

# **Women's Lifespan: The Need for Exercise**

**By Madison Virostko and Graduate Student Mentor, Anna M. Welch**

## **Introduction**

Human beings are arguably the most complex organisms on this planet, with each bodily system working together in an organized manner for the benefit of the total being. To add to this complexity, there are physiological sex-differences such as the reproductive organs that specifically impact women's health throughout the lifespan. Further, sex differences between women and men are often overlooked and underappreciated when studying health and exercise. Not only do women have different levels of hormones in their bodies, but they also hold crucial organs that can do amazing things like carry and grow a child inside of them. For this reason, women need to be educated on their health and learn how exercise can improve it in order to sustain a body that is cardiovascular, muscularly, and mentally strong. The purpose of this article is to inform the readers of how cardio and muscular strength exercise can improve the health and well-being of women. Women's health has a wide range of specialties that deserve the attention and education needed in order for females to maintain a healthy lifestyle and understand how their body works.

## **Exercise and Bone Health:**

### **Bone Health: Childhood/ Early Age**

Exercise benefits women of all ages by improving cardiorespiratory fitness, muscular strength, and mental health. However, exercise also plays an important role in the improvement and maintenance of bone health, especially when starting from an early age. Research has shown that when starting resistance exercise training from an early age (between 10 and 12 years old) bone growth and bone mass will both develop more quickly and efficiently compared to young children who do not participate in any resistance training (1). This will lead to stronger bones and decrease the likelihood of developing osteoporosis as an adult (1)

### **Pre-menopause and Late Adulthood**

Women over the age of 50 have 6.8% risk of developing a fragility fracture due to low osteoporotic bone mass (1). There is a shortage of women reaching optimal peak bone mass during adulthood which leads to them developing osteoporosis or having an increasing likelihood of fracturing or breaking bones (1). Studies have shown that by increasing bone mass by 10% in women will lower their risk of developing osteoporosis for an additional 13 years (1). In order to

increase this bone mass, physical activity must be a part of women's every-day lifestyle (1). This type of physical activity includes high-impact exercise such as jumping or hopping, or resistance training with weights (1). In order to improve and maintain bone health, two to four exercise sessions (30-minutes a day or less) a week over the course of their lives is required (1). The type of exercise that should be included to see improvement includes resistance training or high-impact exercise (1).

### **Post-menopause and Osteoporosis**

Improvements in muscle and bone health were seen in post-menopausal individuals who included Vitamin D supplementation and exercise training into their daily routine. "Menopause is an age-dependent physiological condition associated with a natural decline in estrogen levels, which causes a progressive decrease of muscle mass and strength and bone density" (2). When this occurs, osteoporosis and sarcopenia are likely to form in elderly women due to a decrease in vitamin D, estrogen, Type I and Type II fibers, protein synthesis, and calcium release (2). Sarcopenia is the loss of muscular function which can result in movement restriction, functional impairment or disability, and a reduction in the quality of life. (2). Osteoporosis is a disease that occurs when the body loses too much bone mass resulting in weak and brittle bones. The interaction between muscle and bone from these two diseases results in negative resonance between the two tissues that reduces the quality of life in postmenopausal women (2.). Women who experience these diseases are encouraged to supplement vitamin D and calcium into their diet and combine this with specifically – designed training protocols. Vitamin D is helpful for the regulation of calcium and phosphorus, and skeletal mineralization through endocrine effects on bone, intestine, parathyroid glands, and kidney (2). Supplementing Vitamin D into one's diet can significantly improve both muscular and bone density allowing relief from sarcopenia and osteoporosis (2). The type of exercise encouraged is resistance exercise training. This type of exercise is effective in increasing muscle mass, strength, and endurance. When exercise occurs, muscle growth occurs resulting hypertrophy and strength which can result in relief from the sarcopenia (2). Bone mass is also improved due to exercise preventing or slowing down the reverse loss of bone mass that comes from osteoporosis (2). Postmenopausal women should consider these options in order to improve health and quality of life for the future.

### **Aging**

Elderly women should participate in weight bearing exercises, yoga, or walking in order to maintain bone health. When individuals put their body under some form of stress, the body adapts and gets stronger. This comes from the idea of Wolf's Law and relates to people of all ages, including the elderly. These types of activities also further prevent fall risks that develops with age (1). Therefore, not only can resistance trained exercise improve muscular strength and cardiovascular health, but also play a key role in improving the quality of life for women in the future.

## **Menstruation and Hormones:**

### **Fluctuations in Hormones**

There is also discussion on how the menstrual cycle in women can affect exercise performance. The menstrual cycle includes menstruation, the follicular phase, ovulation, and the luteal phase (3). Menstruation also comes with a number of symptoms including cramps, bloating, muscle aches, mood swings, nausea, and many more (3). It has been known that certain sex hormones, like estrogen, in women fluctuate across the menstrual cycle which could have implications for exercise performance (4). Research suggests that exercise performance may be trivially reduced during the follicular phase of the menstrual cycle compared to other phases (4). The follicular phase starts on the first day of menstruation and ends with ovulation. This reduction in exercise performance could be due to the fluctuation of hormone levels and the decrease energy levels (4). It is recommended that personalized approaches should be taken based on each individual's response to exercise and energy levels (4).

## **Exercise and Pregnancy**

### **Is it Recommended to Exercise while Pregnant?**

Physical activity and exercise during pregnancy is highly encouraged and beneficial for women's physical and mental health. Many obstetrician- gynecologists encourage their patients to continue or to begin exercise as a crucial component for their optimal health (5). Research has shown that women who regularly engage in aerobic activity before their pregnancy can continue their routine during and after pregnancy (5).

### **What are the Benefits?**

Many benefits, both physical and mental, can be seen from women who continue to exercise regularly while pregnant. These benefits include decreased gestational diabetes mellitus, cesarean birth, and operative vaginal delivery (5). It has also shown evidence in decreasing

postpartum recovery time and prevent depressive disorders (5). There are minimal risks for exercising while pregnant, however, some modifications to the exercise routines may be needed due to the anatomical and physiological changes to the woman's body (5). There is no gold standard for which type of exercise is the most beneficial during pregnancy due to every woman having different levels of comfortability (6)

### **Conclusion:**

In conclusion, human beings are complex creatures that have physiological sex-differences that can alter how one should take care of and treat their body. The female body has many complex aspects to it that can affect health through multiple stages of life such as childhood, pregnancy, menopause, and old age. Bone health is crucial to build throughout childhood to prevent the onset of osteoporosis after menopause. Women also deal with change in hormones during their menstrual cycle, pregnancy, or menopause. Regular exercise is recommended to maintain health or improve mental health during these changes including resistance training and high-impact exercise. It is important to inform women the benefits of cardio and muscular strength exercise throughout their life.

### **4 Elements:**

#### **1. Apply It**

- a. This article provides information on how women's bodies are different to male bodies in terms of hormone fluctuations, bone health, biological sex differences, and exercise prescriptions.
- b. The exercise professional will gain information related to hormonal changes throughout a women's stages of life and how these changes can affect the health and well-being of women.
- c. It also explains how exercise can aid in the prevention or treatment for certain diseases

#### **2. Bridging the Gap**

- a. This article summarizes the effects of hormones during the different stages of life for women. It touches on the impact of exercise and how it can help prevent certain diseases that are both physical and mental. The female body has many differences compared to the male body and requires special attention on how to maintain a healthy lifestyle.

### 3. Summary Statement

- a. The female body has unique characteristics that requires special attention compared to the male body. This article will provide information on how certain hormonal changes can impact the health of women, and how exercise can aid in the the prevention or maintenance of certain diseases.

### 4. Pulled Text

“Not only do women have different levels of hormones in their bodies, but they also hold crucial organs that can do amazing things like carry and grow a child inside of them. For this reason, women need to be educated on their health and learn how exercise can improve it in order to sustain a body that is cardiovascular, muscularly, and mentally strong.”

### Bio:

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