

# Financial stress linked to worse biological health, finds study

January 22 2024

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People who experience stressful life events or circumstances are more likely to have worse biological health, as indicated by biomarkers involved in the interaction between our immune, nervous and endocrine

systems, according to a new study by UCL researchers.

The study, [published](#) in the journal *Brain, Behavior and Immunity*, found that not only major stressful experiences such as bereavement but chronic challenges such as financial strain were detrimental to the healthy interaction of these systems.

Communication between our immune, nervous, and endocrine systems is necessary to maintain [good health](#). Disruption of these processes is linked to a wide range of mental and physical illnesses, from cardiovascular disease to depression and schizophrenia.

When a threat like stress occurs, signals between the immune, nervous, and endocrine systems are activated and spur physiological and behavioral changes.

In this new study, the researchers analyzed blood concentrations of four biomarkers in 4,934 people aged 50 and over who were participants of the English Longitudinal Study of Aging. Two of these were proteins involved in the [innate immune response](#) to inflammation (C-reactive protein and fibrinogen), and two were hormones involved in the physiology of the stress response (cortisol and IGF-1).

The team used a sophisticated statistical technique, latent profile analysis, to identify clusters of biomarker activity. Three groups were identified and labeled as low risk to health, moderate risk, and high risk. The researchers then looked at how earlier exposure to stressful circumstances might affect people's likelihood of being in the high-risk group.

They found that exposure to stressful circumstances overall, ranging from being an informal caregiver to experiencing a bereavement or divorce in the last two years, was linked to a 61% increase in likelihood

of belonging to the high-risk group four years later.

Separately, the effect was also cumulative, as the likelihood of belonging to the high-risk group increased by 19% for each stressor experienced, for those who experienced more than one stress-inducing circumstance.

People who reported only financial strain—the perception that they may not have enough financial resources to meet their future needs—were 59% more likely, four years later, to belong to the high-risk group.

Lead author, Ph.D. candidate Odessa S. Hamilton (UCL Institute of Epidemiology & Health Care), said, "When the immune and neuroendocrine systems function well together, homeostasis is maintained and health is preserved. But [chronic stress](#) can disrupt this biological exchange and lead to disease.

"We found that financial stress was most detrimental to biological health, although more research is needed to establish this for certain. This may be because this form of stress can invade many aspects of our lives, leading to family conflict, social exclusion, and even hunger or homelessness."

Experiencing stress over a prolonged period of time can disturb the communication between the immune and neuroendocrine systems. That is because our response to [stress](#) is similar to our response to sickness, activating some of the same pathways (for instance, both responses trigger the production of immune system signals called pro-inflammatory cytokines).

The researchers also looked at genetic variants previously found to influence our immune-neuroendocrine response and found that the association between stressful life circumstances and belonging to the high-risk group four years later remained true irrespective of genetic

predisposition.

**More information:** Odessa S. Hamilton et al, Immune-neuroendocrine patterning and response to stress. A latent profile analysis in the English longitudinal study of ageing, *Brain, Behavior, and Immunity* (2023).

[DOI: 10.1016/j.bbi.2023.11.012](https://doi.org/10.1016/j.bbi.2023.11.012)

Provided by University College London

Citation: Financial stress linked to worse biological health, finds study (2024, January 22)  
retrieved 8 May 2024 from

<https://medicalxpress.com/news/2024-01-financial-stress-linked-worse-biological.html>

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