

# Feeling depressed linked to short-term increase in body weight, study finds

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Increases in symptoms of depression are associated with a subsequent increase in body weight when measured one month later, new research from the University of Cambridge has found.

The study, published in *PLOS ONE*, found that the increase was only seen among people with overweight or obesity, but found no link between generally having greater symptoms of depression and higher body [weight](#).

Research has suggested a connection between weight and mental [health](#)—with each potentially influencing the other—but the relationship is complex and remains poorly understood, particularly in relation to how changes in an individual's mental health influence their body weight over time.

To help answer this question, researchers at Cambridge's Medical Research Council (MRC) Epidemiology Unit examined data from over 2,000 adults living in Cambridgeshire, UK, who had been recruited to the Fenland COVID-19 Study.

Participants completed digital questionnaires on mental well-being and body weight every month for up to nine months during the COVID-19 pandemic (August 2020–April 2021) using a mobile app developed by Huma Therapeutics Limited.

Questions assessed an individual's symptoms of depression, anxiety and perceived stress. A [higher score](#) indicated greater severity, with the maximum possible scores being 24 for depression, 21 for anxiety and 40 for stress. The team then used statistical modeling to explore whether having poorer mental well-being than usual was related to changes in body weight one month later.

The researchers found that for every increment increase in an individual's usual score for depressive symptoms, their subsequent weight one month later increased by 45g. This may seem small but would mean, for example, that in an individual whose depressive symptoms score rose from five to 10 (equal to an increase from 'mild' to

'moderate' depressive symptoms) it would relate to an average [weight gain](#) of 225g (0.225kg).

This effect was only observed in those individuals with overweight (defined as BMI 25–29.9kg/m<sup>2</sup>) or with obesity (BMI of over 30kg/m<sup>2</sup>). Individuals with overweight had on average an increase of 52g for each increment point increase from their usual depressive symptoms score and for those with obesity the comparable weight gain was 71g. The effect was not seen in those individuals with a healthy weight.

First author Dr. Julia Mueller from the MRC Epidemiology Unit said, "Overall, this suggests that individuals with overweight or obesity are more vulnerable to weight gain in response to feeling more depressed. Although the weight gain was relatively small, even small weight changes occurring over short periods of time can lead to larger weight changes in the long term, particularly among those with overweight and obesity.

"People with a high BMI are already at greater risk from other [health conditions](#), so this could potentially lead to a further deterioration in their health. Monitoring and addressing [depressive symptoms](#) in individuals with overweight or obesity could help prevent further weight gain and be beneficial to both their mental and physical health."

The researchers found no evidence that perceived stress or anxiety were related to changes in weight.

Senior author Dr. Kirsten Rennie from the MRC Epidemiology Unit said, "Apps on our phones make it possible for people to answer short questions at home more frequently and over extended periods of time, which provides much more information about their well-being. This technology could help us understand how changes in mental health influence behavior among people with overweight or obesity and offer ways to develop timely interventions when needed."

Although previous studies have suggested that poor [mental health](#) is both a cause and consequence of [obesity](#), the research team found no evidence that weight predicted subsequent symptoms of depression.

**More information:** Mueller, J et al. The relationship of within-individual and between-individual variation in mental health with bodyweight: An exploratory longitudinal study, *PLoS ONE* (2024). [DOI: 10.1371/journal.pone.0295117](#)

Provided by University of Cambridge

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