

Study Shows Role of Gut Health in Modulating Mental Health and Eating Disorders

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STORY AT-A-GLANCE

- › Anorexia nervosa is a possibly lethal eating disorder characterized by extreme food reduction and distorted body image. It's strongly linked to depression and has the highest mortality rate among mental illnesses
- › A 2024 study found connections between gut microbiota, major depressive disorder (MDD) and anorexia. Analysis found that certain gut bacteria strains were positively and negatively correlated with depression scores and inflammatory markers
- › Short-chain fatty acids (SCFAs) produced by probiotics play a crucial role in modulating immune response and inflammation. Decreased SCFA-producing bacteria may contribute to depression and eating disorders
- › Restoring gut health through probiotics and dietary changes may help alleviate symptoms of depression and anorexia by positively influencing the gut-brain axis
- › Other strategies to improve your gut health include avoiding processed foods, and minimizing exposure to antibiotics, agricultural chemicals and linoleic acid

Anorexia nervosa, commonly shortened to anorexia, is an eating disorder characterized by an extreme reduction in food intake, which results in an unhealthy, low body weight. Moreover, people who suffer from this condition have a distorted view of their own bodies, believing that they're overweight even when others can see they're malnourished.¹

According to the nonprofit group ANAD (National Association of Anorexia Nervosa and Associated Disorders),² "anorexia has the highest case mortality rate and second-highest crude mortality rate of any mental illness." Moreover, a study published in Cureus³ noted that most people suffering from eating disorders have depression.

Interestingly, according to a recent study published in BMC Psychiatry,⁴ the answer to both depression and anorexia may lie in your gut microbiome.

Study Finds Link Between the Gut, Depression and Anorexia

In a 2024 study⁵ published in BMC Psychiatry, researchers explored the interplay between the gut microbiota, major depressive disorder (MDD) and anorexia. They selected 46 patients diagnosed with MDD, and 46 healthy participants to establish a baseline comparison. The MDD group was split into two subsets – 26 had anorexia, while the remaining 20 did not.

All participants were assessed using various methods, such as the Hamilton Depression Rating Scale (HAM-D). Fecal samples were also collected, and a gene sequencing method was used to detect the gut microbiota in the samples. Blood was also taken to measure common inflammatory markers, such as C-reactive protein (CRP) and interleukin 6.⁶

Results showed that the entire MDD population had higher depression scores compared to the control group. Higher inflammatory markers were also observed compared to healthy controls, but there were no significant differences in the inflammatory markers between the anorexic and non-anorexic subsets.⁷

Here's where the study gets interesting – an overall analysis showed that the fecal samples between the healthy control group were different from the MDD group. As noted by the researchers:⁸

"We analyzed the correlation between the representative microbiota and inflammatory factors, HAM-D scores and anorexia among the three groups. The results showed that Blautia was positively correlated with anorexia, HAM-D

scores, and CRP level, whereas *Faecalibacterium*, *Bacteroides*, *Roseburia*, and *Parabacteroides* were negatively correlated with anorexia, HAMD scores, and CRP level."

A Deeper Look Into Your Gut's Role in Mental Health

The differing microbial strains found in the fecal samples highlight the role of your gut microbiome in maintaining mental health. According to their findings, *Faecalibacterium*, *Bacteroides*, *Roseburia*, and *Parabacteroides* strains "are all beneficial bacteria that contribute to host health," and have the ability to produce short-chain fatty acids (SCFAs) in the digestive tract.⁹

For context, the production of SCFAs can modulate immune response and inflammation.¹⁰ That's because they act as "signaling molecules on both the gut cells and other tissue cells," due to their ability to bind with receptors to trigger intracellular signaling.¹¹

If you don't have enough SCFAs in your gut, you're more likely to be depressed. One potential reason for this is because butyrate, one of the SCFAs produced, has antidepressant-like effects,¹² which was verified by the BMC Psychiatry study¹³ cited earlier.

The researchers involved in the featured study theorize that lowered SCFAs caused by inflammation can predispose you to depression and eating disorders:¹⁴

"[A] decrease in SCFAs-producing bacteria in MDD patients may cause depression via an inflammatory response. These inflammatory molecules interfere with appetite and promote anorexia.

Inflammation in the hypothalamus has been shown to cause anorexia by upregulating serotonin availability and stimulating its signaling pathways in the hypothalamus. In addition, butyrate can cross the blood-brain barrier and affect appetite and feeding activities of the host by activating the vagus nerve ...

Furthermore, inflammation can increase oxidative stress, thereby stimulating the production of various proinflammatory mediators, leading to the formation of cell pores and substance leakage on the cell membrane, activation of multiple apoptotic factors, and ultimately resulting in neuronal cell death, which can lead to the onset of depression. All of these indicate the association between inflammation and anorexia, as well as MDD."

Restoring Your Microbiome Can Help Boost Digestive and Mental Health

Your gut and brain are inextricably linked via the gut-brain axis. While these two seem like they don't have anything in common, research has shown that much of your gut is controlled by the brain.¹⁵ So much so that it's even been dubbed the "second brain," since the gastrointestinal tract is lined with a network of nerve cells that are structurally similar structure to the human brain.¹⁶

Synthesizing all the established information together, we can see that a compromised gut microbiome may negatively impact your mood and eating habits. Therefore, restoring gut homeostasis may be a viable method to putting your health back on track.

This hypothesis was reviewed in a study¹⁷ published in the Journal of Eating Disorders. According to the researchers, they discovered a case study wherein an anorexic 26-year-old woman failed to maintain a healthy weight despite being on a diet totaling 2,500 calories. As an alternative, she was given a fecal transplant, which worked — she gradually gained 13.6% more weight over 36 weeks without side effects.

While fecal transplants are more experimental in nature compared to taking a probiotic supplement or eating fermented foods, it nonetheless shows the crucial role our gut microbiota has on overall health.

In another study,¹⁸ 21 participants receiving help for depression were given a probiotic supplement that contained eight different strains, such as Lactobacillus and Bifidobacterium for 31 days. Brain imaging scans, HAMD assessments and stool

samples were also taken at baseline and post-study. Based on their compiled analysis, the supplement helped with the test group:

"Probiotics maintained microbial diversity and increased the abundance of the genus Lactobacillus, indicating the effectivity of the probiotics to increase specific taxa. The increase of the Lactobacillus was associated with decreased depressive symptoms in the probiotics group ...

Our data imply that an add-on probiotic treatment ameliorates depressive symptoms (HAMD) along with changes in the gut microbiota and brain, which highlights the role of the MGB (microbiota-gut-brain) axis in MDD and emphasizes the potential of microbiota-related treatment approaches as accessible, pragmatic and non-stigmatizing therapies in MDD."

Boost Your Gut Health with These Strategies

Now that we've established the intricate link of probiotics with mental health, how do you go about nourishing your gut microbiome? I've already mentioned that taking a probiotic supplement and eating fermented foods may help. But that's just the tip of the iceberg.

That's because there are many other seemingly harmless habits that assault your gut microbiome. Hence, a multilayered approach is the best way to protect and nourish your gut health. You'll find my top recommendations below:

Do

Eat plenty of fermented foods — Healthy choices include lassi, fermented grass fed kefir, natto (fermented soy) and fermented vegetables. Make sure that all ingredients come from trusted organic sources.

Avoid

Antibiotics, unless absolutely necessary. If you do take them, make sure to reseed your gut with fermented foods and/or a high-quality probiotic supplement.

Do

Take a probiotic supplement — If you don't eat fermented foods on a regular basis, a probiotic supplement can be useful.

Boost your soluble and insoluble fiber intake, focusing on well-cooked vegetables and ripe fruits.

Get your hands dirty in the garden — Exposure to bacteria and viruses in soil can help strengthen your immune system and provide long-lasting immunity against disease.

Open your windows — Research shows opening a window and increasing natural airflow can improve the diversity and health of the microbes in your home, which in turn benefit you.¹⁹

Wash your dishes by hand instead of using the dishwasher — Washing your dishes by hand leaves more bacteria on the dishes than dishwashers do.

Eating off these less-than-sterile dishes

Avoid

Conventionally raised meats and other animal products, as CAFO animals are routinely fed low-dose antibiotics.

Chlorinated and/or fluoridated water — This includes during bathing or showering.

Processed foods — Excessive refined sugars, along with otherwise "dead" nutrients, feed pathogenic bacteria.

Food emulsifiers such as polysorbate 80, lecithin, carrageenan, polyglycerols and xanthan gum may also have an adverse effect on your gut flora.

Agricultural chemicals — Glyphosate (Roundup) is a known antibiotic and could potentially kill many of your beneficial gut microbes if you eat foods contaminated with it.

Antibacterial soap, as it kills off both good and bad bacteria and contributes to the development of antibiotic resistance.

Do

may decrease your risk of allergies by stimulating your immune system.²⁰

Avoid

Consider Minimizing Linoleic Acid to Protect Your Gut Further

In addition to the strategies mentioned above, it would be wise to avoid excess linoleic acid (LA) consumption. I believe that LA, an omega-6 polyunsaturated fat, is one of the most pernicious ingredients present in the food supply today. In my previous article "[Linoleic Acid – The Most Destructive Ingredient in Your Diet](#)," I highlighted the damage LA does to your metabolic health.

To be clear, LA, found in seed oils, is only toxic when consumed in excessive amounts. The problem is that many food manufacturers use LA in their products, which contributes to the rising rates of chronic disease we see today. Soybean, safflower, cottonseed, sunflower, canola and corn oils are the top culprits to avoid.²¹

As you can guess, LA may also impact gut health, specifically your good gut bacteria. In a 2020 study published in *Scientific Reports*,²² researchers found that LA induced metabolic stress in the *Bifidobacterium breve* (B. breve) strain. Specifically, "alterations to the amino-acid, carbohydrate and fatty-acid biosynthetic pathways were observed." These findings are quite concerning, as B. breve (as well as other *Bifidobacteria*) are linked to optimal health.

In a study²³ published in 2021, B. breve was noted to play a role in managing inflammation and psychological health – a compelling reinforcement to the importance of gut health among patients with MDD and anorexia. Moreover, the same study noted that B. breve may help promote immune function by promoting the growth of regulatory T cells and even attenuate endothelial dysfunction.²⁴

More recently, researchers from the University of California published a similar statement. In their study,²⁵ which used an animal model, they noted that high

consumption of soybean oil decreased the probiotics in the gut, while the presence pathogenic bacteria, namely *E. coli*, increased.

E. coli bacteria typically live in your gut without causing problems as they're kept in check by beneficial bacteria. But when gut dysbiosis occurs – which can be caused by excessive LA intake – the risk of disease can increase. According to the Cleveland Clinic, *E. coli* can cause bloodstream infections, watery diarrhea and even pelvic inflammatory disease.²⁶

So, what is the ideal LA intake? I recommend that you keep it below 5 grams a day, or better yet, 2 grams. Anything over 10 grams a day is likely to cause problems. To help you track your intake, I recommend diligently entering your meals using a nutritional calculator like [Cronometer](#).

Sources and References

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