# Viewing nature scenes reduces brain pain response in MRI study



A recent study conducted by environmental neuroscientist Maximilian Steininger and colleagues at the University of Vienna provides new insights into how nature scenes can reduce physical pain by altering neural responses in the brain. Previous research has established the broad benefits of natural environments for mental and physical health, but this study sought to objectively measure pain reduction linked to viewing nature, moving beyond self-reported data which could be influenced by psychological biases such as placebo effects.

The study, published in Nature Communications, used a controlled experimental approach with paid volunteers who received calibrated electrical shocks to their hands. The intensity of the shocks was individually adjusted to a level deemed painful but bearable by each participant. While inside an MRI machine, volunteers were shown three types of video scenes on embedded screens: an idyllic natural landscape featuring a lake, trees, grasslands, and mountains accompanied by natural sounds such as birdsong and water; an urban lake scene with skyscrapers, garbage cans, and city noises including construction sounds; and an office desk scene with typical indoor noises like computers and fans. Both painful and non-painful shocks were administered during the viewing to gauge neural responses to pain under different environmental visual and auditory stimuli.

MRI scans revealed that participants watching the natural scene exhibited a significantly reduced neural response to painful stimuli, particularly in areas of the brain responsible for processing nociceptive (pain) signals. In contrast, participants viewing the city or office scenes showed no difference in brain activity related to pain response. This finding suggests that viewing natural environments can modulate the brain’s processing of pain signals. Steininger noted, “The processing of this signal was changed when watching nature,” challenging the prior assumption that pain relief associated with nature was primarily a placebo effect.

The mechanism behind this pain reduction may be related to nature’s ability to promote emotional well-being and reduce stress, or because natural scenes provide engaging yet non-demanding stimuli, which distracts the brain from processing pain signals as intensely. Steininger explained, “In line with that theory, my suggestion would be that what was seen here was a very pronounced distraction effect.” The study’s findings are comparable to effects observed in mindfulness practices studied in pain management.

These discoveries have practical implications for clinical settings. Hospitals, often characterised by stressful, noisy, and artificial environments, might improve pain management outcomes by incorporating natural features into architectural design or by using virtual nature experiences through screens or virtual reality. Steininger emphasised the potential of virtual nature to assist patients, particularly when natural surroundings are not physically accessible: “Environmental aspects are important, and they should be considered when we talk about approaches to pain management, or when we talk about how healthcare facilities can be designed.”

This study contributes to a growing body of research highlighting the tangible physical benefits of nature exposure and suggests innovative non-pharmacological approaches for pain management founded on environmental and psychological science.

The Discover Magazine is reporting.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

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