



## Exercise Biochemistry Review

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### Effect of resistance training on functional fitness and bone mineral density in elderly women

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**Objective** Try to carry out the intervention experiment of the strength exercise of the elderly in the community, aiming to provide theoretical and data basis for the daily strength exercises of the elderly in China.

**Methods** Recruiting 18 elderly female volunteers in Xicheng District, Beijing, required independent living ability and were willing to participate in the experiment. They were randomly divided into intervention group (N=9, 62.0±6.0 years) and control group (N=9, 63.0 ± 4.8 years). On Tuesday afternoon and Thursday morning, under the leadership of a professional coach, follow the planned "Resistance Exercise Plan" to carry out resistance training. Each practice time is about 90min for 9 weeks. The exercise intensity control is divided into two phases: the first phase lasts for one week, mainly the learning and adaptation phase of the action, and the heart rate control in the 30%~40%HRR or RPE 10 subscale is 4 (a little easy); The stage lasts for 8 weeks of the medium-intensity practice phase, the heart rate control in the 40%~60%HRR or RPE 10 subscale is 5~6 (moderate, slightly strenuous).

**Results** Intervention group before and after experiment, the grip strength (25.0±5.0 VS 26.8±3.9 kg, P<0.05) and the 30s arm curl test (23.1±5.2 VS 25.4±4.0 repetitions, P<0.05) increased. Five sit-up tests (6.99±2.01 VS 6.51±2.00 s, P<0.05) and the 8-foot standing walk (5.13±1.03 VS 5.07±1.01 s, P<0.05) were all shortened. The bone density T value (-1.3±0.4 VS -1.0±0.4, P<0.05) increased. After intervention, the intervention group compared with the control group, grip strength (26.8 ± 3.9 VS 22.1 ± 4.5 kg, P <0.05), 30s arm curl test (25.4 ± 4.0 VS 22.1 ± 3.0 repetitions, P <0.05) increased. Five sit-up tests (6.51 ± 2.00 VS 6.94 ± 1.05 s, P < 0.05) and 8 feet of standing walk (5.07 ± 1.01 VS 5.27 ± 0.97 s, P < 0.05) were all shortened. Bone density T value (-1.0 ± 0.4 VS -1.4 ± 0.4, P < 0.05) increased. There was no significant change in the 30-second chair stand test.

**Conclusions** Through 9 weeks of progressive resistance exercise, the experiment made the upper limb explosive force, upper limb muscle endurance, lower limb explosive power, flexibility and dynamic balance enhanced, and bone density increased. The enhancement of lower limb endurance is not obvious, which may be the reason for short experimental time and small exercise intensity of lower limbs.