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## Effects of perturbation-based balance training on bone mineral content in older adults with osteopenia

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**Background:** Fall is considered as a main cause of accident injuries in older adults, especially in people with lower bone mineral density, i.e. osteopenia or osteoporosis. Treadmill perturbation training can not only improve the ability of postural control but also increase the amount of load exercise, which is beneficial for maintaining bone mineral content.

**Purpose:** The purpose of this study was to determine the effects of perturbation-based balance training on bone mineral content in older adults with osteopenia.

**Methods:** Seven older adults with osteopenia (age: 69.43±3.51 years; height: 156.51±5.76 cm; weight: 58.56±5.76 kg; T-score: -1.64±0.73; Bone mineral content: 2.24±0.46 kg) participated in this study. Data of body composition was collected using a multi-frequency bio-electrical impedance analyzer in the pre-/post-test. Participants received eight-week balance training for two sessions per week, one hour per session. A split-belt balance perturbation treadmill and the modular interactive tiles system were used in the training. The treadmill training includes unexpected antero-posterior and side-to-side perturbation during quiet standing and treadmill walking.

**Results:** After the eight-week training, the bone mineral content (2.36±0.49 kg, p=0.001) and segmental lean mass of right lower extremity (6.86±1.70 kg, p=0.022) increased significantly. No significant difference was found in other segmental lean mass, skeletal muscle mass, fat free mass and fat.

**Conclusions:** Perturbation-based balance training might improve bone mineral content in older adults with osteopenia, which is the risk factor for falls and fractures.

### Biography

Pei-Yu Su completed her Bachelor's degree and became a graduate student of Physical Therapy at National Taiwan University in Taiwan (2015). She is a licensed Physical Therapist in Taiwan. She is the Director of the Headquarters of Asia Physical Therapy Student Association. She currently works with Dr. Wei-Li Hsu in the Movement Science Laboratory. Her research interests are motion analysis and osteoporosis.

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