

Discrimination May Lead to Unhealthy Gut-Brain Changes

Discrimination may help trigger unhealthy brain-gut crosstalk that contributes to inflammation, obesity, and other health problems.

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Discrimination—whether based on race, sex, disability, sexual orientation, or other factors—can be a significant source of stress. Correspondingly, discrimination has been linked to an increased risk of many health problems associated with stress.

One health problem that has a strong association with discrimination and stress is obesity. Racial minority groups in the U.S. that experience high levels of discrimination have higher rates of obesity and medical issues associated with obesity. But whether discrimination might directly contribute to the development of obesity isn't well understood.

In a new study, funded in part by NIH, a research team led by Dr. Arpana Gupta from the University of California, Los Angeles analyzed brain activity and compounds produced in the gut to look more closely at these links. Their results were published on October 2, 2023, in [Nature Mental Health](#).

The researchers recruited 107 volunteers from their local community. They assessed the participants' experience of lifetime discrimination based on responses to a series of questions. The responses were coded on a standard scale. Based on these scores, participants were divided into a high-discrimination group and a low-discrimination group.

All volunteers then underwent brain imaging while they were shown images of unhealthy and healthy foods. They were also asked how willing they were to eat those foods. People in the high-discrimination group had greater brain reactivity to all images of food than those in the low-discrimination group, especially to those of unhealthy sweet foods.

Brain areas where this activity increased included those involved in processing rewards and exercising self-control. People in the high-discrimination group also reported greater willingness to eat the unhealthy foods they were shown.

Two compounds related to glutamate were found at substantially higher levels in the guts of people in the high-discrimination group. Glutamate is a neurotransmitter—a chemical that helps

neurons communicate. High levels of these compounds have been associated with inflammation and obesity. Glutamate also plays a role in the brain's response to food cues. The higher levels of these compounds in the high-discrimination group were associated with the participants' greater response to food cues.

"Our results show that a person's brain-gut crosstalk may change in response to ongoing experiences of discrimination. [This may affect] food choices, cravings, brain function, and contribute to alterations in gut chemistry that have been implicated in stress and inflammation," Gupta says. "These alterations may ultimately cause people exposed to discrimination to be more vulnerable to obesity and obesity-related disorders."

The current research could only show a correlation between the perception of discrimination and unhealthy gut-brain changes. More work is needed to track how changes in the brain and body in response to discrimination impact health over time.

This [research summary](#) was published by the National Institutes of Health on October 24, 2023.