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# Exercise effects on bone mineral density, falls, coronary risk factors, and health care costs in older women: the randomized controlled senior fitness and prevention (SEFIP) study.

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## Abstract

**BACKGROUND:** Physical exercise affects many risk factors and diseases and therefore can play a vital role in general disease prevention and treatment of elderly individuals and may reduce costs. We sought to determine whether a single exercise program affects fracture risk (bone mineral density [BMD] and falls), coronary heart disease (CHD) risk factors, and health care costs in community-dwelling elderly women.

**METHODS:** We conducted a randomized, single-blinded, controlled trial from May 1, 2005, through July 31, 2008, recruiting women 65 years or older who were living independently in the area of Erlangen-Nuremberg, Germany. In all, 246 women were randomly assigned to an 18-month exercise program (exercise group) or a wellness program (control group). The exercise group (n = 123) performed a multipurpose exercise program with special emphasis on exercise intensity; the controls (n = 123) focused on well-being with a low-intensity, low-frequency program. The main outcome measures were BMD, the number of falls, the Framingham-based 10-year CHD risk, and direct health care costs.

**RESULTS:** For the 227 women who completed the 18-month study, significant exercise effects were observed for BMD of the lumbar spine (mean [95% confidence interval (CI)] percentage of change in BMD [baseline to follow-up] for the exercise group: 1.77% [1.26% to 2.28%] vs controls: 0.33% [-0.24% to 0.91%]; P < .001), femoral neck (exercise group: 1.01% [0.37% to 1.65%] vs controls: -1.05% [-1.70% to -0.40%]; P < .001), and fall rate per person during 18 months (exercise group: 1.00 [0.76 to 1.24] vs controls: 1.66 [1.33 to 1.99]; P = .002). The 10-year CHD risk was significantly affected in both subgroups (absolute change for the exercise group: -1.96% [95% CI, -2.69% to -1.23%] vs controls: -1.15% [-1.69% to -0.62%]; P = .22), with no significant difference between the groups. The direct health care costs per participant during the 18-month intervention showed nonsignificant differences between the groups (exercise group: 2255 euros[95% CI, 1791 euros-2718 euros] vs controls: 2780 euros [2187 euros-3372 euros]; P = .20).

**CONCLUSION:** Compared with a general wellness program, our 18-month exercise program significantly improved BMD and fall risk, but not predicted CHD risk, in elderly women. This benefit occurred at no increase in direct costs.

**TRIAL REGISTRATION:** clinicaltrials.gov Identifier: NCT00267839.

## Comment in

Evidence regarding the benefits of physical exercise. [Arch Intern Med. 2010]

Compared to a general wellness programme, an 18-month exercise programme for older women improves bone mineral density and fall risk but has similar improvements in predicted coronary heart disease risk. [Evid Based Nurs. 2010]

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