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THE COMPLEXITY OF THE KINETIC PROGRAM APPLIED IN PAINFUL LUMBAR SYNDROME TO MIDDLE-AGED PERSONS

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Abstract. *The painful lumbar syndrome, as evidenced by the literature in practice and in researches, we have found that this disease can be called "the disease of the century" because every person presented during the lifetime a painful episode in the lumbar spine, that is why motivated my interest in this study.*

About 80% of adults suffer from back pain in the lumbar region. It is the most common cause of work-related disability. Men and women are equally affected by back pain, which can range in intensity from constant pain to a sharp sensation that makes movements impossible. Pain can start suddenly as a result of an accident or by lifting heavy objects or it may develop over time due to age-related changes of the spine. Recently, the problems of the middle-aged persons have been discussed under following aspects: preventive and therapeutic approach. Previous studies on the preventive aspect have been largely focused on the educational preparation for a successful approach regarding the people in this stage of life, heading towards the transition period for the next stage of life.

Keywords: *painful lumbar syndrome, pain, active kinetotherapy, mechanical elongation, lombosciatics, hernia.*

Actuality. Studies and researches until now have made it clear that the frequency of painful lumbar syndrome is very high. Some of the objective and most common causes that trigger and favor lumbar pain syndrome may be: external factors such as cold, weight gain, falls, accidents, incorrect posture or other associated diseases, and internal factors such as dehydration, osteoporosis, etc.

Psychomotricity is a decisive factor in the economy of movement and directly influences both postural function and locomotor activity [6].

Research hypothesis. It is assumed that by using kinetic methods and techniques and by combining them with other complementary methods, it can contribute to the kinetic recovery of painful lumbar syndrome in the middle-aged persons.

The aim of the research is to identify aspects of kinetic treatment applied in painful lumbar syndrome in the middle-aged persons, application of kinetic methods and techniques, analysis of existing kinetic programs and their efficacy in the kinetic treatment of painful lumbar syndrome.

The scientific novelty consists in the elaboration and implementation of a complex recovery program specific to physical therapy, with a role in maintaining the correct postural attitude by increasing the somatometric, functional and motor parameters, ensuring general and psychic relaxation, improvement of general movement capacity and social reintegration. The originality of the paper lies in the first use of this kinetic recovery methodology and its implementation in the kinetic recovery of PLS.

The theoretical importance consists in the scientific approach of the methodological concepts obtained by the results of the research, based on which a work program was

proposed to combat the deterioration of the state of health by inability to function, the installation of a vicious postural attitude by developing the psychomotor skills with the help of elaborated methods and technology.

Painful lumbar syndrome can be caused by trauma, generally minor and repeated trauma. Pathogenically there are three types of triggering factors: predisposing, favored and determinant [4, 15]. The physical-kinetic program should be individual and not collective, depending on the factors that complete the clinical picture, which is why we designed these block-schemes as a model for approaching the physical-kinetic recovery of the painful lumbar syndrome in middle-aged persons. During the total time an adult has at his disposal per day in 12 hours, most hours are spent on the institution in which he works and the family, a program with negative effects on the state of health of each individual.

The methods used to recover painful lumbar syndrome are those used in kinetotherapy:

➢Exercises for: muscular strengthening, flexibility, stretching, aerobic exercises, exercises for general mobility and aquatic exercises.

➢Coordinated movements with controlled breathing and McKenzie therapy, in which a set of exercises is performed according to a preset classification based on individual assessment.

➢Exercises to increase functional capacity using test procedures and general mobility tests.

To measure pain intensity, we used valid pain scales (for example Scale of Numerical Pain Assessment).

The Williams program is one of the most popular methods used to lower the inferior trunk (Williams Ms flexion exercises). Using lumbar column rehabilitation exercises, pelvis rotations, stretching of paravertebral and psoas iliac muscles, divided into 3 parts distributed, as follows:

- Phase I and Phase II for the sub-acute period: the pain in the decubitus has disappeared, the patient can move in bed without pain, can move through the room, can sit on the chair for more or less time, pain is supported if the column is not mobilized.

- Phase III for the chronic period in which the patient can mobilize the column, the pain being moderate, so that he no longer forces him to adopt lumbar self-locking; in orthostatism and walking, pain may occur after a longer period of time, paravertebral contractions may persist. Dr. Paul Williams first published the program for patients with "Low Back Pain" chronic diseases with degenerative disorders of the vertebrae and intervertebral discs after the onset of lumbosacralgia (1937). Exercises were for patients with acute lumbar lordosis and decreased spaces between vertebrae (visible radiologically between L1-S1). The purpose of the exercises was to reduce the pain and give the stability of the lower train. Dr. Williams said that "the exercises will ensure a normal balance between the flexion group and extension of the postural muscles" [10, 11, 14].

Methodology and organization of research. In order to accomplish the proposed research, we approached a complex of scientific methods and kinetic techniques, aiming to highlight and discover the middle-aged persons suffering from painful lumbar syndrome and, of course, the aspect of the kinetic recovery. Classical, established methods known to most physiotherapy specialists based on certain anthropometric, somatoscopic or functional tests and evaluations were used to monitor the kinetic

recovery period of the middle-aged persons with PLS. The research methods used in the research were: literature analysis, observation method, photo-video method, questionnaire survey method, test method, experiment method, graphic representation method, statistical and mathematical method of data processing and interpretation.

This study was conducted with the participation of 20 subjects, 12 female and 8 male (Figure 1), of whom 5 were initially in the acute phase, 8 were in the sub-acute phase and 7 were in the chronic phase, coming from different social backgrounds. The subjects agreed to participate in our research study of 250 patients diagnosed and suffering from PLS who came at the Kinetotherapy Center FPES, Galati during April 04, 2014 - May 10, 2017. The experiment was carried out in three stages:

Stage I - documenting, analyzing and generalizing specialized data collected from bibliographic materials and pedagogical observation during the teaching hours at the faculty and the kinetotherapy programs applied to the different subjects, according to individual peculiarities and illnesses presented during April 04, 2014 - May 10, 2017.

Stage II - elaboration, distribution and analysis and processing of questionnaires of PLS sufferers (from where we formed the research group) and kinetotherapist and future kinetotherapist (students in the senior year) to determine the applicability of known kinetic treatment methods, the practical deployment of accumulated knowledge, a stage that ran from April 4, 2014 to May 10, 2017.

Questionnaire surveys had a number of 15 iterations (questions) with multiple variants of response and were distributed to a number 125 specialists and future specialists. Another type of questionnaire with 10 items was used for PLS sufferers in the number of 105.

Stage III - experimental argumentation of the efficacy of kinetic treatment of PLS recovery in the middle-aged persons, formulation of conclusions and recommendations, stage that ran from April 4, 2016 - May 10, 2017.

Of the 20 patients: 12 were female, representing 60%, 8 male, representing 40%.

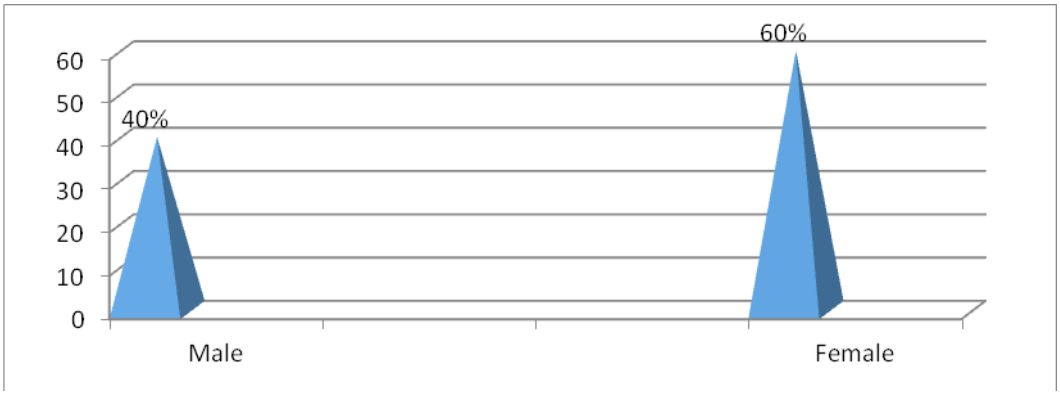

Fig. 1. Gender distribution of the studied group

From the literature, we highlighted the fact that, depending on the duration, the low lumbar pain is considered acute if it takes less than 4 weeks, sub-acute if it lasts 5-12 weeks and is chronic over 12 weeks, but we found that following the application of the kinetic means used in the various kinetic recovery phases of PLS, the acute phase lasted 1 week, the sub-acute phase of the disease lasted 4 weeks and the chronic phase 24 weeks.

In our research of the 20 subjects: 5 were in acute phase, 8 in sub-acute phase and 7 in chronic phase. Patients followed the kinetic rehabilitation treatment at the recommendation of a specialized physician, each of them compiling a file containing: name and surname, age, gender, domicile, spinal mobility test, Laseque test [3, 9].

To determine the degree of physical deficiency, in order to prepare and apply the kinetic program we applied the Laseque test and the Neri test, functional tests specific to the lumbar spine [12, 14].

Research results. Following the methods used in the research we propose a model scheme (a methodological concept) of the kinetic treatment methodology (Figure 2).

The model scheme of the kinetic treatment methodology (Figure 2) presents a series of methods with their related means structured in a precise order but at the same time interchangeable according to the accuracy diagnosis, but also the diseases associated with PLS or the subject. Thus, the scheme can start with the use of the photo-video technique in which the performance of the equipment and the skill of the examiner have a hard word to say, followed by the use of technical and manual methods and last but not least the use of physical exercise found in different forms, positions and parts of the body. It should be noted that this scheme is complemented by the use of psychotherapy as a form of mental education and awareness for the correct application of the kinetic program to avoid recurrence.

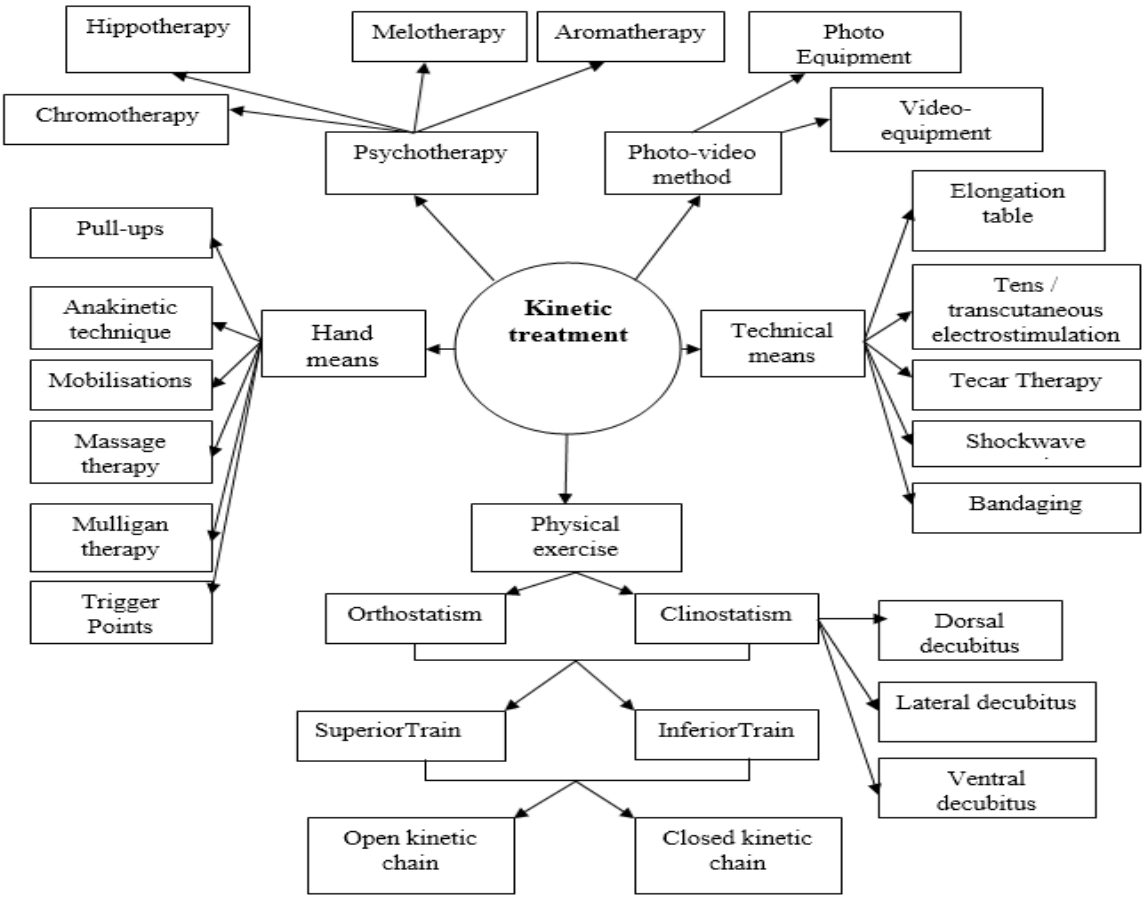

Fig. 2. Schematic / block model of the kinetic treatment methodology

Source: Elaborated by the author

The means associated with kinetotherapy, combined and complex techniques and methods can help achieve this goal due to its beneficial effects, efficacy and the specific means it has on the body [1, 8]. Effective management of chronic (long-term) pain often requires the coordinated efforts of the management team. The prescribing of a treatment for chronic pain includes both pharmacological measures, such as analgesics, antidepressants and anticonvulsants, as well as physical therapy procedures, exercise and psychological measures such as biofeedback [2, 5]. The kinetic means we used in the chronic phase of the disorder were: therapeutic massage of muscular warming, kinetic program with active exercises by appropriate dosing and pause, therapeutic massage predominantly on trigger points in relation to the pain tolerance which are variable as response intensity, mechanical elongation (Photo 1), neuromuscular bandaging on the affected area (Photo 2).

Photo 1. Mechanical elongation

Vertebral elongation transformed the spinal column of the subjects into a more flexible column, the paravertebral muscles that were contracted became more relaxed, stretching and flexibility of the ligaments, the subluxations in the interapophyseal joints were reduced, increased the hydration process at the intervertebral disc and local circulation has been improved [7].

Photo 2. Neuromuscular bandaging

The band we used during the therapy could be worn for 3-7 days. The band is water resistant; can be worn during the shower [13]. The version with increased water resistance can also be worn during swimming or bathing. Most applications are used for the elasticity of the band in relation to the elasticity of the skin.

The effects we achieved by applying the neuromuscular bands were: pain relief, muscle function improvement by muscle tone

regulation, joint function support by proprioceptive neuromuscular stimulation, influencing the position of the joints, influencing the direction of movement, increasing stability, neutralizing congestion of the blood circulation and drainage lymphatic, influencing neuroreflectors.

In Figures 3, 4, where we have the body mass index for men and women respectively, it shows an important evolution for both men and women, the arithmetic mean being lower in both cases at the final stage than in the initial one in men drops from 26.48 to 24.02, and in women from 27.54 to 25.85.

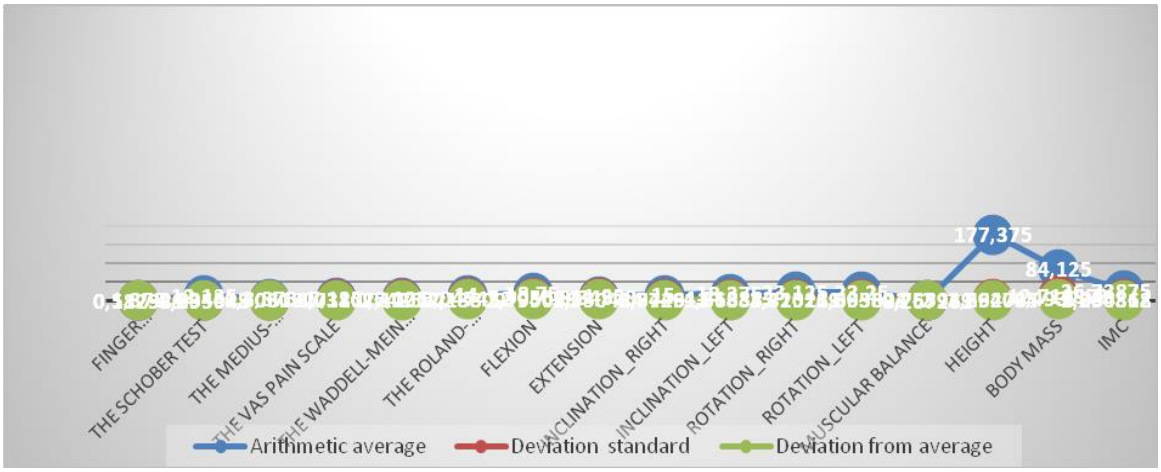

Fig. 3. Differences between initial and final tests (men)

In Figure 4, we plotted statistical differences between initial and final tests applied to the group of women, observing a separation between somatic dimension: height, weight, IMC and somatofunctional parameter : the finger separation test, the Schober test, the medius-ground distance test, the VAS pain scale, the Waddell-Mein questionnaire, the Roland-Morris questionnaire with respect to the arithmetic mean, and in terms of media deviation, the dissociation being almost constant, both in the initial and the final tests.

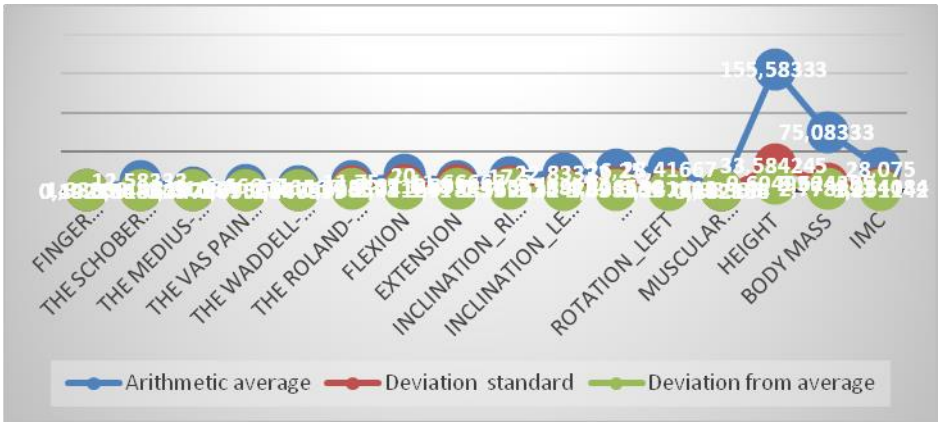

Fig. 4. Differences between initial and final tests (women)

In Figure 4, we see differences between the arithmetic mean and the standard deviation, but also between the arithmetic mean and the deviation from the mean in the tests of the somatometric, functional and motor parameters.

Conclusions. Following the analysis of the results obtained in the evaluation of the somatic and functional parameters after the

six-month model of the kinetic methods and techniques, it can be concluded that there were no statistically significant differences, although on some indicators there are differences and the functional parameters show respiratory and cardiac intensity in the effort.

The results of the correlation analysis performed between the somatometric, somato-functional and motor parameters indicate that the indices have a low value at the beginning of the program, but during the course of the program, they gradually increase from stage to stage and ultimately represent a more progress satisfactory treatment of painful lumbar syndrome.

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