobilidade toracoabdominal de homens jovens sedentarios, *J. Bras. Pneumol.* Vol.33, no.6
- Saligheh M, Rahimi A, Sokhanguyi Y, 2013, To determine the correlation between postural deficiencies and severity depression in 15-18 years old kyphotic girls in high school of Iran, *Annals of Biological Research*, 4(10):71-74
- Seefeldt V, Malina RM, Clark MA, 2002, Factors affecting levels of physical activity in adults, *Sport Med*; 32(3):143-68