

Are body temperature and depression linked? New study says, yes

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People with depression have higher body temperatures, suggesting there could be a mental health benefit to lowering the temperatures of those with the disorder, a new UC San Francisco-led study found.

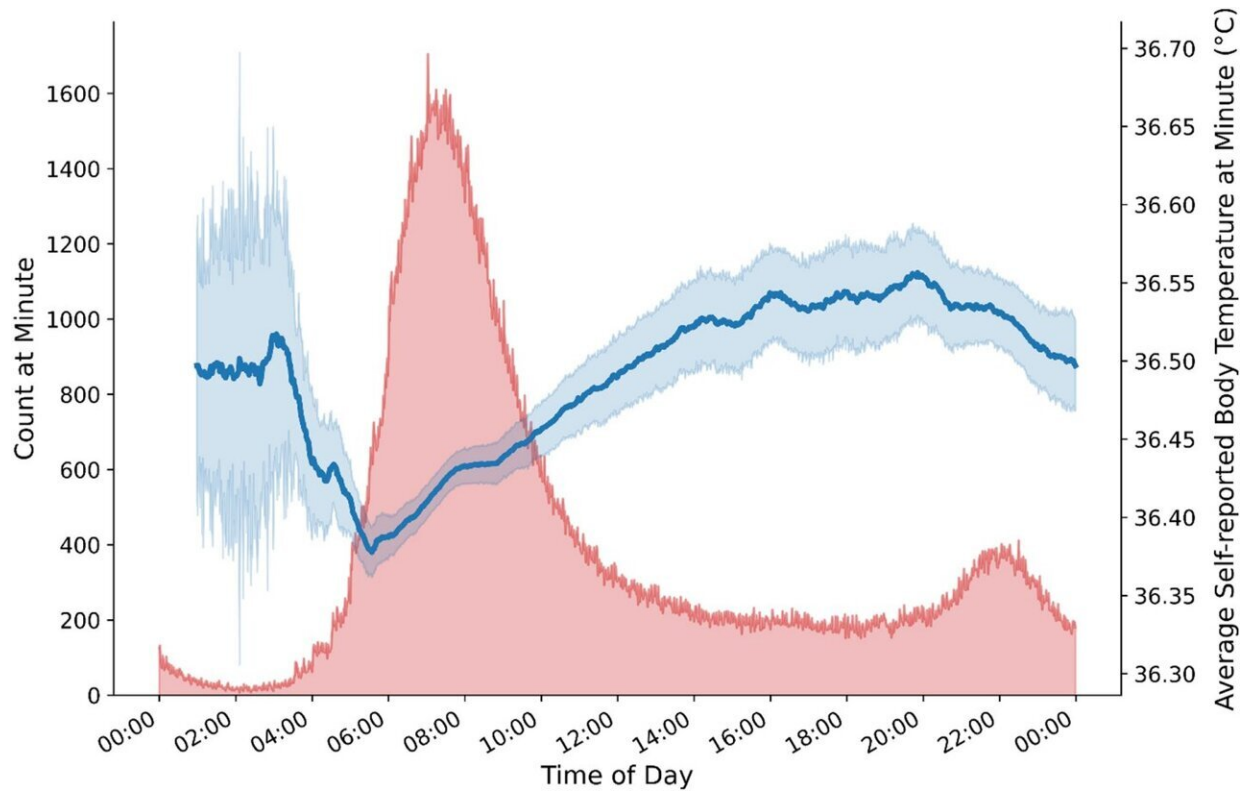
The study, [published](#) today in *Scientific Reports*, doesn't indicate whether depression raises body temperature or a higher temperature causes

depression. It's also unknown whether the higher body temperature observed in people with depression reflects decreased ability to self-cool, increased generation of heat from metabolic processes or a combination of both.

Researchers analyzed data from more than 20,000 international participants who wore a device that measures body temperature, and also self-reported their body temperatures and depression symptoms daily. The seven-month study began in early 2020 and included data from 106 countries.

The results showed that with each increasing level of depression symptom severity, participants had higher [body temperatures](#). The body temperature data also showed a trend toward higher depression scores in people whose temperatures had less fluctuation throughout a 24-hour period, but this finding didn't reach significance.

The findings shed light on how a novel depression treatment method might work, said Ashley Mason, Ph.D., the study's lead author and associate professor of psychiatry at UCSF Weill Institute for Neurosciences. A small body of existing, causal studies has found that using [hot tubs](#) or saunas can reduce depression, possibly by triggering the body to self-cool, for example, through sweating.



Average self-reported body temperature by time-of-day. Figure depicts expected diurnal pattern of lowest self-reported body temperatures reported in the early morning hours and higher self-reported body temperatures during daytime hours. Note. Blue line depicts average self-reported body temperature (right Y axis) by time of day; blue shading indicates standard error of the mean. Red shading indicates number of responses (left Y axis) provided at each minute (X axis). Credit: *Scientific Reports* (2024). DOI: 10.1038/s41598-024-51567-w

"Ironically, heating people up actually can lead to rebound body temperature lowering that lasts longer than simply cooling people down directly, as through an ice bath," said Mason, who is also a [clinical psychologist](#) at the UCSF Osher Center for Integrative Health. "What if we can track the body temperature of people with depression to time heat-based treatments well?"

"To our knowledge, this is the largest study to date to examine the association between body temperature—assessed using both self-report methods and wearable sensors—and [depressive symptoms](#) in a geographically broad sample," added Mason. "Given the climbing rates of [depression](#) in the United States, we're excited by the possibilities of a new avenue for treatment."

More information: Ashley E. Mason et al, Elevated body temperature is associated with depressive symptoms: results from the TemPredict Study, *Scientific Reports* (2024). [DOI: 10.1038/s41598-024-51567-w](https://doi.org/10.1038/s41598-024-51567-w)

Provided by University of California, San Francisco

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