



WOMEN'S HEALTH

The Female Athlete: The “X” Factor Increases With Age

Erin Stubblefield, DC

WHAT YOU NEED TO KNOW

- While many of the concepts of caring for our athletes can be transposed between men and women, all female athletes need support regardless of age.
- Some of the most common injuries in women’s sports include shin splints, ACL strains / tears, and other overuse injuries to the back and lower extremities.
- A supportive foundation is essential for an athlete’s body to manage the weight and pressure exerted through their feet.

The Games of the XXXIII Olympiad are poised to take place this year, marking the 33rd celebration of human physical prowess, agility and skill. Over 10,500 athletes worldwide are expected to participate in Paris, France, this summer.¹ The 2024 Summer Olympics will make history. For the first time, there will be an equal number of male and female athletes.² This is a significant milestone since the first Games occurred in Athens, Greece, in 1896.

Considering women were not allowed to compete until the second Games, 5,250 female Olympians is an astounding number. Those Games, with 22 female athletes, were played in 1900.² Over the years, the number of women participating in the Olympics has significantly increased. The Tokyo Games in 2020, which actually took place in 2021 due to the COVID-19 pandemic, saw an unprecedented 5,457 female athletes in action.³

This number is a testament to women’s achievements in Olympic sports. Even as we commemorate the record-breaking participation in 2020, this year’s Olympics mark the realization of gender equality after 128 long years.

Understanding the “X” Factor

Over time, it has become clear that female athletes are unique in their own way. While some might see size and strength as potential drawbacks, possessing the “X” factor – the presence of two X chromosomes – may enhance athletic performance by introducing additional dimensions of adaptability and longevity.

Revisiting our high-school biology, we recall that humans typically develop as either female or male. This final determination hinges on the mix of sex chromosomes inherited from the germ cells of their parents. The sex chromosomes, called “X” and “Y” due to their structure, are closely bound DNA and protein molecules that reside in the sex organs of the parents, the ovaries, and the testes.

Inside the sex organs, the process of meiosis determines the sex chromosome that the parent’s germ cells will pass on to their offspring. During meiosis, each germ cell divides twice, resulting in four cells. The germ cells will eventually fuse during fertilization, and the resulting embryo will have full genetic material, including two sex chromosomes, receiving one from each parent.⁴

Females tend only to have “X” chromosomes, so the egg usually only carries this chromosome. Male sperm cells carry both “X” and “Y” chromosomes. This means that the male parent and the sperm they provide will determine whether the offspring is female (XX) or male (XY).⁴

Female Resilience and Longevity

Throughout history, women have demonstrated an exceptional ability to adapt and survive, which science struggles to explain. Statistical data shows that males are 10% more likely to die during infancy than females, even when given the same level of care.⁵

Women are also less likely to experience early symptoms and effects of major diseases like cardiovascular disease and high blood pressure compared to their male counterparts.⁶ Additionally, women may experience slower progression of these diseases and, in some cases, present with milder symptoms.⁶

In the United States, women have lower mortality rates than men for all but three of the top 15 common causes of death, including both heart disease and cancer.⁷ As everyone pursues the Fountain of Youth, women are statistically expected to live almost six years longer than men. Interestingly, this difference was just a two-year gap in 1900.⁷

This resilience and longevity may explain why female athletes compete at higher levels for more extended periods as they age. Research published in 2020 suggests that women outperform men in longer-distance events such as swimming and cycling.⁸ Women also tend to perform better in colder temperatures, demonstrating a greater tolerance in less-than-ideal conditions.⁹

It is worth noting, however, that research surrounding female athletes and athletic performance is lacking, and existing studies on athletic performance tend to focus predominantly on male athletes.¹⁰ This presents a challenge for women’s sports and practitioners who engage with female athletes, making it essential to seek a more comprehensive understanding of their performance-related characteristics.

The Importance of Support in Female Athletic Performance

While many of the concepts of caring for our athletes can be transposed between men and women, all female athletes need support regardless of age. Some of the most common injuries in women's sports include shin splints, ACL strains / tears, and other overuse injuries to the back and lower extremities.¹¹

A supportive foundation is essential for an athlete's body to manage the weight and pressure exerted through their feet. Without proper support, significant forces can be transmitted through the feet and up the kinetic chain, potentially leading to injury or compromised performance. Even when the body is at rest, the feet receive proprioceptive input from surfaces like the ground, track or court.

Understanding the crucial role of feet in receiving proprioceptive input and stabilizing the kinetic chain highlights the importance of appropriate foot support. In line with this, it's worth noting that custom flexible orthotics have been demonstrated to increase weight-bearing function by over 30%.¹² This suggests the significant potential of these orthotics in enhancing overall performance and preventing recurrent lower extremity injuries.

Throughout history, it has been common for events to repeat themselves. The Olympic Games of 1900 were held in Paris, and only 22 women participated. Fast forward to the upcoming 2024 Games in Paris, and we will have 5,250 female athletes competing. This is just the beginning of what we can expect from female athletes in the future.

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