

examination, laboratory findings and radiological findings, especially the results from DXA – in line with the criteria of the American College of Rheumatology. We have also treated osteoporosis with the adequate medication, which includes antiresorptive drugs. What we have put emphasis on has been the comparison between the results of DXA (bone density), the level of 25(OH)D3 and calcium in blood from 2018 to the equivalent data after medication in 2019.

**Results:** During this survey, we noticed that patients, whose calcium and 25(OH)D3 levels were corrected at the same time with the appropriate medication for osteoporosis, had a real improvement of the bone density. 70% of the patients had an increasing level of the bone density. At 20% of them, it remained the same and 10% of them had a minor decrease in the level of the bone density. Moreover, 85% of these patients had an increase in the level of 25(OH)D3 in blood and only 15% of them had a decrease. It resulted that 65% of these patients had an increasing level of calcium in the blood. At 6% of them, it remained unchanged and 32% of them was noted to have a lower level of calcium in their blood.

**Conclusion:** This study provides valuable evidence about the association of 25(OH)D3 and calcium levels with osteoporosis. The correction of 25(OH)D3 and calcium levels have not only had positive results in the improvement of the bone density level (DXA), but also in the improvement of life of the patients diagnosed with osteoporosis, 60% of whom have had a progression on a three-parameter level.

#### P415

##### EFFECTS OF CITRULLINE ALONE OR COMBINED WITH EXERCISE ON MUSCLE MASS, MUSCLE STRENGTH AND PHYSICAL PERFORMANCE AMONG OLDER ADULTS: A SYSTEMATIC REVIEW

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**Objective:** To establish the potential of citrulline supplementation (CIT) combined or not with exercise on muscle function and physical performance via a systematic review of randomized controlled trials (RCTs) in humans aged 50 years and older.

**Methods:** The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement has been followed. Medline (via Ovid), Cochrane central register for controlled trials (CENTRAL via Ovid) and Scopus databases Medline (via Ovid) have been searched. Studies selection and data extraction have been performed by two researchers independently. Methodological quality of each included studies was assessed using the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool

**Results:** Based on PRISMA guideline, 103 references have been identified. Among this number, only 6 RCTs (250 participants) matched the inclusion criteria and were included in the present systematic review. Among the included studies, 5/6 reported beneficial effects of CIT on muscle mass. Then, 4/6 studies reported CIT effects on muscle strength but also that CIT when combined to exercise results in further improvements in upper muscle strength. Finally, 3/6 studies reported beneficial CIT effect on physical performance and suggested that CIT with exercise displayed greater improvements in walking speed than exercise alone. The overall quality of studies was rather high.

**Conclusion:** CIT supplementation seems to be able to improve muscular and physical factors in frail elderly people (malnourished, hypertensive, obese, dynapenic-obese) compared to placebo. More importantly, CIT combined to exercise is more efficient than exercise or CIT alone. However, due to the small number (6) and heterogeneity (dose, duration, population) of the studies realized in older adults, further studies are needed to confirm its promising potential.

#### P416

##### THE EFFECTS OF GAMOTION (A GIANT EXERCISING BOARD GAME) ON PHYSICAL CAPACITY, MOTIVATION AND QUALITY OF LIFE AMONG NURSING HOME RESIDENTS: A RANDOMIZED CONTROLLED TRIAL

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**Objective:** In 2017, Mouton *et al.* highlighted promising results of a giant exercising board game on ambulatory physical activity and a broader array of physical and psychological outcomes among nursing home residents. However, some limitation of this game should be acknowledged (e.g., too long, too bulky, exercises too simple). Taking into account these weaknesses, we decided to develop and validate a new version of a giant exercising board game: the GAMotion. The aim of this study was to evaluate the impact of GAMotion on physical capacity, motivation and quality of life among nursing home residents.

**Methods:** A one-month randomized controlled trial was performed in two comparable nursing homes. Eleven participants (71.63±8.15 y; 7 men) meeting the inclusion criteria took part in the intervention in one nursing home, whereas 10 participants (84±7.57 y; 4 men) were assigned to the control group in the other institution. The GAMotion required participants to perform strength, flexibility, balance and endurance activities. The assistance provided by an exercising specialist decreased gradually during the intervention in an autonomy-oriented approach based on the self-determination theory (Ryan & Deci, 2002). Physical capacity (i.e., quantitative evaluation of walking using Locomotrix; grip strength using Jamar dynamometer; knee extensor isometric strength using MicroFET2; fall risk using Tinetti test; dynamic balance using timed up and go test (TUG) and physical abilities using SPPB test), motivation (i.e., using Behavioral Regulation in Exercise Questionnaire-2) and quality of life (i.e., using EQ-5D questionnaire) were assessed at baseline and at the end of the intervention. A two-way repeated-measure analysis of covariance (ANCOVA) was used to assess time\*group (intervention vs. control group) effects.

**Results:** Globally, during the intervention period, the experimental group displayed a greater improvement in symmetry of steps (p=0.04), Tinetti score (p<0.0001), TUG (p=0.02), SPPB (p<0.0001), knee extensor isometric strength (p=0.04), grip strength (p=0.02), 3 domains of the EQ-5D (i.e., mobility, self-care, usual activities: p<0.0001) and intrinsic motivation (p=0.02) compared to the control group.

**Conclusion:** The effects of GAMotion on physical capacity, motivation and quality of life of nursing home residents confirm the results obtained with the previous version of the giant exercising board game.