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A provocative operative treatment of 40-days ignored hip fracture: makes history or bad medical history?

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Elderly people come up against a hip fracture after misstepping and eventually falling. Two main types of hip fracture exist: 1) intracapsular (supcapital or pipkin) and 2) extracapsular of intertrochanteric region. A 70-year old woman -previously undergoing a bariatric surgery and malabsorption consequences- presented in our clinic with a 40-days left intertrochanteric fracture misdiagnosed as chronic backache. A quick review, revealed a fall and afterwards constant pain and inability of weight bearing. Patient was then -efficiently and effectively- treated with total hip arthroplasty (THA) with constrained liner. THA consists of femoral stem prosthesis, acetabular component and baring surfaces. Contrained liner is a metal ring that holds femoral head captive in the socket so the patient has less range of motion. This technique is preferable to avoid easier component's dislocation when neuromuscular comorbidities, dementia or deficient abductor mechanism exist. Normally, intramedullary nailing or ORIF with sliding hip screw are first option managements. Final evaluation reveals better outcome. Harris hip score: before the fall (84%), directly after the fall (35,65%), one month post operatively (58,30 %) , 6 months post op (66,5%). Barthel score: entry (20%), exit (65%). FIM score: entry (73%), exit (97%). These, estimate patient's pain and daily functional independence. Proximal femur fractures are up to 10% occult on radiograph. Specialists must have a high index of suspicion, take a good patient history, make a careful examination and question upon the way of managing it. It is not mandatory for a fracture to be treated as it is usually be done. It depends on the patient and her/his special needs.

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Which anti-diabetic therapy is related with most significant hypovitaminosis D in elderly with hip fracture and diabetes mellitus type 2?

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Diabetes mellitus type 2 (T2DM) is an emerging public health issue with high prevalence among older adults. Taking into consideration the great increase in elderly population we can easily understand the impact of this chronic disease and its complications. On the other hand, vitamin D deficiency (VDD) is also a serious public health problem with significant impacts and multiple health effects. The correlation between DM and VDD has been suggested and established from many observational studies, reviews, and meta-analyses. The purpose of this study is to detect if insulin or antidiabetic drugs usage are prone to more severe VDD in diabetic elderly with hip fracture. We retrospectively evaluated 51 elderly patients with low energy hip fractures. Parathormone (PTH) and Vitamin D (VD) blood levels were measured. The sample was divided into two groups based on the type of the treatment of the T2DM. 15 patients were treated with insulin (Group A) and 36 with antidiabetic drugs (Group B). The mean VD levels of the group receiving insulin (Group A) was 11,09 ng/ml ± 5,84 ng/ml, while VD levels in group B was 10,80 ng/ml ± 5,84 ng/ml. Comparison of vitamin D values between the group A and B revealed statistically significant difference (p<0,001, t-test). PTH levels of group A were 41,98 pg/ml ± 26,77, while PTH in group B patients were 64,16 pg/ml ± 55,75 (p<0,001, t-test). Our study supports that elderly with hip fracture treated with insulin have higher VD and lower PTH levels compared with their counterparts. This may be explained due to the correlation of the insulin resistance with low VD levels. When insulin is initiated, this resistance becomes lower, VD increases and PTH reduces. Well-designed clinical studies are required to ascertain if antidiabetic drugs in elderly are associated with higher VDD compared with insulin.

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Transient Osteoporosis of the Hip in Pregnancy

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Transient osteoporosis of the hip in pregnancy is a condition of idiopathic aetiology throughout the last trimester of pregnancy which resolves itself within 4-8 months. The analysis of its progression and its treatment makes a major contribution to the deterrence of fragility fractures of the femoral head, which is a rare occurrence. Within the last 24 years (1998-2022), 18 cases of pregnant women with transient osteoporosis of the hip were reported, the main symptom of which was claudication on the affected hip. The conclusive diagnosis was substantiated by clinical examination and M.R.I. while all blood tests ranged within normal levels. The condition resolved spontaneously within four to eight months after its initial manifestation, by means of weight bearing elimination, while in 12 cases bisphosphonates were also administered. A pregnant patient was diagnosed with Transient Osteoporosis of the hip after a transverse femoral neck fragility fracture, treated with Total Hip Replacement. Transient osteoporosis of the hip in pregnancy is a benign condition which necessitates an early diagnosis and timely treatment in order to avert a likely fragility fracture of the femoral neck in pregnancy.

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Fragility fracture of the hip: the pre-fracture patients' status that contribute to the postoperative functional results

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Introduction: It is widely known that the diagnosis of osteoporosis in elderly people is underdiagnosed before the first major osteoporotic fracture. These osteoporotic patients are commonly suffering from many comorbidities and have not actually been checked or advised from a physician for osteoporosis prevention. The treatment gap is huge and the data from Greece database is limited[1-3].

Purpose: The purpose of this study was to estimate the pre-fracture status of patients who had been sustained a low energy hip fracture.

Materials and Methods: We prospectively selected data about the preoperative status of 118 patients with hip fracture. Data about patients' demographics, history of previous osteoporotic fracture, existence of previous osteoporosis therapy and drug administration were recorded. In addition, clinical assessment tools for sarcopenia and frailty (Sarc-F, Prisma -7, Clinical Frailty Scale), nutrition (Mini Nutritional Assessment -MNA), mobility state (New Mobility Score), mental state (AMMT-S, AMT-4, 4-AT), health state (ASA score, Charlson Index Score), quality of life (EQ-5D) and mortality (Nottingham Hip Fracture score and Sernbo score) were used. The complications of all patients were also recorded.

Results: Apart from 118 patients, 58 sustained a neck fracture fracture, while 60 of them an intertrochanteric fracture. The mean age was 81.5 (65-96) years, and BMI was 26.5 kg/m^2. The patients were separated into two groups; in group A (n=100) there was included patients without a previous osteoporotic fracture, while in group B (n=18) patients with the presence of a previous osteoporotic fracture. The most common comorbidities were diabetes mellitus (Group A; 26.4% vs Group B; 22.2%), cognitive impairment (21.6% vs 38.8%) and psychiatric disorders (12.3% vs 5.5%). The Charlson Index Score was worst in Group B compared to group A (5.7 vs 5.2), as well as the ASA score (2.5 vs 2.4), the NMS (6.5 vs 3.6), the CFS (4.95 vs 4.55), the SARC-F (5 vs 4.6), the Prisma 7 (4.15 vs 3.6) and the MNA (10.35 vs 10.9). Pre-fracture osteoporotic therapy was more commonly administered in Group A compared to Group B (11.1% vs 5.6%). Postoperative complications were more commonly observed in Group A (11.9% vs 11.1%), along with the delirium (9.4 % vs 5.5%).

Conclusion: The patients with a previous osteoporotic fracture have more comorbidities, worst mobility state, increased frailty, increased incidence of sarcopenia and more postoperative complications in comparison with the patients without a previous fracture. The name of the game of osteoporosis is the primary and secondary prevention of fragility fractures, and thus, the physicians should be alert and not underestimate the consequences of osteoporosis.

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Bilateral Subtrochanteric Atypical Femoral Fracture Without Long-Term Bisphosphonate Use: A Case Report

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Introduction: Osteoporosis is a disease that is seen in the elderly population, which is associated with risk of fracture that can lead to disability and mortality. Bisphosphonates have been shown to reduce the risk of osteoporotic fractures (vertebral and nonvertebral)

and are often considered the first choice for the treatment of osteoporosis. The long-term effects of bisphosphonate use on the bone metabolism, however, are unknown and it is postulated that the decreased bone formation with increased bone resorption occurs after long-term treatment. Cases of atypical femoral fractures after long-term use of bisphosphonates have been reported, nonetheless, the occurrences of these fractures in non long-term bisphosphonate exposure has not been explored well in the literature.

Aim: The purpose of this work is to report a case with bilateral subtrochanteric atypical femoral fracture without long-term bisphosphonate use and its decision-making stages in treating these atypical femoral fractures.

Case report: A 57 year old patient was transferred with an ambulance to our hospital because of sharp pain in her right thigh during gait. Clinical examination revealed shortening and external rotation of the right lower extremity. Patient's medical history included osteoporosis and was undergoing therapy with alendronate for the last six months due to this disease. Also stated that due to a heaviness feeling and a pain in the left groin and thigh, she was on analgesic treatment for the last 3 weeks. The radiological examination revealed a subtrochanteric fracture of the right femur with typical morphology of a complete atypical femur fracture; and an increased thickness of the lateral cortex with radiolucent line of the left femur at the subtrochanteric region with typical morphology of an incomplete atypical femur fracture (Figure 1). As a result, the patient underwent an intramedullary nailing of her right femur and was also suggested a conservative treatment to her left femur (Figure 2). Accordingly, the patient was instructed to discontinue the bisphosphonates (alendronate) and to start an anabolic agent (teriparatide). After 4 months of continuous clinical and radiological monitoring, there was no sight of healing in the incomplete atypical femur fracture, hence the patient underwent prophylactic intramedullary nailing operation of the left femur too (Figure 2). As of today, 6 months after the second operation, the patient is still being monitored in our outpatient clinic with regular intervals and going through clinical and radiological examinations.

Figure 1. Anteroposterior radiograph of (a) the right femur and (b) the left femur.

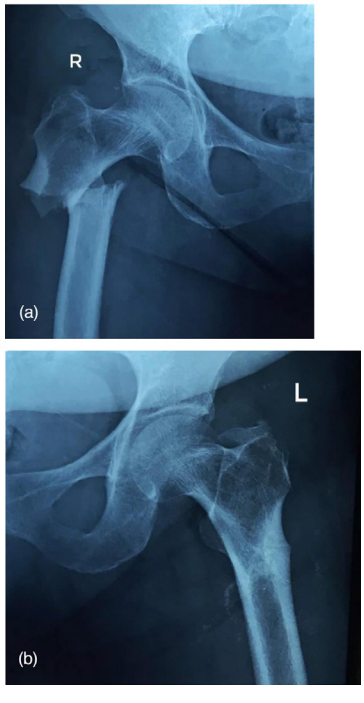
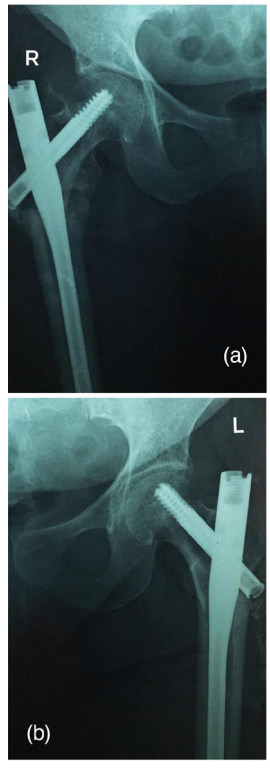


Figure 2. Anteroposterior radiograph of (a) the right femur post operatively and (b) the left femur post-prophylactic nailing



Discussion: There is a great interest in the etiology and pathophysiology of these types of fractures, because there are studies in the literature reporting that atypical fractures can occur without the long-term use of bisphosphonates. The diagnosis of the atypical femur fractures is made based on major and minor criteria, which were originally described by the Task Force of the American Society for Bone and Mineral Research (ASBMR) in 2010/2014. The major features of this type of fractures can be listed as: it is mainly located in the subtrochanteric region and diaphysis; it lacks trauma history and comminution; and it presents itself in transverse or short oblique configuration. According to literature, the complete fractures contain medial spikes and incomplete ones affect only the lateral cortex. Minor features involve periosteal reaction, increased cortical thickness, prodromal symptoms, bilateral occurrence, and delayed healing. In most cases, the treatment of both complete and incomplete atypical femoral fractures entails surgical fixation. On the other hand, in cases where there is no pain, observation is recommended.

Conclusion: This abstract presents a case of a bilateral atypical femur fracture and intends to highlight that this type of fractures could appear without the long-term use of bisphosphonates. Furthermore, the case emphasizes the importance of bilateral femur imaging when an atypical femur fracture occurs.

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Incidence of vitamin D deficiency in relation to bone density

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Introduction: Vit. D is related to bone metabolism and the correction of its levels in the blood is part of the treatment in both Primary and Secondary Prevention of Fragility Fractures.

Objective: We conduct a study of the levels of Vit. D in patients undergoing bone mineral density (BMD) measurement in a Primary Public Health Care Service.

Material & Methods: We studied the data of patients who underwent control by BMD measurement of Vit D [25 (OH) D3] levels in the blood. Demographics, co-morbidity (Charlson index), history of fragility fracture, previous osteoporotic treatment, FRAX score and any treatment for osteoporosis were also recorded (Table and Figure).

Figure 1. Histogram with biochemical characteristics in patients with D3<20 ng/mL between Group A and B.

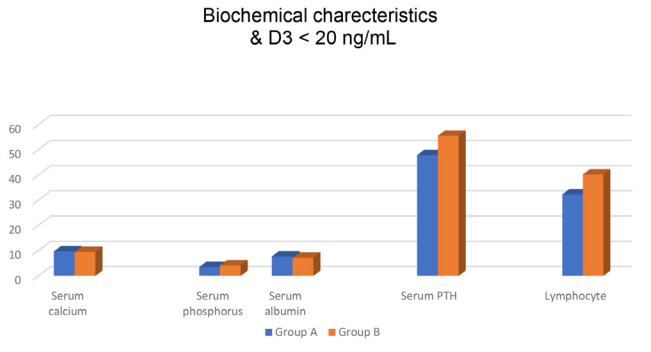

Table 1. Short comparison between Group A and Group B [BMI: Body mass index; FF: Fragility Fracture; BMD: Bone Mineral Density; HF: 10 years probability for Hip Fracture; MOF: 10 years probability for Major Osteoporotic Fracture].

	Osteopenia (A)	Osteoporosis (B)
Number of patients (n)	37	56
D3 (ng/mL); mean±SD	23,37±7,59	24,057±10,28
D3<20 ng/mL; n (%)	13 (35,1)	22 (39,2)
Age, years & D3<20 ng/mL; mean±SD (range)	68,5±8,8 (54–84)	66,4±7,4 (53–83)
BMI (kg/m^2) % & D3<20 ngmL; n (mean), range	31,52 (23,8–48,08)	28 (18,3–36,16)
Medication & D3<20 ng/mL; n, range	3,25 (1–7)	2,1 (0–7)
Charlson index & D3<20 ng/mL	2,8	2,6
T-score Spine & D3<20 ng/mL; mean±SD	-1,7±1,07	-2,89±0,36
BMD Spine & D3<20 ng/mL; mean±SD	0,93±0,13	0,8±0,07
T-score Hip & D3<20 ng/mL; mean±SD	-1,5±1,08	-1,97±0,89
BMD Hip & D3<20 ng/mL; mean±SD	0,84±0,11	0,79±0,13
FRAX MOF (%) & D3<20 ng/mL; mean±SD	11,37±5,1	9,78±7,3
FRAX HF (%) & D3<20 ng/mL; mean±SD	3,05±2,1	3,43±4,1
Previous FF & D3<20 ng/mL; n (%)	4 (10,8)	2 (3,5)

Results: Of the 94 patients, n:37 (39.3%) had osteopenia (Group A) and n:56 (59.6%) had osteoporosis (Group B). In Group A the mean D3 was 23.37±7.59 ng/mL while in Group B 24.057±10.28 ng/mL (Table). D3<20 ng/mL in Group A had 13 patients (35.1%) and in Group B had 22 patients (39.2%) (Table). In patients with a previous fracture D3 was abnormal in n:6, 6.38% (both groups) (Table 1). Of the patients with a fracture history only n:8, 8.51% (both groups) received treatment for osteoporosis. The FRAX score (major osteoporotic fracture, MOF) in patients with D3 deficiency was 10.2±6.5 (mean; both groups) and in those with normal D3 values was 9.9±8.03 (mean; both groups) (Table). In the two groups there are no particular differences as far as laboratory results and D <20 ng/mL are concerned (Figure 1).

Conclusion: D3 level is associated with fracture risk. Many patients with a previous fracture are not treated for low D3 levels.

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The deficiency of osteoporosis in medical treatment in primary and secondary prevention in primary health care

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Introduction: It evidence that in many countries there is a treatment gap of osteoporosis in both Primary and Secondary Fragility Fracture prevention.

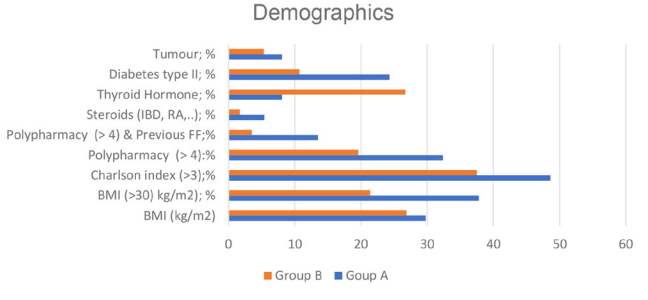
Objective: The recording of the deficit in the medication of osteoporosis, in both the Primary and the Secondary prevention in the structure of the Primary Public Health Care Service.

Material & Methods: We studied the data of patients who underwent control by measuring bone density (BMD) measurement of Vit D [25 (OH) D3] levels in the blood. Demographics, co-morbidity (Charlson index), history of fragility fracture, previous osteoporotic treatment, FRAX score and any treatment for osteoporosis were also recorded (Table 1 and Figure 1).

Table 1. Short comparison between Group A and Group B [BMI: Body mass index; FF: Fragility Fracture; BMD: Bone Mineral Density; HF: 10 years probability for Hip Fracture; MOF: 10 years probability for Major Osteoporotic Fracture].

	Osteopenia (A)	Osteoporosis (B)
Number of patients (n)	37	56
Age, years. mean±SD (range)	67,02±8,7 (54-84)	64,78±9,2 (51-90)
T-score Spine; mean±SD	-1,76±0,92	-2,56±0,425
BMD Spine; mean±SD (gr/cm²)	0,85±0,43	0,81±0,07
T-score Hip; mean±SD	-1,64±1,14	-1,94±0,83
BMD Hip; mean±SD (gr/cm²)	0,82±0,1	0,98±0,11
Previous FF & T-score Spine; mean±SD	-1,24±1,43	-3,2±0,633
Previous FF &T-score Hip; mean±SD	-2,14±1,40	-2,7±0,634
FRAX HF (%); mean±SD	2,94±3,7	3,24±3,8
FRAX MOF (%); mean±SD	9,61±5,84	10,28±8,54
FRAX NOF medium risk (5-7%)	6 (16,2%)	11 (19,6%)
FRAX MOF >7,5% (high)	22 (59,4%)	25 (44,6%)
FRAX MOF >20%	2 (5,4%)	5 (8,9%)

Figure 1. Histogram with demographics data of Group A and B.



Results: Of the 94 patients, n:37 (39.3%) had osteopenia (Group A) and n:56 (59.6%) had osteoporosis (Group B) (Table). The FRAX score (major osteoporotic fracture, MOF), on average, for osteopenic was 9.61%±5.84% and for osteoporotic patients was 10.28%±8.54% (p: 0.34) (Table). Previous fragility fracture in Group A (n: 7, 18.9%) and in Group B (n: 9, 16%). They had received treatment which was discontinued in Group A (n: 17, 45.9%) and in Group B (n: 38, 67.8%). Group A had worse Charlson index and received more drugs (Figure). In the Multiple Regression analysis based on the Multiple Regression model, the bone mineral density of the lumbar is statistically related to BMI (p: 0.0096), polypharmacy (p: 0.0456), year of age (p: 0.0768) and with the treatment they were taking and discontinuing (bisphosphonates, p:0.0891 and denosumab, p:0.0793).

Conclusion: The treatment gap in osteoporosis medication in both Primary and Secondary prevention as seen in the structure of Primary Health Care is significant.

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Prevalence of frailty in elderly with fall related hip fracture

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Frailty is a geriatric syndrome that carries an elevated risk of significant decline in health and function among older people. It has been found to be an independent risk factor for fall related fractures, having serious consequences in elderly's independent living. Early identification of elderlies at risk may lead to lowering fall risks and promoting physical well-being. The purpose of this study was to assess the prevalence of frailty in elderly Greek patients that had a fall related hip fracture and to assess their muscle strength and functionally ability. 284 consecutive elderly patients that were admitted to the Orthopedic department of Evaggelismos General Hospital of Athens from September 2019 till June 2020 were evaluated and 97 (♂29, ♀76) were eligible (inclusion criteria: falls related hip fracture, cognitive status that allowed assessment, living independently) and included in the study. Clinical Frailty Scale was used as a screening tool for Frailty after interviewing the patient and his/her relatives Handgrip dynamometry was used for evaluation of muscle strength and Barthel index for functional ability. Frailty was identified in 30% of patients, while elderly in pre-frail reached as well a 30%. Grip strength was 13.7±5 kg (mean±SD). Muscle strength was significantly reduced in frail patients compared to non-frail (mean±SD: 12.3kg±3.8 vs 17.55kg±8.8, p<0.05). Additionally, functional ability was also significantly reduced between the two [median (IQR):75(46-90) vs 97.5(67-100), p<0.05]. Frailty was present in a significant percent and was accompanied by reduced muscle strength and functional ability. The results support the need to raise awareness regarding the syndrome of frailty. Further research is needed in order to carefully assess the burden of frailty and its consequences in the daily living of elderly.

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The influence of Adherence on the effectiveness of a Home-based Exercise Programme (McHeELP) for older adults to improve functional capacity

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Introduction: Exercise is widely recognized as necessary for primary and secondary prevention of falls[1]. Adherence to exercise in the older adults appears to be influenced by several factors such as socioeconomic status, health and co-morbidity, motivation, physical function, psychology and exercise location[2]. The changes that take place with aging in the musculoskeletal and nervous system lead, among other things, to a decrease in the functional capacity of the elderly and falls[3].

Purpose: The aim of this research study was to explore the influence of adherence on the effectiveness of the modified exercise programme "Motor control Home ergonomics – Elderly's Prevention of falls" (McHeELP), to improve the functional capacity of the elderly and prevent falls.

Method: Community-dwelling adults participated, following an invitation of interest. Criteria for inclusion were age 65 years and over, walking and living independently in the community. Exclusion criteria included a) patients suffering from neurological or/and autoimmune diseases c) medical conditions that could affect ability to complete objective assessments and/or exercise intervention and b) cognitive impairment. All participants signed an informed consent form prior to their inclusion.

Baseline information was collected by interview at study start, including a short introduction of the exercise programme, medical history and history of falls (last 12 months). Participants were assessed at baseline and immediately post-intervention (12th week). Measures included Timed up and Go test, 4 meters walking test, Sit-To-Stand test (30´´), Tandem stance test (heel-toe), Functional Reach Test (FRT), Lord test, Foot tapping test, the heel to shin test. Fear of falling was assessed using the Falls self-Efficacy International Scale (FES-I) and functionality via the Lower Extremity Functional Scale (LEFS). Adherence was monitored via a self-reported exercise calendar and was recorded on the Exercise Adherence Rating Scale[4] (EARS) every 4 weeks (4th, 8th, 12th).

All participants performed the McHeELP exercise programme for 12 weeks and were re-evaluated. The McHeELP programme includes a package of motor control exercises, which are divided into 6 domains, namely: "Warm up", "Serial skills", "Cognitive skills", "Balance", "Sensory strategy", and "Dynamic control"[5]. Participants received a personalized home exercise programme (in booklet), which performed 2 times per week for 12 weeks. They performed a total of 10 exercises in each session. The physiotherapist supervising the exercise program visited each participant's home every 4 weeks in order to instruct him/her on how to perform exercise properly and make adjustments regarding the progression of the exercises. Progression was based the patient's abilities and/or observed movement control, fatigue and the functional level of participants.

Results: Thirty-three (33) people were eligible to participate. A total of twenty-five (25) participants (7 men and 18 women) with a mean age of 72.28±7.02 years completed the study. The 25 participants, were considered compliant, as they had performed the exercise program during 2/3 of the predetermined time of the intervention[6]. The self-report logs showed that most seniors responded and completed the programme, with minimal deviations from the recommended ones. The exercise calendar and the EARS scale confirm 90% and 86.7% adherence rates, on average, over the 12-week period. The intervention had a positive effect and reduced the fear of falling (FES I p=0.007, SD=3.74), improved functional capacity (LEFS p=0.003, SD = 6.73, TUG p=0.008, SD=2.12), lower limps strength STS (p=0.044, SD=1.97), balance (Tandem p=0.018, SD=3.74, FRT right/left p=0.299/0.293, SD=4.32/5.57), coordination (Foot Tapping right/left p=0.000/0.001, SD=5.56/5.62) and proprioception (LORD test p=0.005, SD=0.73). Pearson (r) correlations between EARS scale and objective tests, were significant only for TUG test (r=0.5).

Conclusions: The statistically significant differences, observed in all relevant tests, confirm review data7, which indicate that the improvement of motor control, balance and functional capacity of the elderly is possible through an exercise programme, which includes dynamic balance and gait exercises, as well as functional skills, immediately after the intervention. The McHeELP exercise programme, proposed and performed, was structured, supervised through frequent communication, and personalized to cover objective deficits[5,8,9]. Adherence is considered a critical factor for the success of an exercise programme both in the field of research and in clinical practice, as it has already been proven that exercise and physical activity have a positive effect on falls prevention, well-being and longevity.

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