

# How teens deal with stress may affect their blood pressure, immune system

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Credit: Jourden C/public domain

Most teens get stressed out by their families from time to time, but

whether they bottle those emotions up or put a positive spin on things may affect certain processes in the body, including blood pressure and how immune cells respond to bacterial invaders, according to Penn State researchers.

The researchers explored whether the strategies adolescents used to deal with chronic family stress affected various metabolic and immune processes in the body. Strategies could include [cognitive reappraisal](#)—trying to think of the stressor in a more positive way—and suppression, or inhibiting the expression of emotions in reaction to a stressor.

The team found that when faced with greater chronic family stress, teens who used cognitive reappraisal had better metabolic measures, like [blood pressure](#) and waist-to-hip ratio. Teens who were more likely to use suppression tended to have more inflammation when their [immune cells](#) were exposed to a bacterial stimulus in the lab, even in the presence of anti-inflammatory signals.

Hannah Schreier, assistant professor of biobehavioral health at Penn State, said the results suggest that the coping skills teens develop by the time they are adolescents have the potential to impact their health later in life.

"These changes are not something that will detrimentally impact anyone's health within a week or two, but that over years or decades could make a difference," Schreier said. "That may be how [small changes](#) in metabolic or inflammatory outcomes may become associated with poorer health or a greater chance of developing a chronic disease later in life."

Emily Jones, graduate student in biobehavioral health at Penn State, said the results—recently published in *Psychosomatic Medicine*—help

therapists and counselors better work with children and adolescents who live in stressful environments.

"Exposure to [chronic stress](#) doesn't always lead to poorer health outcomes, in part because of differences among people," Jones said. "As our study findings suggest, there may be ways to help someone be more resilient in the face of stress by encouraging certain emotion regulation strategies. For children in stressful living situations, we can't always stop the stressors from happening, but we may be able to help youth deal with that stress."

Although previous research has linked chronic stress during childhood with such conditions as depression, autoimmune disorders and cardiovascular disease, the researchers said less is known about why some people under chronic stress develop these conditions while others do not. While it was thought that [emotional](#) regulation may play a role, the researchers were not sure exactly how.

To better explore how different ways of regulating emotions can affect different aspects of physical health, the researchers gathered data from 261 adolescents between the ages of 13 and 16 years.

The researchers interviewed the participants about the relationships and chronic stress within their families, as well as measured the participants' waist-to-hip ratios and blood pressure. The adolescents also completed questionnaires about how they regulated their emotions.

To measure immune function, the researchers took blood samples from each participant and exposed the blood to a bacterial stimulus—both with and without the anti-inflammatory substance hydrocortisone—to see how the immune cells would respond.

The researchers found that under conditions of greater chronic family

stress, the immune cells of adolescents who were more likely to use suppression also tended to produce more [pro-inflammatory cytokines](#), molecules that signal to other cells that there is a threat present and that the body's immune system needs to kick into gear.

The cells of these teens produced more cytokines even in the presence of hydrocortisone, an anti-inflammatory substance that usually tells the body to slow down on producing cytokines.

"Cytokines are like messengers that communicate to the rest of the body that added support is needed," Jones said. "So when you have a high level of these pro-inflammatory cytokines, even in the presence of anti-inflammatory messages from cortisol, it may suggest that your body is mounting an excessive inflammatory response, more so than necessary. It suggests that the immune system may not be functioning as it should be."

Meanwhile, the researchers found that adolescents who tended to use cognitive reappraisal while under more family stress had smaller waist-to-hip ratios—a measurement used as an indicator of health and chronic disease risk—and lower blood pressure.

"While we would have to follow up with more studies, the results could lend support to the idea that reappraising a situation during times of stress could be beneficial," Jones said. "For a mild stressor, this could be as simple as reframing a bad situation by thinking about it as a challenge or an opportunity for growth."

The researchers added that opportunities for future studies could include looking at the effects of emotion regulation strategies on these metabolic and immune measures over time to tease apart how the family environment shapes emotion regulation, how emotion regulation may itself influence stress exposure, and how chronic family [stress](#) and

emotion regulation together can affect chronic disease risk in the long run.

**More information:** Emily J. Jones et al, Chronic Family Stress and Adolescent Health, *Psychosomatic Medicine* (2018). [DOI: 10.1097/PSY.0000000000000624](https://doi.org/10.1097/PSY.0000000000000624)

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