The right sports bra could increase your running performance by 7%

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Running is one of the most accessible forms of exercise with an array of proven cardiovascular and musculoskeletal benefits, and an added bonus

of increased mental health. Good-quality running gear, such as the right pair of shoes, is vital to improve running performance and reduce injury risk. For women particularly, a well-designed sports bra protects from exercise-induced breast pain, which can be a significant barrier to practicing sports. Up to 72% of women experience breast pain while running.

Previous research has shown that the increased breast support sports bras offer not only influences breast movement but can also positively influence running performance. Greater breast support has been linked to lower oxygen consumption and better range of motion.

Dr. Douglas Powell and Hailey Fong and colleagues at the Breast Biomechanics Research Center at the University of Memphis wanted to further investigate the effect of a good sports bra on running biomechanics, and have now published new findings in *Frontiers in Sports and Active Living*.

"The biomechanics underlying improved running performance with greater breast support are not well understood. Our study represents one of a series of research studies on the topic of breast support and whole body biomechanics," explained Powell. "We wanted to identify strategies to reduce activity-induced breast pain for females, a group that makes up approximately 50% of the population."

Biomechanics of running

Specifically, Powell and his colleagues looked at the influence of breast support on knee joint stiffness during treadmill running. Knee joint stiffness is a biomechanical measure that indicates how resistant the knee joint is to movement when force is applied. Knee joint stiffness has been associated with lower oxygen consumption, improved running performance, and running-related injury.

A sample size of 12 recreational runners, aged between 18 and 35 years, with a self reported B-, C-, or D-cup, was professionally fitted with two different sports bras: a high support bra and a low support bra. For the control condition, the participants were asked to perform the experiment bare chested. Each participant then performed three-minute running bouts in each of the three randomized breast support conditions (high, low, bare/control).

To collect the data the researchers used a 10-camera motion capture system and instrumented treadmill. The movements of the participants were tracked using individual retroreflective markers fitted on different parts of their bodies. The researchers used Visual3D to calculate knee joint excursions, while custom software was used to calculate knee joint stiffness and breast displacements during the stance phase of running in each experimental condition.

The importance of good support

The experiment showed that increased levels of breast support were associated with greater knee joint stiffness due to smaller joint excursions. Compared to the control condition, the low and high support conditions were associated with 2% and 5% increases in knee joint stiffness respectively. Overall, taking into account these results and results from previous research by Powell and Fong, a high support sports bra can improve a female's running performance by 7%.

"The findings show that breast support not only influences movement of the breasts but that compensations occur across the entire body," said Powell. These compensations can lead to reduced running performance, increased injury risk, and even the development of chronic pain such as back and chest pain.

Powell continued, "Over the past 50 years, limited evolution in bra

design has occurred. Our findings, in conjunction with previous research studies, show that sports bras should be considered not only as apparel, but also as sports equipment that can both improve performance and reduce the risk of injury, playing a role in women's health."

More information: Increasing breast support is associated with altered knee joint stiffness and contributing knee joint biomechanics during treadmill running, *Frontiers in Sports and Active Living* (2023). DOI: 10.3389/fspor.2023.1113952. www.frontiersin.org/articles/1 … or.2023.1113952/full

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