

Physical activity lowers cardiovascular disease risk by reducing stress-related brain activity, study finds

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New research indicates that physical activity lowers cardiovascular disease risk in part by reducing stress-related signaling in the brain.

In the study, which was led by investigators at Massachusetts General Hospital (MGH), a founding member of the Mass General Brigham health care system and published in the *Journal of the American College of Cardiology*, people with stress-related conditions such as depression experienced the most cardiovascular benefits from physical activity.

To assess the mechanisms underlying the psychological and cardiovascular disease benefits of physical activity, Ahmed Tawakol, MD, an investigator and cardiologist in the Cardiovascular Imaging Research Center at Massachusetts General Hospital, and his colleagues analyzed [medical records](#) and other information of 50,359 participants from the Mass General Brigham Biobank who completed a physical activity survey.

A subset of 774 participants also underwent brain imaging tests and measurements of stress-related brain activity.

Over a median follow-up of 10 years, 12.9% of participants developed cardiovascular disease. Participants who met physical activity recommendations had a 23% lower risk of developing cardiovascular disease compared with those not meeting these recommendations.

Individuals with higher levels of physical activity also tended to have lower stress-related brain activity. Notably, reductions in stress-associated brain activity were driven by gains in function in the [prefrontal cortex](#), a part of the brain involved in executive function (i.e., decision making, impulse control) and is known to restrain stress centers of the brain. Analyses accounted for other lifestyle variables and [risk factors](#) for coronary disease.

Moreover, reductions in stress-related brain signaling partially accounted for physical activity's cardiovascular benefit.

As an extension of this finding, the researchers found in a cohort of 50,359 participants that the cardiovascular benefit of exercise was substantially greater among participants who would be expected to have higher stress-related brain activity, such as those with pre-existing depression.

"Physical activity was roughly twice as effective in lowering [cardiovascular disease risk](#) among those with depression. Effects on the brain's stress-related activity may explain this novel observation," says Tawakol, who is the senior author of the study.

"Prospective studies are needed to identify potential mediators and to prove causality. In the meantime, clinicians could convey to patients that [physical activity](#) may have important brain effects, which may impart greater cardiovascular benefits among individuals with stress-related syndromes such as depression."

More information: Hadil Zureigat et al, Effect of Stress-Related Neural Pathways on the Cardiovascular Benefit of Physical Activity, *Journal of the American College of Cardiology* (2024). DOI: 10.1016/j.jacc.2024.02.029 , [dx.doi.org/10.1016/j.jacc.2024.02.029](https://doi.org/10.1016/j.jacc.2024.02.029)

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