

## The Effect of Exercise on Mineral Bone Density on Postmenopausal Women

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**Received:** June 30, 2021; **Published:** July 27, 2021

The disease of osteoporosis in recent years is evolving so rapidly, which is estimated that by 2020 in the United States will affect about 61 million people. It is an asymptomatic disease and therefore its early diagnosis is not attainable. It has been statistically recorded that 10% of patients suffering from an osteoporotic fracture, decrease. Exercise is an effective, non-drug intervention to protect bone density and most importantly, improves balance and fitness in postmenopausal women with osteopenia and/or osteoporosis.

Based on the international literature, two specific exercise groups seem to monopolize the interest of researchers in the effect of exercise on bone density, the aerobic and the anaerobic exercise. Unfortunately, there are few studies that directly compare the above two types, as almost all studies focus on either only one type or a combination of them [1].

Most of the comparative studies, which have been done, indicate that resistance training (anaerobic exercise) has better results in increasing or maintaining bone mass than aerobic exercise. Specifically, in a fairly large study of 3,310 women with an average age of 69, Turner, *et al.* (2002) found that women who were primarily engaged in gardening and weight training had significantly higher bone density than those who did dance, walking or engage with other forms of aerobic exercise [2]. Also, the research of Kerr, *et al.* (2001), reported similar results, with an increased bone density by 1% in the resistance exercise group compared to the aerobic exercise group, which a decrease in bone density was observed [3].

The general results of studies on bone changes, based on exercise, are contradictory [4,5]. The intensity of exercise seems to play a crucial role in changing the bone mass. Medium and/or high intensity programs show greater benefits in increasing hip bone mass. In general, however, based on better physical condition, the risks of falls and fractures are significantly decreased [6-8].

The frequency of falls, in the elderly people, is associated with lower limb weakness, instability and inability to walk, so based on these facts, exercise takes a serious place in osteoporosis programs. The osteogenic response is fully activated during prolonged loads and increased physical activity. Thus, improving functional exercise would directly increase the mechanical loads exerted on the bone daily by physical activity and the normal muscle contractions. These, in turn, positively affect the size and internal structure of the bone [9].

The 30% of the general population over the age of 55 fall each year, with postmenopausal women experiencing the highest rates of falls-related fractures and those directly related to balance and muscle weakness disorders associated with osteopenia and osteoporosis [10]. Most of the studies, referring to exercise, conclude that participants show reduced rates of fall and falls risk. Exercise significantly improves the strength of the limbs, torso and cardiorespiratory function, which are protective factors against falls and connected with fractures. In addition, it is worth noting the beneficial effect of regular exercise on balance, neuromuscular coordination, muscle strength, reaction time to stimuli, as well as reflex movements of the protective reaction during the fall, as falls are a common cause of osteoporotic fractures.

In other words, exercising is salutary and has a tendency to reduce the risk of falls while having a beneficial effect on bone mass and improving bone strength [11].

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**Volume 12 Issue 8 August 2021**

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