

BONE DENSITY AND PHYSICAL FUNCTION IN POSTMENOPAUSAL WOMEN AFTER A 12-MONTH WATER EXERCISE INTERVENTION

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ABSTRACT

Exercise may be the most effective strategy to reduce osteoporotic fractures in older adults because of its potential to reduce both bone loss and fall risk. It is unclear whether water exercise is an effective strategy to reduce fracture risk in postmenopausal women.

PURPOSE: To examine the effects of a 12-month shallow water exercise program on bone mineral density (BMD) and physical function in postmenopausal women. **METHODS:** We recruited 59 women (≥ 5 years past menopause; 27 exercisers and 32 controls) and evaluated subject characteristics (weight and age), BMD (spine, total hip, femoral neck) by dual energy x-ray absorptiometry, and physical function (leg power, arm endurance, cardiorespiratory fitness, flexibility) at baseline and 12 months. The exercise group participated in a 45-minute shallow water exercise class 3 times per week for 12 months, while the control group was asked to maintain initial activity levels. **RESULTS:** Using ANCOVA (covariates: initial BMD and weight) BMD difference scores at the spine, total hip, and femoral neck were similar between exercisers and controls after the 12-month intervention ($p=0.14-0.31$). However, one-sample t-tests revealed that over the 12 months, femoral neck BMD decreased 1.7% in controls ($p<0.01$) but did not change in exercisers ($p=0.98$). Using ANCOVA to evaluate difference scores in physical function (covariates: initial weight and age), exercisers exhibited greater cardiorespiratory fitness after 12 months of water exercise than controls ($p=0.03$), but leg power, arm endurance, and flexibility were not different between groups. One-sample t-tests revealed that exercisers increased leg power (+14.1%, $p=0.01$), flexibility (+11.4%, $p<0.01$), and mobility (+13.4% to 17.4%, $p<0.01$), while values for controls did not change (i.e. were not different from zero). One-sample t-tests also demonstrated that balance decreased 16.1% in controls ($p=0.03$), but did not change in exercisers (-4.0%, $p=0.47$). **CONCLUSION:** Our results provide *preliminary* evidence that shallow water exercise maintains femoral neck BMD in postmenopausal women. Furthermore, we conclude that shallow water exercise is an effective means of maintaining and improving physical function as women age.

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