Medical Xpress

How mindset could affect the body's response to vaccination

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A medical assistant prepares a dose of a COVID-19 vaccine to be administered to a patient. Credit: Public domain image courtesy of Lisa Ferdinando, U.S. Department of Defense

In a recent study, researchers found that beliefs and assumptions people have about COVID-19 vaccines seemed to influence their vaccination experience—including side effects and, in some cases, immune response.

It's that time of year again—vaccine season. While most people can appreciate that vaccination is an amazing achievement, their enthusiasm might falter when it comes time to schedule and receive their own. And new research suggests that might influence how the vaccine affects them.

Researchers at Stanford University, Miami University, and the University of California, San Francisco, studied the effects of different types of positive and negative mindsets regarding the COVID-19 vaccine.

Their work, published in the journal *Brain, Behavior & Immunity—Health*, suggests that a positive mindset is associated with more positive outcomes, such as less stress and side effects, better mood, and possibly even better immune response.

Details of the findings include:

- All positive vaccine-related mindsets predict lower anxiety on the day of the appointment, and lower stress and sadness—and more happiness—in the days around vaccination.
- A positive mindset about the efficacy of the vaccine and how the body will respond to vaccination were linked to fewer negative physical side effects.
- The vaccine mindset that side effects indicate "the vaccine is working" was associated with better immune response—specifically, higher antibodies six months later.

"Many people will be surprised by these findings, but they shouldn't be," said the authors. "Our brains are connected to every physiological system in our bodies, and we know from decades of previous research on placebo effects and psychoneuroimmunology that our mindsets can influence physiological outcomes, including the immune system."

Below, study authors Darwin Guevarra of Miami University and UCSF, Alia Crum of Stanford, and Elissa Epel, BA, of UCSF describe some of the most important takeaways from their study and share how people can apply this science to try to improve their own vaccine experiences.

What is the #1 lesson you'd want people to take away from this study?

Mindsets are beliefs and assumptions about how the world works that can impact what people experience, feel, and do. The main lesson from the study is that your mindsets about vaccines can impact your post-vaccination experience in terms of how you feel, the side effects you experience, and, in some cases, your immune response.

In this study, we were specifically interested in a number of different mindsets, including the mindset that the vaccine will work, the mindset that your body will be responsive to the vaccine, and the mindset that side effects are signs that the vaccine is working.

All the mindsets were associated with more positive experiences with the vaccine to some degree (e.g., less anxiety or fewer side effects). However, the mindset about side effects was most strongly associated with a stronger neutralizing antibody response, a physiological marker of vaccine efficacy.

This being said, it might be easy to misinterpret the findings as "mindsets about the vaccine directly cause better vaccination outcomes." However, this study only shows a correlation between mindset and outcomes, meaning we cannot say the link is causal. Additional experiments are needed to claim causality.

Why are the results related to side effects important?

The findings regarding side effects mindset are particularly important because fear of side effects is the most common reason for vaccine hesitancy. While we cannot deny the reality of vaccine side effects, we can accurately inform people that many side effects are signs that the vaccine is working to boost your immune response.

Common side effects of the vaccines, like muscle soreness, headache, and fever, are encouraging indications that the vaccine is working as it should and the body is building immunity to COVID-19. In fact, in a separate paper based on this same group of participants, the results showed that greater sickness symptoms—assessed through self-reporting and a bio-sensor—predicted stronger long-term antibody response.

Yet many people don't seem to recognize this—and this is a missed opportunity. Helping people to rethink side effects as positive signs can transform them from an unpleasant sensation into a favorable signal. This can improve the vaccine experience and may even lead to a better immune response.

If someone already has a negative or anxious mindset about the vaccine, what can they do to develop a more positive mindset?

People can move to more positive mindsets about the vaccine simply by being more informed about the true effects and mechanisms of the vaccine. In doing this, they should lean on accurate information that educates them about how vaccines work and, in particular, work to understand that side effects are often a sign that the vaccine is doing its job. Side effects are not entirely random.

The COVID-19 vaccines give your body a practice run against the virus, teaching it what COVID-19 looks like and helping your body build

COVID-19-neutralizing antibodies. This results in immunity because now your body has, within it, what it needs to fight the virus should it encounter it again.

Sometimes this process causes side effects. And side effects like muscle stiffness, soreness, aches, headaches, nausea, and generally feeling under the weather, are part of the body's biological processes promoting vaccine's efficacy.

Is there anything else you want people to understand about this topic?

It's important to remember that our body's responses to anything—the medications we take, the foods we eat, and the stress we experience—are influenced by our mindsets as well as the objective properties of those things. And this is also true of the COVID-19 vaccine.

Our mindsets about the vaccine can affect not just how we feel afterward but also our experience with side effects. And in some instances, your mindset about the vaccine's side effects can potentially influence your immune response.

More information: Darwin A. Guevarra et al, Examining the association of vaccine-related mindsets and post-vaccination antibody response, side effects, and affective outcomes, *Brain, Behavior, & Immunity - Health* (2024). DOI: 10.1016/j.bbih.2024.100818

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