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THE OPTIMIZATION OF THE REHABILITATION TREATMENT BY
KINETOTHERAPY OF MECHANICAL CERVICALGIA ON
VIDEOTERMINAL USERS

ABSTRACT OF THE DOCTORAL THESIS

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The paper addresses a topical issue on the effects of using videoterminals (VDT) on the cervical spine and the way by which they can be influenced to achieve a better quality of life for those who maintain a professional monotonous extended position.

The research materialized by the development of the doctoral thesis was conducted for over 5 years of studies, from October 2011 to October 2016.

The thesis is divided into three parts:

Part I- Theoretical foundations on the recovery of the body posture changes induced by the mechanically triggered cervicalgia;

Part II - Preliminary research on the effects of the cervicalgia on the videoterminal users quality of life;

Part III - Contributions on the improvement of life quality by optimizing postural control in mechanically triggered cervicalgia.

Theoretical foundation involved studying various national and international bibliographic materials through which I wrote the scientific documentation on the topic addressed. Noting that specialized studies do not provide data on the subject proposed, I initiated the present study, following the steps imposed by developing a scientific doctoral thesis.

Preliminary research was ascertaining and was conducted during September 2013 - January 2014 based on two international validated questionnaires, *SF-36 Health Survey*, as amended on the recommendation of the main psychologist Nicula Marinela and *Neck Disability Index*. To the SF-36 Health Survey we have added two specific items that gave us information on the physical pain location and other conditions diagnosed by a doctor.

Useful information, like profession and number of hours on the use of VDT, was introduced within the overall data.

During September-November 2013 I applied questionnaires directly or sent by mail, on 400 people, but only 349 answered correctly and could be included in our research.

After processing the results we selected the first 10 videoterminals users surveyed which recorded the highest values of neck disability index score and who met the criteria for the inclusion in our study.

Criteria for inclusion in the study:

- Age 20-40 years;
- first painful episode;
- Without traumatic history;
- Profession involving computer work at least 4 hours;
- No neurologic problems.

During November - December 2013, the 10 subjects selected (8 women - 80% and 2 males-20%), followed the original rehabilitation program designed by us within 10 sessions at the kinetotherapy room of the Medical Diagnostic Center, Ambulatory Treatment and Preventive Medicine - Bucharest. However, each

patient was counseled regarding the need to follow the rules of the "school spine" postural hygiene and office ergonomics.

Kineto-therapy sessions, lasting 50 minutes, had a rate of 2-3 per week and were preceded by a relaxant massage and passive mobilizations of the cervical, upper chest and scapular-humeral regions.

Statistical processing of the obtained data through questionnaires **validated the two research hypotheses** of the preliminary investigation reporting that:

- Maintaining a monotonous positions for professional VDT users generates pain in the cervical spine and affects negatively the quality of life;
- Applying an original methodology on VDT users with vertebral static disorders increase the quality of life.

In this experiment I intended to appreciate, based on questionnaires, the changes on the quality of life and the neck discomfort in this small group of subjects, so that, in the third part of the thesis, to be able to create two groups, in which to evaluate the neck functionality.

The main research was held in the kineto-therapy room of the Medical Diagnostic Center, Ambulatory Treatment and Preventive Medicine - Bucharest and in a number of public institutions in Bucharest, on a sample of 40 subjects. Setting up the study groups was done progressively, from September 2012 to June 2015, as new detected cases agreed to participate in our study.

They had the same inclusion criteria like in the preliminary research, but for subjects in the experimental group 2 the agreement / possibility of carrying out the rehabilitation program in the office was added, in an one hour lunch break. For the first experimental group (EG1), consisting of 10 women and 10 men, I followed the methodology applied in the preliminary investigation, except that the number of sessions increased from 10 to 20.

The subjects of the second experimental group (EG2) also benefited by massage, exercise and Kinesio applications, with the same duration and frequency, the difference between groups consisting in the working conditions. Therapeutic intervention took place in the office, during an one hour break specified in the

work program, according to the internal rules of the employing company.

I made a complex evaluation form in which I entered general data (name, date of birth, sex, occupation, number of working hours at the computer) and parameters on which we intend to monitor in the research, respectively the cervical range of motion, the T7-acromion distance, the endurance of the cervical muscles, cervical pain intensity, neck disability index and the quality of life. The evaluation form has been filled for all 40 subjects (20 women - 50% and 20 men - 50%) before the first kinetotherapy session and the monitored parameters were reassessed at the end of treatment.

After conducting the research I have come to the following **conclusions**:

- The two experimental groups obtained in the statistical analysis of intra-group results significant changes in most monitored parameters .
- Intergroup statistical processing of the results revealed insignificant differences ($p>0.05$) on suboccipital mobility, lateral bending, resting position and anterior projection of the head and neck, T7-acromion distance measured during the rest.
- The intergroup difference between average values of flexion-extension and rotation cervical range of motion, the T7-acromion distance in the straightened position, endurance of cervical flexor muscle, pain intensity and neck discomfort is significantly greater benefit of the original kinetic strategy designed and implemented on experimental group 1.

Thus, **the hypothesis number one of the research**, multimodal therapeutic interventions may ameliorate the functional parameters altered by localized cervical pain **was confirmed**.

Both groups of subjects recorded improved quality of life, but no statistically significant differences between treatment strategies applied. Thus, **the 2nd hypothesis of the research**, that kinetic original program applied in the rehabilitation of cervicgia of mechanical origin can increase the life quality of the users of videoterminals, **was validated**.

Quality of life results do not negate the effectiveness of the original applied

methodology on GE1. This may be a viable alternative to conventional therapy.

Instead, the superior results of the somato-functional parameters modified by the neck pain entitle us to support the original methodology applied and to recommend its implementation in the practice of rehabilitation.

The original elements of this thesis can be summarized as follows:

- 1) Patients management, VDT users, of the first mechanical triggered cervical painful episode in acute stage; bibliography contains researches conducted on subjects in the chronic stage of cervicgia and the most frequent cause is traumatic. This has required a long-term collaboration with doctors from different specialties: family medicine, emergency medicine, orthopedics and rehabilitation, physical medicine and balneology.
- 2) Setting up a complex evaluation form, consisting of amplitude joint assessment, the T7-acromion distance, endurance of the cervical muscles, neck pain, neck discomfort and quality of life.
- 3) Using a special device for measuring the range of motion of the neck, including its projection in the sagittal plane; it is CROM3 that ensures data accuracy.
- 4) Combination of the kinetic program with Kinesio taping, a tandem applied in national premiere on the addressed pathology.
- 5) Using a new technique of PNF consisting of an isometric contraction of the agonist muscles with its slow stretching during relaxation, stretching performed by physiotherapist by passive mobilization of 5-10 degree amplitude. This may be included in relaxation techniques, resulting in an increased range of motion while relaxing contracted muscles.