

# Understanding subjective beliefs could be vital to tailoring more effective treatments for depression and ADHD

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Taking into account whether people believe they are receiving a real treatment or a fake one (placebo) could provide better insights that could

help improve interventions for conditions such as depression and ADHD.

A team of psychologists led by Professor Roi Cohen Kadosh from the University of Surrey analyzed five independent studies that covered different types of neurostimulation treatments to understand the role of patients' subjective beliefs. These patients included both clinical patients being treated for ADHD and depression, as well as healthy adults.

The study found that patients' beliefs about whether they were receiving real or placebo treatments explained the treatment outcomes in four of the five studies. On some occasions, the subjects' beliefs explained the treatment's results better than the actual treatment itself. Assumptions about the treatment intensity also played a significant role in the treatment.

Professor Roi Cohen Kadosh from the University of Surrey said that the results have provided a twist that scientists must consider in future research:

"The common wisdom is that the same [medical treatment](#) would produce similar results across patients, but our latest study suggests a fascinating twist. While you'd expect uniform improvements in a group of people with depression undergoing the same neurostimulation treatment, outcomes can vary widely.

"What's truly eye-opening is that this variability could be largely influenced by the participants' own beliefs about the treatment they're receiving. In essence, if an individual believes they're receiving an effective treatment—even when given a placebo—that belief alone might contribute to significant improvements in their condition."

In the first study analyzed, 121 participants were treated with different

forms of Transcranial Magnetic Stimulation (rTMS) for depression. The results showed that participants' perceptions about receiving real or placebo treatment mattered more than the actual type of rTMS in reducing depression.

The second study involved 52 older people with late-life depression who received either a real or placebo of deep rTMS. Surrey researchers found that the effect of treatment on reducing depression scores depended on the combination of the participants' perceptions about receiving real or placebo treatment and the actual treatment they received.

In the third dataset, researchers investigated the effects of home-based Transcranial Direct Current Stimulation (tDCS) treatment on 64 adults diagnosed with ADHD. At the end of the study, participants' beliefs about the treatment they thought they had received were also collected. This study differed from the first two as both the subjects' beliefs and the actual treatment had a dual effect on reducing inattention scores.

In the fourth study, 150 healthy participants got varying doses of tDCS for mind wandering. Those who believed they got a more potent dose reported more mind wandering, even if the actual treatment wasn't a factor.

The fifth study analyzed the impact of transcranial random noise stimulation on working memory. Unlike previous studies, participants' beliefs didn't affect the results, highlighting the varying influence of beliefs in brain stimulation research. Thus, Roi Cohen Kadosh and his team show how subjective beliefs can vary in their effect on research—from fully explaining results beyond the actual treatment to interacting with the treatment to having no influence at all.

Dr. Shachar Hochman, a co-author on this work from the University of

Surrey, said, "The concept that a placebo or sham treatment can mimic genuine treatment effects is well-established in science. While researchers have closely monitored this phenomenon, it has been typically cataloged separately from the in-depth analyses of the actual treatment outcomes."

"What sets our study apart is that we have brought together these two datasets—subjective beliefs and objective treatment measures. This has the potential to reveal new insights into treatment efficacy."

Professor Roi Cohen Kadosh added, "Our findings show that there could be real value in recording participants' subjective beliefs at multiple points in the experiment to better understand their impact and put forward the importance of sharing this data and incorporating it within the research process."

"Recording beliefs might be useful beyond the realms of neurostimulation—we may find similar results in pharmacological studies and more state-of-the-art interventions such as [virtual reality](#), and I would encourage other scientists to use our [analytical approach](#) to re-examine results in past interventions and to incorporate it in future ones."

The study has been [published](#) in *eLife*.

**More information:** Luisa Fassi et al, The Importance of Individual Beliefs in Assessing Treatment Efficacy: Insights from Neurostimulation Studies, *eLife* (2023). [DOI: 10.7554/eLife.88889.1](https://doi.org/10.7554/eLife.88889.1)

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