

Emotional well-being may be directly linked to women's gut health

April 27 2023



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Specific species of bacteria were present with higher abundances in women who reported being happier, more hopeful and having better emotion management skills

A new study by investigators from Brigham and Women's Hospital, a founding member of the Mass General Brigham healthcare system, and the Harvard T.H. Chan School of Public Health has linked bacteria in

our gut to [positive emotions](#) like happiness and hopefulness and healthier emotion management skills. Their results were published recently in *Psychological Medicine*.

Previous research has found that the brain communicates with the gastrointestinal tract through the gut-brain axis. One theory is that the [gut microbiome](#) plays a starring role in the gut-brain axis, linking physical and [emotional health](#).

"The gut contains trillions of microorganisms collectively known as the gut microbiome. Many studies have shown that disturbance in the gut microbiome can affect the gut-brain axis and lead to various health problems, including anxiety, depression and even neurological disorders," said co-corresponding author Yang-Yu Liu, Ph.D., an associate scientist in the Brigham's Channing Division of Network Medicine and an associate professor of Medicine at the Harvard Medical School.

"This interaction likely flows both ways—the brain can impact the gut, and the gut can impact the brain. The emotions that we have and how we manage them could affect the gut microbiome, and the microbiome may also influence how we feel," said first author Shanlin Ke, Ph.D., who worked on the study as a postdoctoral researcher in Liu's lab.

The gut-brain axis might affect physical health, as well. Previous research has shown that positive emotions and healthy emotional regulation are linked to greater longevity. In contrast, [negative emotions](#) are linked to higher rates of cardiovascular disease and mortality from all causes, according to study co-corresponding author Laura Kubzansky, Ph.D., a professor of Social and Behavioral Sciences in the Department of Social and Behavioral Sciences at the Harvard T.H. Chan School of Public Health.

The new study included more than 200 women from the Mind-Body Study, a sub-study of the Nurses' Health Study II. These middle-aged, mostly white women filled out a survey that asked about their feelings in the last 30 days, asking them to report positive (feeling happy or hopeful about the future) or negative (feeling sad, afraid, worried, restless, hopeless, depressed, or lonely) emotions they'd had. The survey also assessed how they handled their emotions.

The two options were reframing the situation to see it in a more positive light (cognitive reappraisal) or holding back from expressing their negative emotions (suppression). Suppressing one's feelings is often a less effective way of handling them and can lead to worse mental and physical health outcomes, co-first author Anne-Josée Guimond, Ph.D., who worked on the study as a postdoctoral researcher in Kubzansky's lab, said.

Three months after answering the survey, the women provided stool samples. The stool samples were analyzed using metagenomic sequencing. The team compared the results from the microbial analysis to the survey responses about emotions and ways of managing them to look for connections.

"Some of the species that popped up in the analysis were previously linked with poor health outcomes, including schizophrenia and cardiovascular diseases," Guimond said. "These links between emotion regulation and the gut microbiome could affect [physical health](#) outcomes and explain how emotions influence health."

The analysis found that people who suppressed their emotions had a less diverse gut microbiome. They also found that people who reported happier feelings had lower levels of Firmicutes bacterium CAG 94 and Ruminococcaceae bacterium D16. On the other hand, people who had more negative emotions had more of these bacteria.

"I was intrigued that positive and negative emotions often had consistently similar findings in opposite directions," Kubzansky said. "This is what you would expect, but kind of amazing to me that we saw it."

The researchers also examined what the microbes in the gut were doing on a functional pathway level, looking for links between changes in the capacity of this activity and specific emotional states and emotion regulation methods. They found that negative emotions were linked to lowered capacity activity in multiple metabolism-related actions.

This study was limited in that its subjects were mostly postmenopausal [white women](#). The emotion survey was also done at one point in time so that the researchers couldn't decipher the direction of the link. The researchers want to repeat the study with more diverse populations, a more extensive emotional survey, and longitudinal data. A more specific analysis of the microbial strains might also help develop microbiome-based therapeutics like probiotics to improve emotions and well-being.

More information: Shanlin Ke et al, Gut feelings: associations of emotions and emotion regulation with the gut microbiome in women, *Psychological Medicine* (2023). [DOI: 10.1017/S0033291723000612](https://doi.org/10.1017/S0033291723000612)

Provided by Brigham and Women's Hospital

Citation: Emotional well-being may be directly linked to women's gut health (2023, April 27) retrieved 18 April 2024 from <https://medicalxpress.com/news/2023-04-emotional-well-being-linked-women-gut.html>

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