A study published in *Frontiers in Psychiatry* found evidence to suggest that yoga breathing exercises can lead to improvements in emotional regulation. After pranayama training, participants showed decreased anxiety and negative affect, and changes in areas of the brain related to emotional processing. Pranayama refers to a set of techniques for controlling the breath and involves the practice of regulating inhalation, retention, and exhalation. These breathing exercises have been linked to positive physiological changes in the body, including cardiovascular improvements. There is evidence to suggest that the practice may have positive psychological effects, too.
While some studies have suggested that yogic breathing leads to improvements in emotional regulation, little empirical study has considered how these changes may be presented in the brain.

Study authors Morgana M. Novaes and her team wanted to explore how pranayama training would influence subjects’ self-reported mood and anxiety within a randomized, controlled study. Additionally, the researchers investigated activity in the brain network implicated in the processing of emotions, using functional magnetic resonance imaging (fMRI).

Thirty young people with an average age of 25 were assigned to one of two conditions. The experimental group took part in a 5-day pranayama training, followed by four weeks of regular pranayama practice. The four weeks involved three supervised 30-minute practices a week and two at-home practices. The control group also attended supervised meet-ups but took part in nonrelated activities such as crosswords and card games.

Both groups completed measures of state and trait affect and anxiety, and fMRI assessments. The fMRI assessments were taken during an emotional regulation task and at resting state. All participants were assessed at baseline, and again immediately after the four-week training.

After analyzing the data, the researchers uncovered significant differences between the two groups. The pranayama group showed decreased state anxiety, decreased negative affect, and increased positive affect following the yoga breathing intervention.

Moreover, the two groups showed differences in fMRI activity. The group who practiced pranayama breathing exercises showed changes in areas of the brain implicated in emotion processing, including the amygdala, anterior cingulate cortex (ACC), anterior insula, dorsolateral prefrontal cortex, ventromedial prefrontal cortex, and ventrolateral prefrontal cortex.

“The amygdala has been the most cited brain region in studies related to emotion processing. This structure is part of the limbic system and has been particularly associated with negative emotions . . . We found that changes in the amygdala activity were correlated with changes in negative affect,” Novaes and colleagues report.
The authors discuss several possible mechanisms through which pranayama might affect emotional regulation. As they point out, research suggests that attention and awareness can affect emotional regulation and that brain activity in the insula, ACC, and amygdala determines the emotional impact of a stimulus.

“In line with this hypothesis,” the researchers say, “it has been suggested that the practice of meditation is associated with decreased activity in the amygdala in response to emotional stimuli, besides suggesting the influence of meditation particularly in the insula, ACC, and thalamus. Therefore, bottom-up models of emotion regulation seem to better fit the observed brain changes related to contemplative practices, such as meditation and pranayama.”

Although preliminary and exploratory, these findings pave the way for future studies, by suggesting for the first time that pranayama breathing techniques are linked to reduced anxiety and increased positive affect, accompanied by changes in the brain network involved in emotion processing.

The study, “Effects of Yoga Respiratory Practice (Bhastrika pranayama) on Anxiety, Affect, and Brain Functional Connectivity and Activity: A Randomized Controlled Trial”, was authored by Morgana M. Novaes, Fernanda Palhano-Fontes, Heloisa Onias, Katia C. Andrade, Bruno Lobão-Soares, Tiago Arruda-Sanchez, Elisa H. Kozasa, Danilo F. Santaella, and Draulio Barros de Araujo.