

Strength training is very important indeed:

- It increases bone density, strength and size.<sup>445,446</sup>
- It increases muscular strength making it easier to lift things without injury, even in older people.<sup>447</sup>
- It reduces back and joint pain as a result of increased muscular strength.<sup>448</sup>
- It improves the HDL/LDL fat ratio and other indicators of cardiovascular disease.<sup>449</sup>
- It reduces blood pressure, even in older people.<sup>450</sup>
- It decreases body fat making you look good and feel good.
- In men it increases muscle mass and size and temporarily increases testosterone levels.<sup>451</sup>

Many women, it is true, think that weightlifting is something practised only by men who read 'Men's Health' magazine, or perhaps by Bulgarian women shot-putters or female weightlifters who look like something out of a 1960s sci-fi film. Never fear! When men lift weights it provides a surge of testosterone that builds up the size of their muscles, but that doesn't happen to women, or at least only to a small extent.<sup>452</sup> For you women it will indeed firm up and strengthen your muscles and maintain or increase your bone strength, but what it will also do is decrease your body fat and give you a bikini-shaped figure without your having to live off lettuce and zero-fat cottage cheese. What's more, weightlifting will do this as fast or faster than running on a treadmill or dodging round pedestrians while you jog along busy streets during the cold dark months of winter. And if you must know, there are even pink dumb-bells and pink ankle and wrist weights made especially for the girls.

For older women strength training is especially important to prevent osteoporosis and the risk of breaking one's hip or another bone in a fall. A group of 56 post-menopausal women undertook ten resistance exercises on a regular basis for a year, half of them doing a few repetitions under heavy loads, and half of them doing many repetitions under lighter loads. The bone densities of the first group's hips increased while the densities of the second group's decreased. Muscle strength in both groups increased significantly. This shows that the bone density of even older women, at least in their hips, can actually be increased by weight training, but only if the weights are fairly heavy.<sup>453</sup>

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<sup>445</sup> Friedlander A L et al. *A two-year program of aerobics and weight training enhances bone mineral density of young women*. Journal of Bone and Mineral Research, 1995; 10(4), 574-585.

<sup>446</sup> Graves J & Franklin B A. *Resistance Training for Health and Rehabilitation*. Human Kinetics, 2001.

<sup>447</sup> Tracy B L et al. *Muscle quality. II. Effects of strength training in 65-to 75-yr-old men and women*. Journal of Applied Physiology, 1999; 86(1), 195-201.

<sup>448</sup> Carpenter D M & Nelson B W. *Low back pain strengthening for the prevention of low back pain*. Medicine and Science in Sports and Exercise, 1999; 31:18-24.

<sup>449</sup> Goldberg L et al. *Changes in lipid and lipoprotein levels after weight training*. Journal of the American Medical Association, 1984; 252(4), 504-506.

<sup>450</sup> Martel G F et al. *Strength training normalizes resting blood pressure in 65-to 73-year-old men and women with high normal blood pressure*. Journal of the American Geriatrics Society, 1999; 47(10), 1215-1221.

<sup>451</sup> Fleck S J & Kraemer W J. *Designing resistance training programs, 4<sup>th</sup> edition*. Human Kinetics, 2014.

<sup>452</sup> Mayhew J L & Gross P M. (1974). *Body composition changes in young women with high resistance weight training*. Research Quarterly, 1974; American Alliance for Health, Physical Education and Recreation, 45(4), 433-440.

<sup>453</sup> Kerr D et al. *Exercise effects on bone mass in postmenopausal women are site-specific and load-dependent*. Journal of Bone and Mineral Research, February 1996; 11(2):218-25.

Strength training can also increase self-confidence. 16 weeks of weight training by a group of female undergraduate students increased not only their strength and cardiovascular fitness, but also their self-confidence and self-esteem.<sup>454</sup> Furthermore, because weightlifting produces relatively fast results, boys and girls who take it up will quickly discover that they are stronger than many of their classmates in the school gym and playground, and they too will gain in self-confidence and self-esteem as a result.

Let me finish with these words from a paper that is probably the most complete scientific review of this subject.<sup>455</sup> *‘Research demonstrates that resistance exercise training has profound (beneficial) effects on the musculo-skeletal system, contributes to the maintenance of functional abilities, and prevents osteoporosis, sarcopenia (the loss of skeletal muscle mass and strength as a result of ageing), lower back pain, and other disabilities. More recent seminal research demonstrates that resistance training may positively affect risk factors such as insulin resistance, resting metabolic rate, glucose metabolism, blood pressure, body fat, and gastro-intestinal transit time, which are associated with diabetes, heart disease, and cancer. Research also indicates that virtually all the benefits of resistance training are likely to be obtained in two 15- to 20-minute training sessions a week.’*

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<sup>454</sup> Trujillo C M. (1983). *The effect of weight training and running exercise intervention programs on the self-esteem of college women.* International Journal of Sport Psychology.

<sup>455</sup> Winett R A & Carpinelli R N. *Potential Health-Related Benefits of Resistance Training.* Preventive Medicine, 2001; 33, 503–513.