

## STRONG WOMEN | MANDY HAGSTROM

### PODCAST TRANSCRIPT

**UNSW Centre for Ideas:** Welcome to 10 Minute Genius, an eight-part series created by the UNSW Centre for Ideas, to provide pause and create a space to engage with new ideas from UNSW Sydney's thinkers, dreamers and envelope pushers, as they help to make sense of the relentless information vortex in which we live. In under 10 minutes, or roughly the same amount of time it takes to do a triple set of bench presses, exercise scientist Mandy Hagstrom will explain why being male or female doesn't make as much difference to growing muscles as you might first think.

**Mandy Hagstrom:** Historically, pumping iron to build muscles has been seen as a manly pursuit, and research into sport and exercise has largely focused on men too. But increasingly, women at gyms are heading to the heavyweights room and are picking up the dumbbells to reap the benefits of strength training. So what can women gain from this type of training? As a former New Zealand weightlifting champion, Commonwealth powerlifting medallist and an exercise scientist, this topic is super close to my heart.

Let's start with the basics like, what is strength training? Strength training is the use of exercises using some kind of external weight, like a dumbbell, or a barbell, or a machine, to improve muscle strength and size. And it can also be called resistance training. Strength training can be beneficial regardless of your sex. Although people often associate bigger muscles with conventional ideas around attractiveness, but that's not where the true value of strength training lies. Beyond increasing the size and strength of muscles, strength training also increases the strength of bones, your tendons, your ligaments, it improves the health and mobility of your joints, it reduces your risk of injury. This type of training also has flow on benefits for heart health, metabolism and the prevention of disease. The benefits of strength training go far beyond the physical. There are benefits for mental health and wellbeing too.

When I say males and females have just as much to gain from strength training, I mean it literally both male and female strength trainers gain the same relative amount of muscle mass following strength training. The key word here is relative. So that's in proportion to an individual's size. So males typically have greater muscle size and strength compared to females. But both sexes lose strength and size as we age. But these differences between sexes don't tell the entire story when you consider what can be gained relative to size, and what that can mean later in life. My research into this found that both older males and older females gain the same amount of muscle mass following strength training relative to their size, even though the absolute amount of muscle gain and whether it was upper versus lower body gains differed between the sexes.

So why didn't we know this before? My team published this piece in 2020. You'd think that surely we would be across the basics like sex differences by now. Unfortunately, not. Sadly, sex bias in sport and exercise research has been holding us back. Recently, my team looked at a group of studies across sports medicine and they demonstrated that in a subset of exercise based research, male participants outnumbered female participants by five to one. There were 19 studies using male only participant groups, 10 using a combination of both sexes, however, there were zero studies examining females only – none. Even when the studies used participants from both sexes, only two presented their data in a manner that we could actually examine the findings by sex.

So why does this matter? Well, there are numerous documented sex differences in physiology, including exercise physiology. As I mentioned before, strength training has benefits for everyone, for physical and mental health, for the prevention of disease and a reduction of healthcare and associated costs. So what if, to maximize these benefits, the way in which we prescribe exercise needs to be different for males and females? Are we disadvantaging the health of half of our population due to a lack of understanding? Unfortunately, sex bias and research isn't an isolated problem. This problem emerges across the many disciplines and research areas that make up sport science, from biomechanics through to strength and conditioning. But for me, these questions were personal, they weren't just theoretical.

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At the end of 2011, after winning the New Zealand National weightlifting championships, I retired from competitive Olympic lifting, giving up my dreams of making it to the Glasgow Commonwealth Games. It was too much juggling running a PhD clinical trial while trying to qualify for Glasgow. My career and my love of science won.

However, early in 2013, I decided to have a go at powerlifting, a different strength sport, and my choice was based on the idea that I could train on my own without a coach and a squad, no travel commitments and no external pressures to perform. I could use the evidence base, the science that I was using in my PhD design to write my own programs. However, what I found was a complete lack of female resistance training literature. Even so, I designed my own programs. And I got myself to my first Commonwealth Powerlifting Championships, within nine months of starting the sport, and I got a medal. But I always wondered if I could have done better if the literature related to me. So this experience led to me conducting the first systematic review accumulating all of the available evidence to quantify the benefits of strength training in terms of muscle strength, and muscle size for females. This piece ended up being featured by the world's largest sports brand, Nike, and it showed me that the time for addressing equity in the exercise literature is now. People cared and people want to understand the human body, not just half of the population.

The thing is, there might not actually be as many differences as some of us might think. We may have many areas in which we are similar and where exercise prescription doesn't need to differ. But without the research, we won't know. That's the driving question behind my team's research. When does exercise prescription need to be individualized by sex? Regardless of your goals and exercise, whether it's performance or the prevention of disease, we can all benefit and my hope is that my research can help us all do that.

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