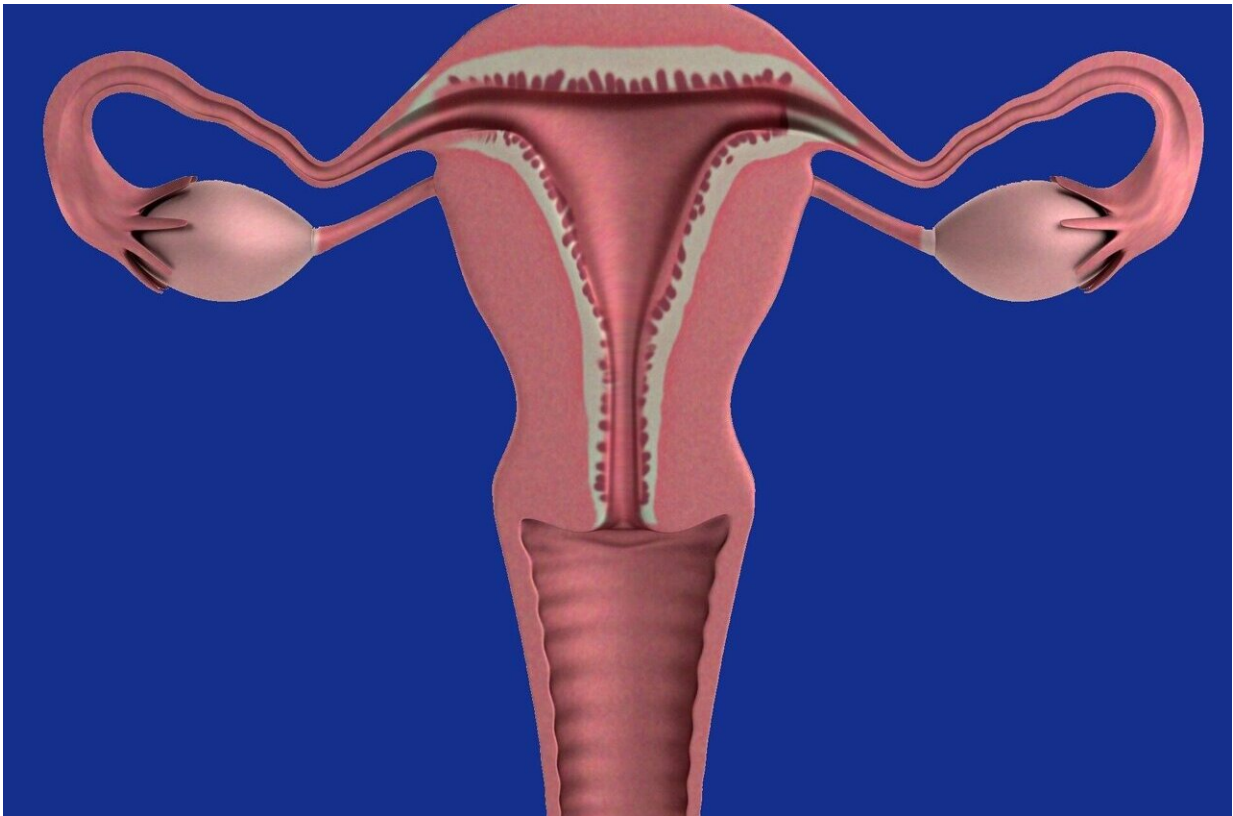


# Study shows endometriosis is linked to higher risk of depression, anxiety, eating disorders

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Endometriosis is not just a condition that affects the pelvis, but a systemic disease that involves the entire body. Now, the largest epidemiological study to date on the psychiatric factors that can

accompany endometriosis has demonstrated that depression, anxiety, and eating disorders are not only a result of the chronic pain endometriosis generates, but also have their own underlying genetic mechanisms. The team published its findings in *JAMA Network Open*.

"It's not surprising that having a [genetic predisposition](#) to [endometriosis](#) might include genetic alterations that affect other areas of the body as well," says Hugh Taylor, MD, chair and Anita O'Keeffe Young Professor of Obstetrics, Gynecology & Reproductive Sciences at Yale School of Medicine and a co-author on the study.

"The relationship between endometriosis and mental health is more complicated than we expected," says Renato Polimanti, Ph.D., associate professor of psychiatry and the study's principal investigator. "The [biological basis](#) is not just [chronic pain](#), and there is much more that we need to understand."

Endometriosis is an extremely painful condition in which tissue similar to the lining of the uterus (endometrium) grows outside the uterus. The disease manifests in a wide array of symptoms including pelvic, abdominal, and low back pain, heavy bleeding, painful sexual intercourse, painful urination and bowel movements, constipation or diarrhea, bloating, nausea, fatigue, and infertility.

Some women may experience flare ups while menstruating, while others live with daily symptoms. One in 10 women of reproductive age around the world suffers with the disorder, but widespread misconceptions—even within the medical community—can make obtaining treatment difficult.

"For a long time, researchers thought it was just a gynecological disease—that it didn't affect anything but female reproduction, and so women were often only treated when they presented with infertility,"

says Dora Koller, Ph.D., a postdoctoral researcher in computational genomics and first author. "But we have to acknowledge that the effects of endometriosis extend far beyond reproduction."

## **Physicians need to be educated**

Epidemiological studies have long revealed a correlation between endometriosis and [mental health](#) disorders, but researchers' past explanation of this relationship was "often irresponsible" and shifted the blame onto the patients, Taylor says. "Correlation does not prove cause and effect," he explains. "The inappropriate, wrong, and hurtful interpretation was often, 'these are anxious people complaining about pain that all women have.' They were wrong." When Taylor treats patients, he says, he makes sure not to view endometriosis in isolation while discounting its other manifestations.

Taylor's research over the past decade has focused on the systemic manifestations of endometriosis in various organ systems, including the brain. Through animal models, his work has established that mood disorders in endometriosis are a component of the disease's underlying pathophysiology. "We clearly show that the disease causes changes in the brain that lead to anxiety and depression," says Taylor.

## **Endometriosis extends through the body**

In this new study, the Yale research team obtained data from the UK Biobank which included more than 8,200 patients with endometriosis and 194,000 healthy controls.

First, they investigated if depression, anxiety, and eating disorders were more prevalent in those with endometriosis, accounting for chronic pain, socioeconomic status, age, body mass index, various medications, and co-

morbid conditions. They found that having endometriosis significantly increases the odds of having these three psychiatric conditions.

Next, the team wanted to explore the underlying genetics of this association. Through running a genetic correlation analysis, they found a significantly high genetic correlation between endometriosis and each of the three disorders. They further conducted a pleiotropy analysis to identify the shared genetic variants. This analysis uncovered a variant, called DGKB rs12666606, shared between endometriosis and depression. "This is a gene that is highly expressed in many brain regions as well as female reproductive tissue, which is very interesting," says Koller.

The team hopes its current study will help raise awareness about the lesser known, far-reaching manifestations of endometriosis. "It's important for the public and health care providers to know there's a common risk for endometriosis and [mood disorders](#)," says Taylor. "Going back to the history of endometriosis, it has far too often been blamed on the patient—you're too thin, you're too anxious, you complain too much. It is not that. You are at increased risk for all of these conditions simultaneously based on your genetic makeup."

Koller and Polimanti are also working to understand the relationship between trauma and endometriosis. In addition, Koller has recently launched a startup with a mission to find a non-invasive diagnostic tool for the disease. Because it takes women in the United States an average of 10 years to receive an endometriosis diagnosis, developing non-invasive, less expensive, and faster methods is critical for reducing years of unnecessary suffering.

**More information:** Dora Koller et al, Epidemiologic and Genetic Associations of Endometriosis With Depression, Anxiety, and Eating Disorders, *JAMA Network Open* (2023). [DOI](#):

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