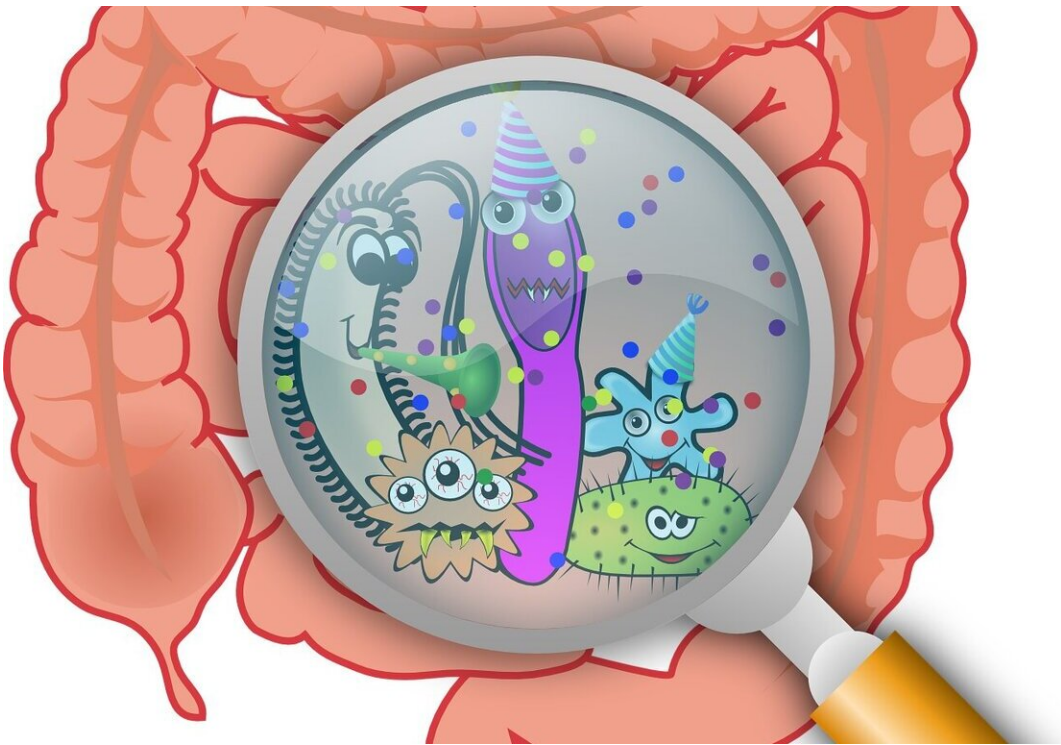


# New paper reviews gut microbiome health role in fighting depression during COVID-19 pandemic

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Researchers from Case Western Reserve University, University Hospitals Cleveland Medical Center (UH), BIOHM Health LLC, and the Louis Stokes Cleveland VA Medical Center have published a paper in

the *Frontiers of Nutrition*, proposing a hypothesis and theory about a microbiome-driven approach to combating depression during the COVID-19 pandemic.

In their paper, Mahmoud A. Ghannoum, Ph.D., FAAM, FIDSA, and colleagues, write that significant stressors brought about and exacerbated by COVID-19 are associated with startling surges in mental health illnesses, specifically those related to depressive disorders.

Within a one-month period at the beginning of the COVID-19 pandemic, the researchers write that there was a reported 34.1 percent increase in prescriptions for anti-anxiety medications, an 18.6 percent increase in antidepressant prescriptions, and a 14.8 percent increase in common anti-insomnia drugs including prescribed anti-insomnia medications in the United States.

"During such a short period of time, this steep rise hints at the magnitude of COVID-19's immediate and widespread effect on mental health," said Dr. Ghannoum, director of the Center for Medical Mycology at UH and professor of dermatology and pathology at the Case Western Reserve University School of Medicine.

In their paper, published Aug. 24, Dr. Ghannoum and colleagues examined the current literature surrounding the [microbiome](#) and gut-brain axis to advance a potential complementary approach to address depression and depressive disorders that have increased during the COVID-19 pandemic.

"The impact of the human gut microbiome on emotional health is a newly emerging field," said Dr. Ghannoum. "While more research needs to be conducted, the current evidence is extremely promising and suggests at least part of the answer to understanding depression in more depth may lie within the microbiome."

The microbiome is defined as the collective genomes of the microbes (composed of bacteria, fungi, protozoa and viruses) that live inside and on the human body, but primarily in the human gut. Scientists are learning that these microbes play a significant role in health and disease.

Studies also suggest the microbiome impacts our brain and emotions. The gut microbiome and the brain communicate with each other through neural, inflammatory, and hormonal signaling pathways. As a result of the two-way interaction between the gut microbiome and the brain, each can send messages that impact the other.

Dr. Ghannoum and colleagues propose that a microbiome-based holistic approach, which involves carefully annotating the microbiome and potential modification through diet, probiotics, and lifestyle changes, may address depression.

"Despite the toll that depression has on both individuals and society, understanding and effectively treating depressive disorders is difficult," Dr. Ghannoum said. "Current research addressing the diagnosis and treatment of depression and mood disorders is ongoing, but needs more time to develop the complexities involved how to treat them."

He said some studies have shed light on the potential correlation between COVID infection and microbiome disturbance, but have limitations that require further investigations with larger sample sizes to approximate the general population.

However, the researchers found more evidence supporting the gut-brain link and the relationship between depression and the gut microbiome. They see this connection as a potential new and more effective target for depression management.

"It is clear that the gut microbiome's makeup in individuals with

depressive disorders is disrupted and lacks the appropriate levels of beneficial microorganisms," said Dr. Ghannoum. "We believe that encouraging the growth of such beneficial microorganisms and rebalancing the gut microbiome in individuals may be a promising step toward helping individuals ease their depression via the gut-brain axis."

The researchers propose a multifaceted approach to manage depression that involves rebalancing and maintaining the gut microbiome through diet, probiotics, and specific lifestyle changes. Specifically, they call for:

- A healthy diet of fruits and vegetables. These nutritional factors appear to be associated with decreased depression rates, possibly due to their anti-inflammatory, neuroprotective, and prebiotic properties," said Dr. Ghannoum.
- Probiotics to serve the critical function of rebalancing the microbiome and treating [depression](#).
- Lifestyle habits, including exercise, sleep and stress reduction.

They write, "Not only should probiotic consumption restore the gut balance, it may also decrease the likelihood of colonization of the gut by opportunistic pathogens, as reported in many studies that analyzed the [gut microbiome](#) in COVID-19 infected patients."

**More information:** Mahmoud A. Ghannoum et al, A Microbiome-Driven Approach to Combating Depression During the COVID-19 Pandemic, *Frontiers in Nutrition* (2021). [DOI: 10.3389/fnut.2021.672390](https://doi.org/10.3389/fnut.2021.672390)

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