

Unleashing the Potential of Breath: How Controlled Breathing Shapes Brain Rhythms and Enhances Mental Well-Being

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“My dad was diagnosed with cancer and passed away quickly. I was homeless, sleepless, consuming 5 grams of meth and heroin a day, selling a lot of drugs, and had some serious felony charges” recalled Joey Jackson. He had no idea that a 20 mins daily breathing practice of SKY (Sudarshan Kriya Yoga) could be instrumental in his recovery and current wellbeing.

As a breathwork and meditation instructor, I travel places, sometimes to lesser-known ones like Ashtabula in Ohio. The city, which was once industrially booming, now faces issues like economic distress, opioid and drug addiction. I first met Joey four years back when I was invited by a friend to lead a breathwork session of SKY in Ashtabula. He had tried extended recovery programs in the past but was repeatedly falling back to his addiction. “It was effortless. My mind became still and there was a sense of calm and peace that I had never experienced before”, recalled Joey from his first breathwork session. He is currently working two jobs, finishing up school with 4.0 GPA at Eastern Gateway Community College in Ohio, and has not taken any drugs since last four years.

According to a recent [report](#) from Centers for Disease Control and Prevention, an increasing number of adults are now seeking mental health treatment. A [CNN survey](#) also found that 90% of the US adults believe there is a national mental health crisis. When offering the breathing workshops, I meet people from all walks of life: college students, professionals, homemakers, or those in opioid misuse recovery. Where on one end there is a common need to find healthy and sustainable ways to cope with mental stress, on the other I am surprised to see how few minutes of rhythmic breathing can bring a tangible shift in their mental space.

How breathwork positively affects our brain?

Breathing exercises, in particular breath-based meditations, are cheaper, widely accessible, and pharmacology-free alternatives to mental health and well-being. Multiple research studies^{1, 2, 3} have shown that breathing practices can immensely impact our day-to-day lives. Not long ago, scientists have begun to investigate the effects of breathing on the human brain function.

Our brain consists of billions of neurons which talk to each other through coordinated electrical impulses, called brain waves. Each of these waves (rhythms) move with a specific frequency and has corresponding functions (see the attached infographics). Lower frequency brain waves (delta, theta and alpha) are responsible for calm and peaceful states; whereas higher frequency brain waves (beta and gamma) for alertness, memory, and greater cognitive states.

It is well known that our cognitive and emotional states modify our breathing rhythms. But what if this relationship was reciprocal? [Research](#) suggests that respiratory rhythms—by modulating the brain waves—can profoundly affect our forebrain regions (hippocampus, amygdala) involved in cognition and emotions.

What is SKY Breath Meditation and how it can affect the brain wave function?

SKY is a rhythmic breathing practice discovered by Sri Sri Ravi Shankar in 1982. Since then, it has been taught to millions of people (students, veterans, prisoners, health care workers, politicians, and professionals) across 180 countries. Compared to other meditation and breathing processes, this breathing does not require sustained mental effort, can be easily mastered, and practiced independently. The technique is taught by trained instructors in 9 hours workshops (in person/online) offered by the International Association for Human Values ([IAHV](#)) and the Art of Living Foundation ([AOLF](#)). The workshop also teaches gentle yoga postures, other breathing exercises like “Victory Breath”, “Bellow Breath”, as well as elements of emotional intelligence.

I encountered SKY breathing 12 years back when I moved to the United States to pursue my Doctoral degree. Years of daily practice helped me sail through everyday challenges such as adjusting as an immigrant to a new country, coping with graduate school pressure, losing a family member, giving birth, and taking care of my newborn. When extremely stressed, using my breath in specific rhythms helps me bypass the negative emotions, and function from a responsive rather than a reactive state. I decided to become an instructor and share these simple yet magical secrets of our breath that significantly improved my quality of life.

[Controlled voluntary breathing](#) can naturally take us to a mindfulness state by affecting brain regions that govern cognition and emotions. A [randomized controlled trial](#) involving 131 participants compared a breathing intervention—SKY (Sudarshan Kriya Yoga)—to Mindfulness-Based Stress Reduction (MBSR), Emotional Intelligence (EI), and a control group. The participants who practiced SKY breathing showed greatest improvements in mental health, stress levels, mindfulness, positive emotions, and social connectedness. Considering that our breath is more tangible and easier to follow (than other approaches), makes it an efficient tool for our mental well-being.

A recent [study](#) in 2022 found that slow controlled breathing like SKY increases the higher frequency beta brain waves resulting in effective stress management, and improved information processing. Researchers compared the beta brain wave activity during a psychological stress test within two groups—those who practiced SKY, and those who listened to relaxation music. The SKY practitioners, after 30 days practice, showed increased beta waves and improved test scores than the other group. They also demonstrated increased alertness and effective utilization of cognitive resources during a high-performance task.

A new computational [model](#) was recently proposed in which rhythmic breathing can optimize cognitive and emotional processing by regulating local and brain-wide neural communications.

Controlled breathwork generates a global brain rhythm enhancing all frequency brain waves, primarily the higher frequencies. It also boosts synchrony between the left and right brain hemispheres. These findings were published in a 2020 [study](#), where scientists observed that a single session of SKY:

- increases beta and gamma waves by 10-15%,
- increases delta, theta and alpha waves by 4-8% and,
- reduces the asymmetric pattern of the brain waves across the two hemispheres.

Above changes in the brain wave pattern can translate to improved alertness, cognition and memory, along with a sense of mental calm and emotional balance. Breathing practices can bring such effects by [conditioning](#) pulmonary vagus nerve, olfactory pressure receptors, and brain structures such as preBötzing complex.

Future Scope of Breathing Practices like SKY

Emerging evidence shows that our breath is a powerful, yet underutilized tool that connects our mind and body. Given the growing mental health crisis, there is an urgent need to utilize breath-based “therapies,” which are inexpensive, cross-culturally accepted, and can be a home-based prophylaxis for several diseases. However, their transition from culture to clinical practices is still in its embryonic stage—partly due to insufficient empirical and theoretical research. With practices like SKY, though there are no known complications or controversies, future studies involving in-depth neural and molecular mechanisms, neuroimaging, larger numbers, and diverse group of participants are warranted.

Summary about the author

Supriya Jindal is a freelance health-science writer. She has a PhD in Molecular Biology from Cleveland State University, Ohio, and has published several research articles. A certified breathwork and meditation instructor with IAHV—she loves to share mental resilience tools with community at large.

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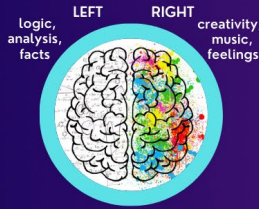
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EFFECTS OF SKY BREATHWORK ON BRAIN WAVE FUNCTIONS

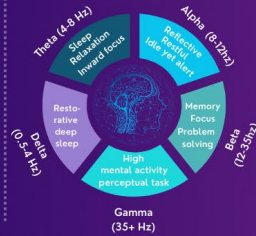
"Rhythm of breathing affects memory, emotions. Breathing is not just for oxygen; it's also linked to brain function, behaviour"

SCIENCE DAILY

Roles of Left & Right Brain Hemispheres ¹



Types & Functions of Brain Waves ^{2,3}



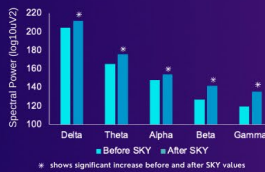
What is Sudarshan Kriya Yoga (SKY)?



SKY is an evidence based rhythmic breathing technique, introduced through workshops conducted by International Association for Human Values (IAHV) and Art of Living foundation (AOLF). It is known to reduce anxiety and stress.⁴

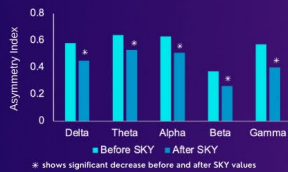
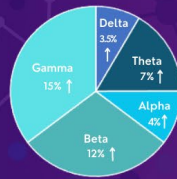
How SKY Positively Impacts Brain Functions?

Quantitative electroencephalogram (QEEG) was used for electrophysiological & functional brain imaging of SKY and non-SKY practitioners.



Practising SKY increases all frequency brain waves, enhancing—concentration & memory.⁵

SKY practitioners experience **10-15% ↑** in higher frequency brain waves, thus improved restful alertness & higher cognitive states.⁵



Practising SKY synchronizes left & right brain hemispheres—strengthening emotional control.⁵

Additional Benefits of SKY on Brain Activity



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