

High-intensity interval training increases injuries, study finds

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People who engage in high-intensity interval training are at greater risk for injury, especially in the knees and shoulders, a Rutgers study found.

These workouts, which combine aerobic exercising, [weight lifting](#) and calisthenics at maximum capacity, followed by periods of recovery, have been growing in popularity over the past decade, driven by the efficiency of the exercise to deliver fitness goals in less time.

The study, which appears in the *Journal of Sports Medicine and Physical Fitness*, acknowledged that while this type of training is effective in improving cardiorespiratory fitness, boosting energy and promoting lean muscle mass and fat loss, it also increases injury risk.

"These workouts are marketed as 'one size fits all.' However, many athletes, especially amateurs, do not have the flexibility, mobility, core strength and muscles to perform these exercises," said Joseph Ippolito, a physician in the department of orthopaedics at Rutgers New Jersey Medical School.

Analyzing records in the National Electronic Injury Surveillance System from 2007 through 2016, the researchers found 3,988,902 injuries resulting from exercise equipment, such as barbells, kettle bells and boxes, or calisthenics, such as burpees, push-ups and lunges, that are common to these programs. Most injuries involved knees, ankles and shoulders. White males aged 20 to 39 were most injured.

The researchers found a steady increase of an average of 50,944 injuries per year, which rose alongside the growth in interest in the workouts as determined by the number of Google searches during the years studied. During this decade, they found a significant increase in nerve damage, internal organ injuries, concussions, puncture wounds, dislocations and strains and sprains.

Athletes who perform these workouts without supervision are at increased risk for injury from poor form and muscle overuse. "There is strong evidence that these types of injuries—specifically from repetitive overload at the knee—can lead to osteoarthritis," said Ippolito.

People who are new to these workouts should speak with their physicians first and more experienced athletes should learn how to minimize preventable injuries, the researchers recommended. Athletic trainers, [physical therapists](#) and fitness instructors should ensure athletes are conditioned, use proper form and understand the recovery phase.

"We certainly do not want to discourage people from this type of [exercise](#) because of its numerous health benefits, but recommend that they understand the pre-existing conditions and physical weaknesses that may predispose them to [injury](#)," said co-author Nicole D. Rynecki, a student at the medical school.

Since knee and ankle sprains and strains were the

most common injuries from high-intensity interval workouts, people should do neuromuscular training—especially those that focus on strength, jumping and balance—and pre-strengthening programs to improve flexibility before starting high-intensity interval exercises, Rynecki said.

"Exercises such as stretches that can increase range of motion and strengthen rotator cuff muscles are important, especially for older people and those who are predisposed to rotator cuff tears," she noted.

Other Rutgers authors include Brianna L. Siracuse and Kathleen S. Beebe.

More information: *Journal of Sports Medicine and Physical Fitness*, DOI: [10.23736/S0022-4707.19.09407-6](https://doi.org/10.23736/S0022-4707.19.09407-6) , <https://www.minervamedica.it/en/journals/sports-med-physical-fitness/article.php?cod=R40Y9999N00A19021210>

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