The Impact of Resistance Exercise Training on Daily Activities and Physical Functions in Osteoporosis Patients

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Abstract:

Background: Taiwan is experiencing rapid population aging, with osteoporosis affecting a significant proportion of individuals over 50—38.3% of women and 23.9% of men, according to the National Nutrition Survey (2005–2008). Effective prevention and management strategies are crucial. Studies have demonstrated that resistance training enhances daily activities, improves physical functions, and reduces exercise-related injuries, thereby lowering fracture risks. With increasing demands on healthcare resources and a shift toward home-based care, implementing resistance exercises at home is essential to improving patients' quality of life and reducing healthcare dependence.

Objectives: This study investigates the effects of resistance exercise training on daily activities and physical functions in osteoporosis patients compared to those who do not engage in such training.

Methods: A systematic literature search was conducted across four electronic databases. The study applied the PICOT framework, where:

- P (Population) includes patients diagnosed with osteoporosis.
- (Intervention) involves resistance training exercises.

- C (Comparison) contrasts resistance training with general health education or stretching exercises.
- O (Outcome) assesses improvements in daily living capabilities and physical functions.
- T (Timeframe) focuses on home care settings.

The search strategy incorporated the following keywords: osteoporosis AND systematic review OR randomized controlled trial AND 2017–2022 AND resistance training OR resistance exercise.

Results: Three studies met the inclusion criteria, confirming that a three-month resistance training program significantly improved lower and upper limb muscle strength, balance, and mobility while reducing the fear of falling in elderly women with osteoporosis and vertebral fractures. However, no significant improvements were observed in habitual walking speed or overall quality of life. These findings suggest that short-term resistance training effectively enhances muscle strength, lowering fall risk.

Conclusions: Resistance and balance training are safe, effective, and cost-efficient methods for enhancing muscle strength and reducing fall-related anxiety in osteoporosis patients. However, one study primarily focused on healthier individuals, excluding patients with contraindications to exercise or cognitive impairments. This underscores the need for personalized assessments in clinical applications. Additionally, the validity of findings could be strengthened by incorporating objective measures such as bone mineral density and serum calcium and vitamin D levels. Given the lower bone density in osteoporosis patients, professional supervision in resistance training is essential to prevent exercise-induced injuries.

Keywords:

Osteoporosis, Resistance Training, Physical Function, Home-Based Exercise, Fall Prevention.