

Stress is a health hazard, but a supportive circle of friends can help undo the damaging effects on your DNA

November 22 2021, by Divya Mehta



Credit: AI-generated image ([disclaimer](#))

Stress affects [up to 90% of people](#), and we know it harms our mental and physical well-being.

Stress can impact the activity and function of our [genes](#). It does this via

"epigenetic" changes, which turn on and off certain genes, though it doesn't change the DNA code.

But why do some people respond worse to stress, while others seem to cope under pressure?

[Previous research](#) has identified having strong [social support](#) and a sense of belonging are robust indicators of physical and [mental health](#).

Social support means having a network you can turn to in times of need. This can come from natural sources such as family, friends, partners, pets, co-workers and [community groups](#). Or from formal sources such as mental health specialists.

My new study, [published today in the *Journal of Psychiatric Research*](#), shows for the first time that these positive effects are also observed on human genes.

Having supportive social structures buffers and even reverses some of the harmful effects of stress on our genes and health, via the process of epigenetics.

The findings suggest the DNA we are born with is not necessarily our destiny.

What is epigenetics?

Our genes and our environment contribute to our health.

We inherit our DNA code from our parents, and this doesn't change during our life. Genetics is the study of how the DNA code acts as a risk or protective factor for a particular trait or disease.

[Epigenetics](#) is an additional layer of instructions on top of DNA that determines how they affect the body. This layer can chemically modify the DNA, without changing DNA code.

The term epigenetics is derived from the Greek word "epi" which means "over, on top of."

This extra layer of information lies on top of the genes and surrounding DNA. It acts like a switch, turning genes on or off, which can also impact our health.

Epigenetic changes occur throughout our lives due to different environmental factors such as stress, exercise, diet, alcohol, and drugs.

For instance, [chronic stress](#) can impact our genes via epigenetic changes that in turn can [increase the rate of mental health disorders](#) such as post-traumatic stress disorder (PTSD), depression and anxiety.

New technologies now allow researchers to collect a biological sample from a person (such as blood or saliva) and measure epigenetics to better understand how our genes respond to different environments.

Measuring epigenetics at different times allows us to gain insight into which genes are altered because of a particular environment.

What did we study?

[My study](#) investigated both positive and negative factors that drive a person's response to stress and how this changes the epigenetic profiles of genes.

Certain groups of people are more likely to face stress as a part of their routine work, such as emergency responders, medical workers and police

officers.

So, my research team and I recruited 40 Australian first year paramedical students at two points in time—before and after exposure to a potentially stressful event. The students provided saliva samples for DNA and filled out questionnaires detailing their lifestyle and health at both points in time.

We investigated epigenetic changes before and after exposure to stress, to better understand:

- how epigenetics of genes was altered after exposure to stress
- which social and psychological factors caused the epigenetic changes.

We found stress influenced epigenetics and this in turn led to increased rates of distress, anxiety, and depressive symptoms among participants.

However, students who reported high levels of perceived social support showed lesser levels of stress-related health outcomes.

Students with a strong sense of belonging to a group, organization, or community dealt much better with stress and had reduced negative [health](#) outcomes following exposure to stress.

Both these groups of students showed fewer [epigenetic changes](#) in genes that were altered as a result of stress.

COVID has made us more isolated

The COVID pandemic has created heavy psychological and emotional burdens for people due to uncertainty, altered routines and financial pressures.

In Australia, the rates of anxiety, depression and suicide have soared since the start of the pandemic. [One in five Australians](#) have reported high levels of psychological distress.

The pandemic has also made us more isolated, and our relationships more remote, having a profound impact on social connections and belonging.

Strange physical symptoms? Blame the chronic stress of life during the COVID-19 pandemic <https://t.co/ZgCnWtrWSA> via [@HarknessMoodlab](#)

— Ash Paul (@pash22) [June 13, 2020](#)

My study highlights how family and community support, and a sense of belonging, influence our genes and act as a protective factor against the effects of [stress](#).

In such unprecedented and stressful times, it's vital we build and maintain strong social structures that contribute to good physical and mental well-being.

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