RSNA Press Release

Study Finds Gender Gap in Knee Injuries

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At A Glance

- A large MRI-based study compared knee injuries between men and women and revealed differences in injury patterns.
- Men had more ACL tears, while older women were more prone to meniscal and MCL tears.
- The findings suggest that men suffer more injuries from trauma, while older women are more prone to injury from joint degeneration over time.

CHICAGO – One of the largest MRI-based studies comparing knee injuries between men and women reveals surprising differences in injury patterns based on gender and age. The findings, which can be used to improve risk assessment and develop early intervention strategies, will be presented today at the annual meeting of the Radiological Society of North America (RSNA).



Jenifer Pitman, M.D.

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Ali Ghasemi, M.D.

“In recent years, we've grown more interested in the differences in knee injuries between men and women,” said study co-author Jenifer Pitman, M.D., assistant professor of radiology at Johns Hopkins Medical Institute in Baltimore, Maryland. “The majority of past research has focused on men, but as we expand our focus to include women, the more we see that they have different risk profiles and are prone to different injuries.”

The study included 13,549 consecutive routine knee MRI exams performed between 2019 and 2024 at four outpatient radiology facilities affiliated with Johns Hopkins Hospital. The patients reported knee pain as their chief complaint. The researchers extracted the following features from radiology reports: tears in or injuries to the medial and lateral menisci, anterior cruciate ligament (ACL), posterior cruciate ligament, medial collateral ligament (MCL), lateral collateral ligament complex, and extensor mechanism or patellofemoral dislocation.

The ACL is a major ligament in the knee that connects the thigh bone to the shin and provides stability, especially during twisting, jumping, sudden stops or changes in direction. ACL injuries are common in sports and can cause pain, swelling and instability in the knee. The menisci are C-shaped pieces of cartilage on the inner (medial) and outer (lateral) side of the knee that act like shock absorbers, cushioning the joint and providing stability. Tears in the menisci can happen with twisting injuries or gradual wear and tear over time.

Analysis of the MRI reports revealed that specific injuries were observed more often in men compared to women, including ACL tears alone, ACL tear with medial meniscal tear or ACL tear with lateral meniscal tear.

“We saw more ACL tears in men especially in the 20- to 40-year-old age group, which is contrary to what’s been reported in the literature,” said first author Ali Ghasemi, M.D., postdoctoral research fellow at Johns Hopkins. “Prior studies focused on sports-related injuries have shown that young women athletes have increased rates of and a greater risk for ACL tears. However, our results show a significantly higher prevalence of ACL injuries in male patients across all age groups.”

Dr. Pitman theorized the discrepancy between their research and previous studies may be due to broadening their focus beyond sports-related knee injuries. The Johns Hopkins researchers studied all patients with knee pain, regardless of age or cause of injury.

Men had a greater number of injuries overall.

The researchers also found that meniscal and MCL tears occurred more frequently in men under 40 and among

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older women.

“In younger patients, meniscal and MCL tears were more commonly seen in men, while in older patients, women had more of these types of tears than men, which was unexpected,” Dr. Ghasemi said.

The findings suggest that older women are more prone to injuries that lead to joint degeneration over time.

“Both men and women should take precautions to avoid high-impact injuries, especially during sports or physical activity and women, especially over 40, should pay attention to joint health and consider incorporating dedicated strength training to help protect their knees as they age,” Dr. Pitman said.

Recognizing the injury patterns may help radiologists and clinicians tailor imaging protocols, risk assessments and early intervention strategies to optimize patient outcomes.

“The pre-established notion that ACL tears are more common in younger women may not be the case 100% of the time,” Dr. Pitman said. “Radiologists can also expect to see more frequent meniscal pathology and arthritis in older women.”

The researchers are continuing their investigation into knee injury patterns by gender, analyzing demographic information and patient history to better understand trends in injury patterns.

Dr. Pitman said that athletes should consider working with a health professional to build balanced strength around the knee. She advises individuals—especially older patients—with knee pain to see their physician.

“If you’re having knee pain, don’t just brush it off or attribute it to old age,” she said. “We’ve seen higher rates of meniscal tears, in particular, in women 40 years and older.”

Other co-authors are Shivani Ahlawat, M.D., and Laura M. Fayad, M.D.

Note: Copies of RSNA 2025 news releases and electronic images will be available online at *RSNA.org/press25*.

RSNA is an association of radiologists, radiation oncologists, medical physicists and related scientists promoting excellence in patient care and health care delivery through education, research and technologic innovation. The Society is based in Oak Brook, Illinois. (*RSNA.org*)

Editor’s note: The data in these releases may differ from those in the published abstract and those presented at the meeting, as researchers continue to update their data right up until the meeting. To ensure you are using the most up-to-date information, please call the RSNA Newsroom at 1-312-791-6610.

For patient-friendly information on knee MRI, visit *RadiologyInfo.org*.

Video (MP4):



Video. Ali Ghasemi, M.D., discusses his research on knee injuries in men and women that reveals surprising differences in injury patterns based on gender and age.
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Images (JPG, TIF):

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Infographic

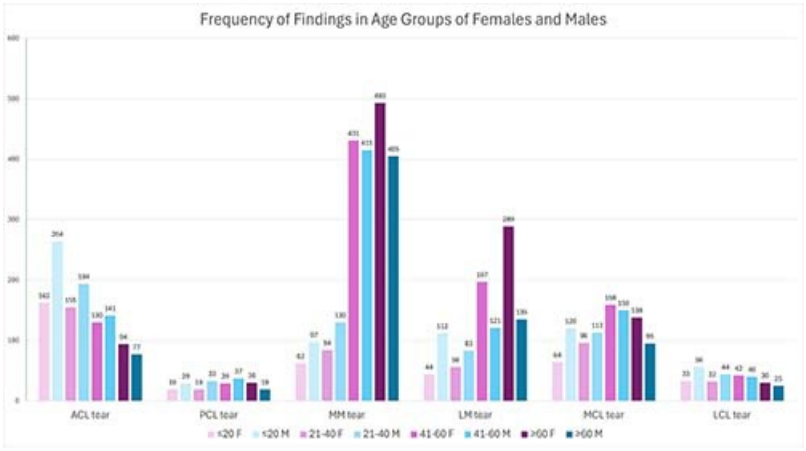


Figure 1. Absolute frequency of findings in age groups of women and men. ACL and PCL: Anterior and Posterior Cruciate Ligament; MCL and LCL: Medial and Lateral Collateral Ligament; MM and LM: Medial and Lateral Meniscus. F: Females. M: Males.

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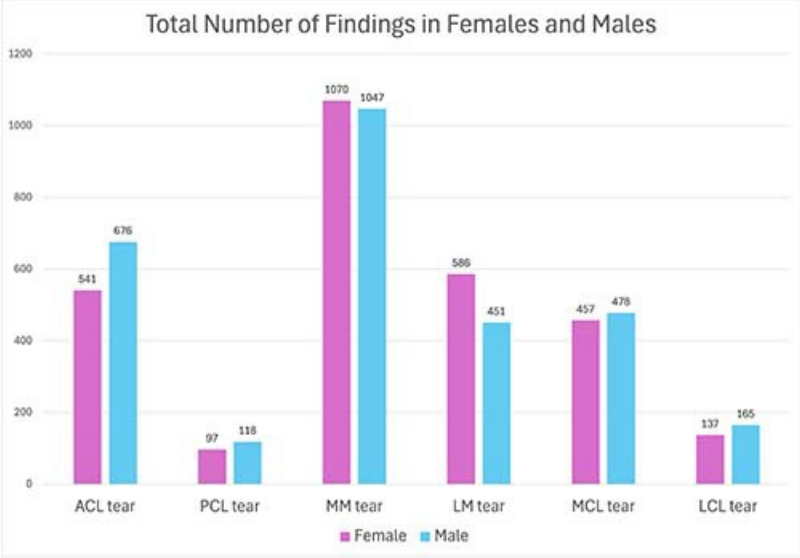


Figure 2. Total number of findings in women and men. ACL and PCL: Anterior and Posterior Cruciate Ligament; MCL and LCL: Medial and Lateral Collateral Ligament; MM and LM: Medial and Lateral Meniscus. F: Females. M: Males.



Figure 3. Arrows show a complete anterior cruciate ligament rupture in an 18-year-old male who had a knee injury while playing football.

Resources:

Abstract

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