

The Prevention of Osteoporosis Using Physical Activity in Those Sixty and Over



Kaitlyn Boellner, Mikayla Wiemels, Nathan Harmych, Brandon Matheis
Advisor: Dr. Manuella Crawley

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INTRODUCTION

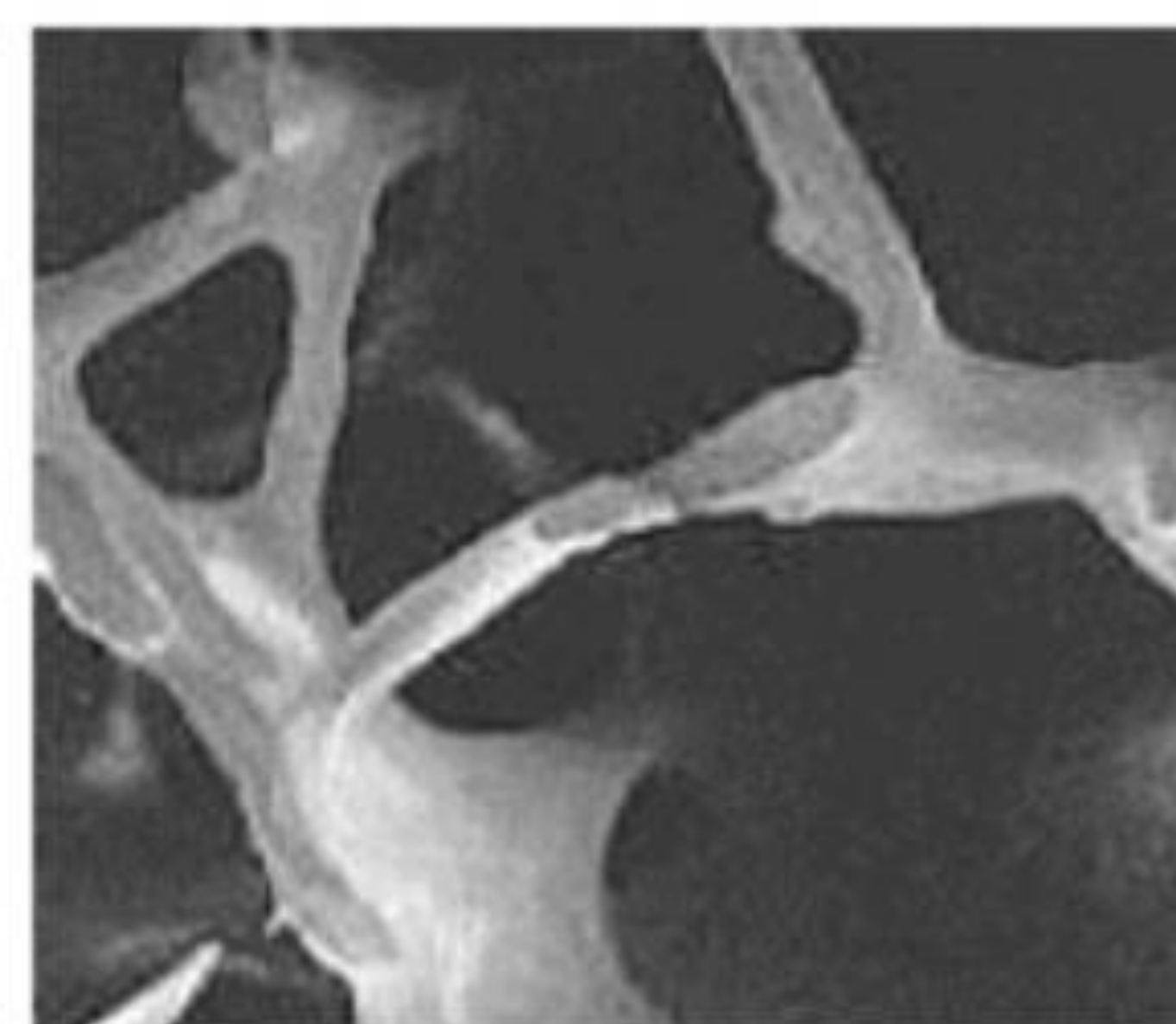
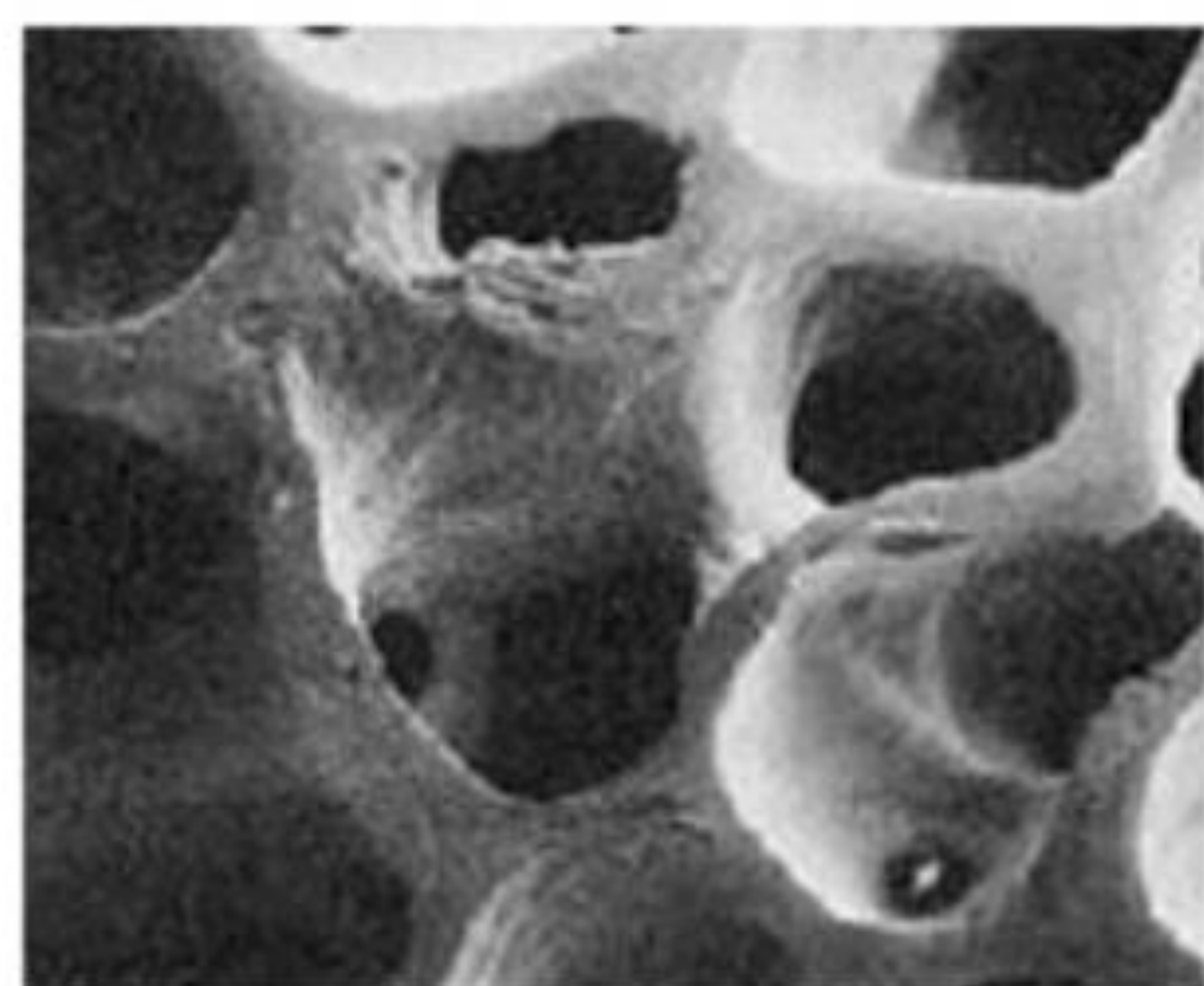
Osteoporosis is a major public health problem and is characterized by micro-architectural deterioration of bone tissue and low bone mineral density (BMD) which leads to reduced bone strength, increased bone fragility and a consequent increase in risk of skeletal fractures (Pinheiro et al, 2020). One in three women and one in five men over fifty experience osteoporotic fractures (Sozen et al, 2017). This project will explore if physical exercise can help prevent osteoporosis to any extent, with hopes of also uncovering whether it will decrease fracture frequency and/or increase the health of the elderly population overall.

OBJECTIVES

This poster intends to further research osteoporosis and the use of physical activity in its prevention. It will show more about how exercise can help people, especially the elderly, with osteoporosis.

METHODS

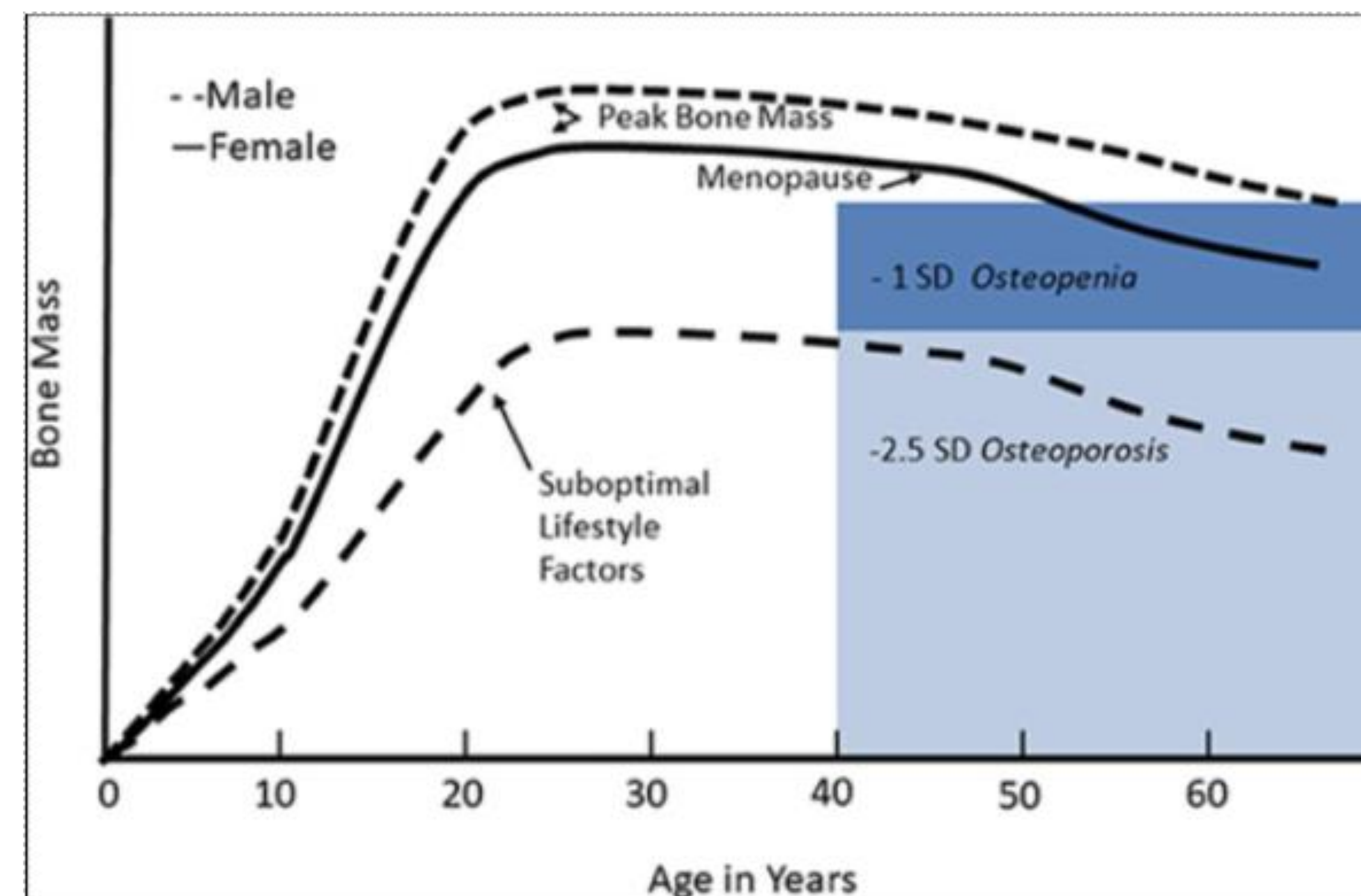
- This project is a literature review using Google Scholar and the Cleveland State Michael Schwartz Library database.
- Key search terms included “preventing osteoporosis with exercise,” “preventing osteoporosis in the elderly,” and similar terms.



Normal Bone

Osteoporotic Bone

Microscopic view of normal bone versus osteoporotic bone (Biomedical and Pharmacology Journal).



After about the age of 40, in both men and women there is a decrease in bone mass causing a higher risk of developing osteoporosis. Maximizing bone mass early in life is the best way to prevent osteoporosis in the future (Rutherford).

RESULTS

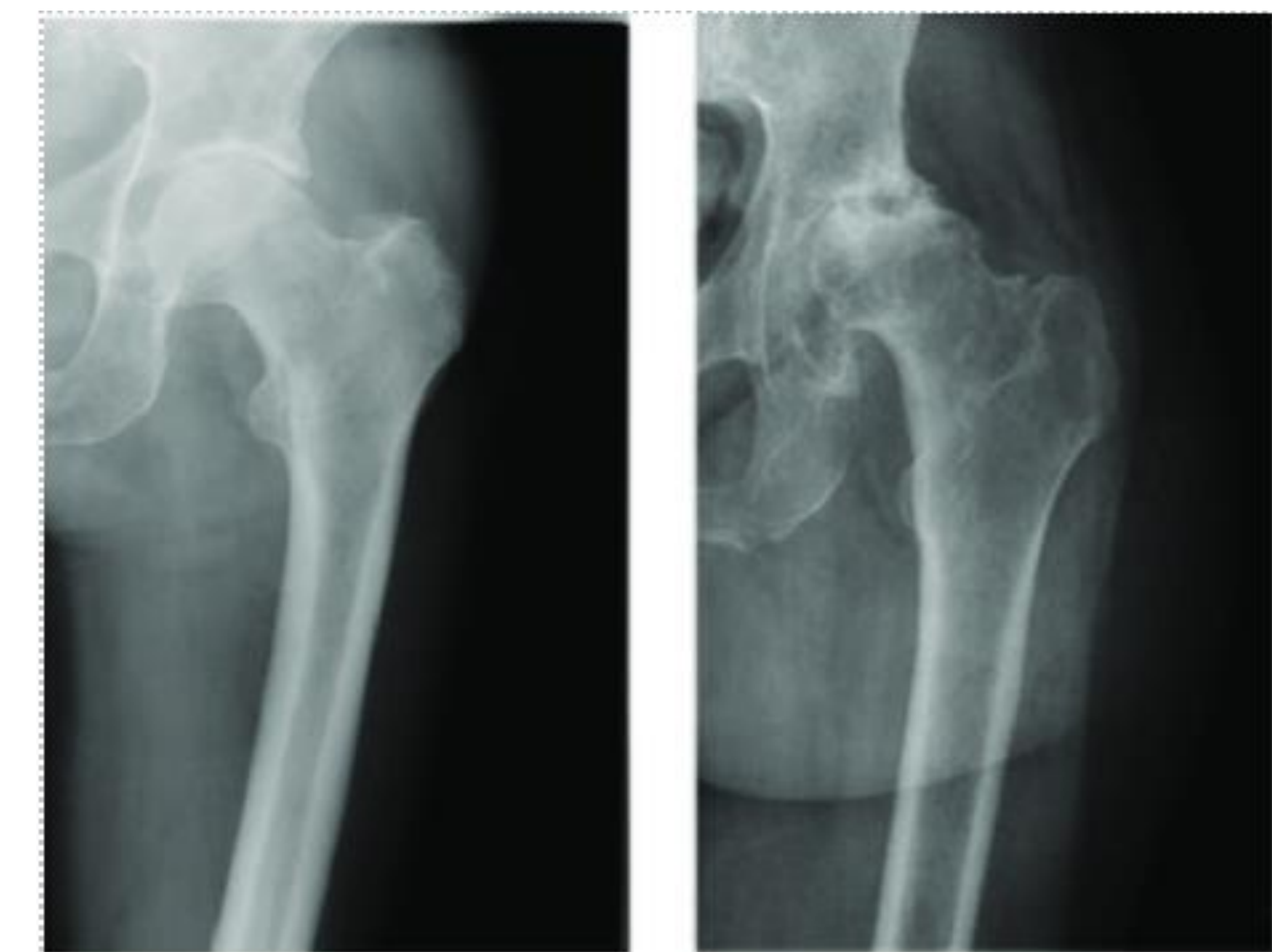
- While exercise programs (specifically resistance training and programs with multiple types of exercise) have proven to increase bone mass density, the amount of BMD increase was relatively small and is not definitively enough to prevent osteoporosis (Pinheiro et al, 2020).
 - Adequate exercise in adult years is effective in conserving bone as opposed to increasing it.
 - By regularly exercising, elderly individuals can slow the rate of bone loss along with increasing their overall fitness and muscle strength.
- As for types of exercises, literature has suggested that low-intensity exercises such as walking have minimal impacts on bone mass density in adults. Instead, weight-bearing exercises were claimed to further maintain bone mass along with other practices such as regularly intaking calcium (>1000mg/day).
- In a random controlled trial of exercise and its effect on osteoporosis, there was an increase in young men’s bone strength but not in young women’s bone strength.

Acknowledgments

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CONCLUSIONS

There is no certainty that exercise prevents osteoporosis in elderly populations, but the overall benefits of exercise can greatly help all people maintain strength and balance, as well as conserve bone mass density. If these falls can be prevented, then osteoporotic fractures can also be. Exercise helps to increase general bone health for children and adolescents. This poster concludes that it will also help older people, even if it is unsure that it prevents osteoporosis.



Normal bone

Osteoporotic bone

X-ray view of normal versus osteoporotic bone (Research Gate).

FUTURE WORK

Future study should take into account confounding variables, such as calcium intake, so that there will be more certainty about the impact of physical activity on preventing osteoporosis. There should also be more long-term studies in which elderly take part in exercise programs for years rather than months.

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