# FALL RISK REDUCTION THROUGH PHYSICAL THERAPY IN THE ELDERLY

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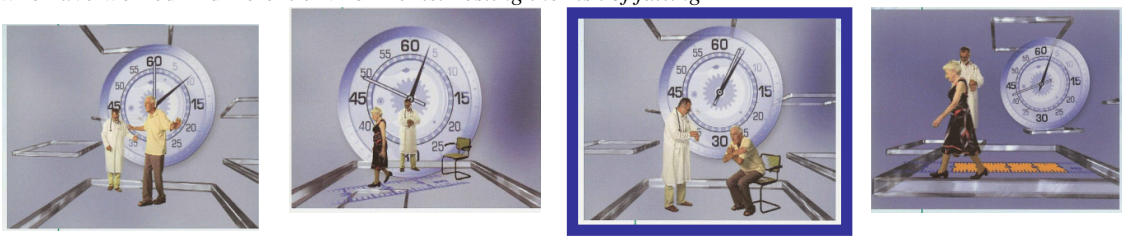
**Abstract:**
The elderly represent an important segment of the total population in the world, including in our country.19,25% of the population is aged over 60, 75% of whom complain about mobility and balance disorders. The management of falls shows that 90% of nonvertebral fractures are inflicted by falling. Almost a third of the total population aged over 65 suffer from one or more falls a year.
Material and method. The trial was conducted by direct observation and tracking of the 120 cases studied during the interval May 2014 - April 2015 within SPINOF Physical Therapy Center of the Lower Danube University of Galati. Out of 20 patients, 12 male patients represented 60% and 8 female patients represented 40%. The patients come from the county of Galati as follows: 11 come from the rural areas, representing 55% and 9 come from the town, representing 45%, all of them pensioners who worked in different environments. Patients were monitored in different evolutionary stages of the above mentioned disease, they received spa, physical and kinetic treatment, specific to each locomotor disorders, to associated diseases in order to promote balance and prevent falls, according to the schedule: each patient had a specific examination record of their locomotor disease and a test of evaluating pain, disability and risk of falling. We have conducted exercises to prevent falls through relearning balance and coordination. 1. "Tai chi" exercises to improve balance and physical stability 2. Through special exercises to prevent falls: strengthening and toning muscles, maintaining the balance, maintenance or recovery of joint mobility and recovery of a correct posture.
The present study confirms the hypothesis that kinetic treatment obviously improves the functional deficit both on the the musculoskeletal system and the disorders of the associated systems (cardio-vascular, respiratory, metabolic and nervous). Therefore, the elderly patient should be integrated into a comprehensive recovery program throughout their whole life, according to the diagnosed disability.

*Keywords:recovery, falling, independence, elderly.*

**Introduction**. The elderly represent an important segment of the total population in the world, including in our country. 19,25% of the population is aged over 60, 75% of whom complain about mobility and balance disorders.


Ageng is a universal process of irreversible evolutive decay characterized by:
- reduction of defense mechanisms in dealing with the environmental conditions - loss of functional reserves;
- a general organic and functional atrophy of some apparatus and systems.
The current concern in geriatrics is not oriented only towards increasing life expectancy, but also to making active people of the third age population. The pathology of the elderly may generate disorders of the locomotor system or may create difficulties in the daily activities of the individual, ADL (Activities of Daily Living - creates functional dependence of the elderly - the frequent presence of associated diseases (pulmonary, metabolic, vascular, neurological) . The management of falling shows that 90% of nonvertebral fractures are inflicted by falling . Almost a third of the total population aged over 65 suffer from one or more falls every year.
**Material and method**. The trial was conducted by direct observation and tracking of the 120 cases studied during the interval May 2014 - April 2015 within the "Salt Lake" resort. Out of the 20 patients, 12 were male, accounting for 60% and 8 were female, representing 40%. The patients come from Galaţi county as follows: 11

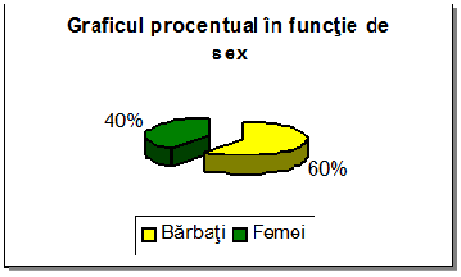
come from the rural region, representing 55% and 9 from the town, representing 45%, all of them pensioners who have worked in different environments. *Testing the risk of falling*

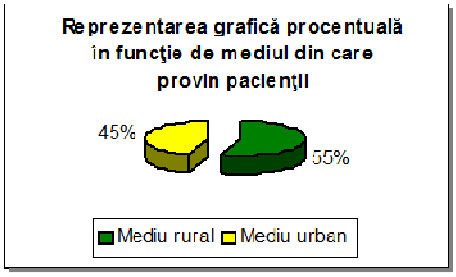


1. "Tandem Standing" Test | 2. „Up & Go" Test | The test for assessing the normal walking speed | 4.Chair Rising Test

Fig. 1.2.3.4.Testing the risk of falling

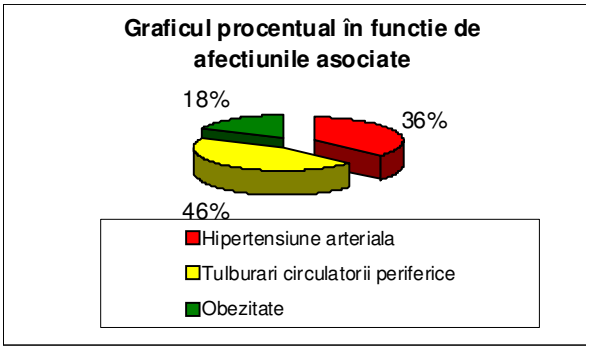
**1. The hypothesis of the study** considers that a kinetic program tailored on the recorded challenges and associated disabilities, individualized and rigorously applied can obtain a normal ADL (Activities of DailyLiving) and reduces the risk of falls, removes the fear of falling, increases self confidence and reduces the functional dependence of the senior people.
**2. The purpose of this paper** is to create kinetic programs meant to reduce the risk of falling, to eliminate the fear of falling, to recover specific weaknesses of the elderly, to establish kinetic prevention and rehabilitation programs for obtaining and maintaining total independence of the elderly patients, setting up complex and progressive kinetic programs that can be performed at home in order to maintain / increase exercise capacity of the elderly to make effort in order to reduce dependence.
**The methodology** we applied comprises three approach stages: ♥ - initial assessment on admission, intermediate and ultimate assessment ♥ - establishment of programs for each condition separately and for each associated condition and ♥ - evaluating the the study benefits ♥ - creating performance programs to reduce the risk of falls and sequelae of the most frequent affections of the LM system.
**3. The objectives** and tasks of this study consist in:
♥ exposing some comments on the issue and management of falls in people presenting locomotor pathologies and associated diseases (pulmonary, metabolic, vascular, neurological) specific to the elderly patients ♥ documentation by reading national and international specialized literature ♥ calculating and tracking the progress of the functional level ♥ comparative data analysis and drawing conclusions that will help in future activities. ♥ creating individualized and prospectiveprogrammes.

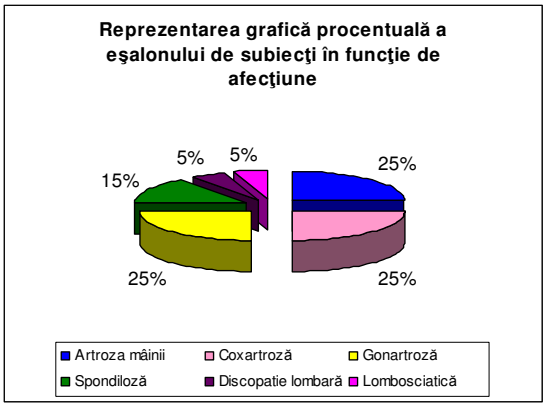



Graphic representation of gender percentage; male(yellow); female(green)
Graphic representation of patients' background percentage (rural and urban)

**The study group** consisted of ♥ 5 patients with osteoarthritis of the hand, representing 25% ♥ 5 patients with knee osteoarthritis, 25% ♥ 5 patients with hip osteoarthritis, 25% ♥ 3 patients with spondylosis, representing 15% ♥ 1 patient with lumbar stenosis, representing 5% ♥ 1 patient with lumbar discopathy, representing 5% ♥ all were tested for risk of falling. The patients were hospitalized ♥ in different evolutive stages of the diseases mentioned above ♥ they were given spa, physical and kinetic treatment, specific to each locomotor condition ♥ for associated diseases and to promote balance and prevent falls, according to the schedule: ♥ Each patient had a record of their specific examination of locomotor diseases and an test of pain evaluation, disability and risk of falling. The degree of disability was established on the basis of:: ♥ WOMAC Functional Index (Western Ontario MacMaster University) –iniţially comprising 6 questions and 5 different degrees of functionality in knee osteoarthritis and hip osteoarthritis. ♥Dreisser 's Functional Index -initially comprising 10 questions and 4 different degrees on hand functionality ♥ balance of motion for - CDL testing mobility of joints and spine by specific functional indexes - F muscle testing through muscle testing - testing and reflexes and walking abilities.




Graphic representation according to associated diseases (hypertension, peripheral circulatory disorders, obesity)
Graphic representation of subjects according to their disorder (hand osteoarthritis, spondylosis, hip osteoarthritis, knee osteoarthritis, lumbar stenosis, lumbar discopathy)

For patients with disabilities caused by osteoarthritis I have drawn up a recovery plan aimed at increasing the mobility of the hip, for ♥ improving walking, climbing and descending stairs ♥ increased mobility in all joints, legs; ♥ increasing endurance in standing position, balancing to avoid falling, walking long distances. Given the associated conditions, the kinetic program was conducted in unloading positions not to increase heart and lung effort. The program included at least 10 exercises for each type of exercise with a double compensation break.

We have conducted exercises to prevent falls. The rehabilitation of balance and coordination. 1. „ Tai chi " exercises to improve physical stability and balance

**1** **2** **3** **4** **5**

**Fig. 1. 2. 3. 4. 5. Tai chi**

1. Leg stretched forward 5 seconds 2.Leg pointing forward x5. 3.One leg stand 5 sec. x5. 4.Tai chi,cursive slow. fig.5

**2.** Through special exercises to prevent falls: strengthening muscle tone and strength, maintaining the balance, maintenance or recovery of joint mobility and recovery of the correct posture.

We conducted training and measurement balance.

Static balance: maintaining increasing difficulty posture, narrowing the support base;

Decrease: strength, proprioception, visual information

Measuring balance: stability disorders, duration, stepping, falls

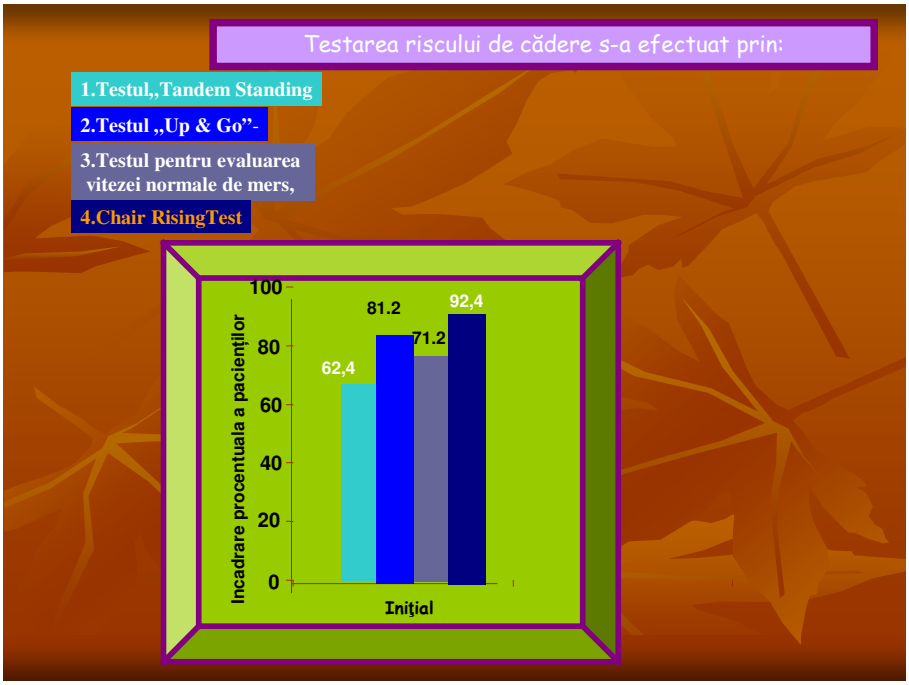
Dynamic Balance: ability to move despite narrowing support base, decreased vision, obstacles, reduced proprioception, disrupting center of gravity.

Dynamic Balance: tandem walking (20 steps), return and repeat, walking on heels, walking on tiptoe, obstacle course, stepping over objects; mobile platforms; walking beam.

Equipment: chairs and free weights, stepping over obstacles, bars, barriers, beams and mirrors.

Fig.3(1.2.3.4.Exerciții de recuperare balans,cădere)

KT improves balance, confidence, mobility and reduces falls in combination with muscle toning workout, resistance (cardiovascular conditioning), flexibility (prevention of contractures); resistive (TH muscular force.): Isometric Isotonic (weights, elastic bands); Isokinetic for balancing (falls), Functionality based (vestibular lessions).
Deconditioning. Prevention: activities outside the bed, in the bed and on a chair, walking, basic diagnostic procedures, regular exercise after discharge; reconditioning programs; resistive exercises, flexibility, strength exercises.

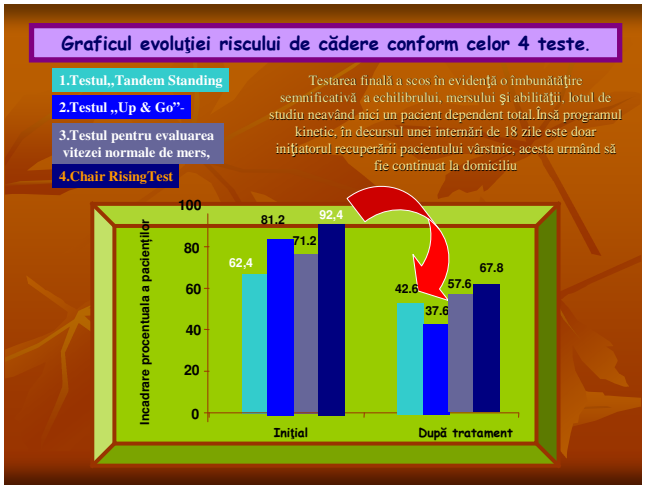



**CDL spondylosis** Applied Kinesiology followed correction of vicious postures, stopping spine deformities evolution, muscle strength recovery in these areas, preventing back muscle hypotrophy, regaining flexibility and mobility of the thoracic cage to maintain pulmonary capacity, caring, as long as possible of vital organs. A kinetic program for vicious position correction, stopping the development of spinal deformities, breathing exercises.

For patients with disabilities caused by knee osteoarthritis my program included exercises with the following aim: maintaining mobility, improved walking, stairs climbing, increasing mobility, increase endurance in long walk through muscle toning. Program mobilization and physical therapy for knee muscle toning.

*Final testing* revealed significant improvements in balance, gait and ability, the study group having no totally dependent patients. 1. "Tandem Standing,, Testing was positive in 62.4% of the patients at the end of the treatment reduced to 42.6% with the benefit of 22%. 2. "Up & Go" Test was positive in 81.2% of the patients reduced to 37.6% at the end of the treatment with a benefit of 42%. 3.The test to assess normal walking speed was positive in 71.2% of the patients reduced to 57.6% at end of treatment with a benefit of 13.6%. 4. Chair Rising Test was positive in 92.4% of the patients at the end of the treatment, reduced to 67.8% with a benefit of 25.6%

**Conclusions**. The present study confirms the hypothisis that the kinetic treatment obviously improves the functional deficit both on musculoskeletal disorders and with the associated disorders (cardio-vascular, respiratory, metabolic and nervous). The elderly patient should be integrated into a comprehensive recovery program throughout their lifetime according to the diagnosed disability. Throughout an 18-day hospitalization, the kinetic program is just initial stage in the elderly patient's recovery. It will be continued at home under the supervision of the territory physiotherapist and medical doctor. It is preferable to be entrusted to the home care service.




Graphic representation of the risk of falling according to the four tests

1. Tandem Standing Test
2. „Up & Go" Test
3. Assessment of normal walking speed test
4. Chair Rising Test
5. Chair Rising Test

Final testing emphasised a significant improvement of the balance, gait and abilities, the study group had no patient that was totally dependent, but the kinetic program throughout an 18-day hospitalization is only the initial step in the process of recovery of the elderly, the nest step consisting in the continuation of the program at the patient's home.

- The fear of falling is a major handicap to the independence of the elderly
- The physical therapist should work with a specialist doctor for the ADL chart of each patient and for each diagnosed disability. In this case the family doctor has the task to detect and quantify the deficit occurred. Subsequently, the specialist and the therapist will draw up charts of by territorial hospitalization for each separate case in order to be processed by the physical therapist in an ambulatory program, in a nursing home, in geriatric nursing homes meant to support the elderly.
- Through this study we intend to alert and attract more subjects of study and more specialities in the recovery of the sick elderly in all its complexity, resulting in the creation of multidisciplinary teams having the same goal: reducing the risk of falls, increasing ADL, motor, social, psychological independence. Deconditioning.
- A geriatric syndrome screening is recommended: falls, incontinence, dementia, depression, pain, visual and auditory disorders;

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