Review Article

Impact of Pranayama on Neuroplasticity in Psychiatric Disorders: A Narrative Review

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ABSTRACT

Background: Psychiatric disorders, such as depression, anxiety, schizophrenia, and PTSD, are associated with impaired neuroplasticity, including structural and functional brain changes. Pharmacological treatments often present adverse effects and limited efficacy in enhancing brain adaptability, highlighting the need for complementary interventions**. Objective:** This review explores the potential of pranayama, a yogic breathing technique in promoting neuroplasticity and improving outcomes in psychiatric disorders. **Methods:** A narrative review was conducted using keywords "pranayama", "neuroplasticity", and "psychiatric disorders" across databases including PubMed, PubMed Central, and Google Scholar. Inclusion criteria encompassed studies assessing the impact of pranayama on neuroplasticity using neuroimaging, neurophysiological outcomes, and emotional/cognitive functions in psychiatric populations. **Results:** Pranayama modulates neuroplastic mechanisms via multiple pathways such as enhancing neurotransmitters like GABA, dopamine, serotonin, and glutamate, increasing prefrontal cortex activation and reduces amygdala hyperactivity, improving heart rate variability, indicating enhanced parasympathetic tone and facilitating cortical-limbic connectivity, contributing to emotional regulation. Specific practices (e.g., Bhastrika, Bhramari) were found effective in reducing symptoms of anxiety, depression, and PTSD, and showed potential in improving cognitive and affective functioning in schizophrenia. **Conclusion:** Pranayama demonstrates promising effects on brain plasticity and mental health through its neurobiological and psychophysiological impact. It presents a safe, non-pharmacological approach for managing psychiatric conditions and fostering emotional resilience. However, larger randomized controlled trials and standardized protocols are needed to strengthen clinical recommendations and fully elucidate underlying neural mechanisms.

Key words: Pranayama, Neuroplasticity, Yogic breathing, Psychiatric disorders, Mental health

Mental illnesses are one of the primary causes of nonfatal disease burden in India. One in every seven Indians suffered from mental problems of varied severity. (1) Psychiatric disorders are behavioural, emotional, or cognitive dysfunctions that are not easily managed by the individual and are associated with clinically substantial distress or impairment in one or more areas, including social, occupational, and interpersonal functioning. (2) The causes of mental illnesses are often unclear, but theories suggest they result from a combination of factors across various domains and may be linked to specific regions or functions of the brain. (3)

Psychiatric disorders like depression, anxiety, bipolar disorder, schizophrenia, and PTSD significantly contribute to the global disease burden. According to the WHO, 1 in 8 people worldwide suffers from a mental disorder. In 2019, the most common conditions included depression, dementia bipolar disorder and schizophrenia/psychoses.

Access this article online

Quick response code

Received – 29th April 2025
Initial Review – 12th May 2025
Accepted – 28th June 2025

Neurodevelopmental disorders such as Attention deficit hyper active disorder (ADHD), Autistic spectrum disorder (ASD), and intellectual disabilities typically begin early in life. (4)

Psychological traits, such as personality, motivation, and attention, also play a significant role in neuroplasticity mechanisms. For instance, individuals with high levels of motivation have been shown to exhibit greater neuroplasticity than those with low levels of motivation. (5) The prevalence of psychiatric disorders varies by age, gender, location, and other factors. The prevalence of psychiatric disorders in India varies from 9.5–370 per 1,000 people. (6)

Psychiatric symptoms often emerge during the course of various central nervous system (CNS) disorders and can even precede the appearance of classic neurological signs. This overlap highlights the deep connection between brain function and mental health, as most psychiatric illnesses are now understood to involve underlying neuronal dysfunction. In

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clinical practice, the presence of psychiatric manifestations in neurological diseases emphasizes the shared neurobiological mechanisms and raises important considerations for diagnosis and treatment. (7)

Psychiatric therapy, including drugs and therapies, can have a wide range of adverse effects, from moderate and transient to severe and potentially fatal. These side effects can have an impact on a person's physical, mental, and emotional health. Many customers reported multiple adverse effects, with varying degrees of regularity. Common and annoying concerns described included sleep, mood, hunger, and weight changes. (8)

These problems have sparked interest in integrated techniques that promote brain repair and emotional resilience. Mind-body techniques are among the most widely utilised supplementary health approaches, and they are becoming increasingly popular. (9) Neuroplasticity is the brain's capacity to adapt, remodel, and reorganize itself structurally and functionally in response to new situations or damage. This process involves mechanisms such as synaptic plasticity, functional reorganization, and diaschisis, enabling the brain to better adapt to challenges and recover from injury. (10) In neurodegeneration, a key focus is understanding how surviving neurons adapt to the loss of neighbouring neurons and compensate by forming new connections or enhancing neurotransmitter delivery. (11) Neuroplasticity is a broad term encompassing the brain's ability to change, with further distinctions made between structural and functional neuroplasticity. (12) (13)

Multiple studies have documented neuroplastic changes in healthy human brains as a result of normal processes, such as learning, to harness neuroplasticity, to promote healing and recovery. Although these efforts are still in the beginning stages, there is promising evidence that the dynamic qualities of the brain may play a pivotal role in how one copes with stress and mental illness. (14) Pranayama, a key component of Yoga, has garnered special attention from the scientific community. Pranayama encompasses breath regulation techniques that involve modulating the pace of breathing, such as slowing down or pacing the breath, manipulating nostril use, employing chanting or humming sounds, and breath retention. (15)

Simple breathing exercises, such as slow and controlled breathing, are widely recognized for their ability to calm the mind and are clinically utilized to reduce excessive arousal. Rooted in the Ancient Yoga Tradition, these practices emphasize the deep, bidirectional connection between breath and mind. (16)

The impact of pranayama on neurocognitive, psychophysiological, respiratory, and biochemical functions, with a particular focus on the autonomic nervous system (ANS), has been extensively examined. (17) Some studies suggest that asymmetry in nasal airflow, where one nostril dominates breathing, may be linked to asymmetry in brain activity. Additionally, increased respiration rates are synchronized with amygdala activation during states of anxiety or fear. (18) Pranayama is believed to improve brain plasticity and modify information processing, making it a potential treatment for psychological and stress disorders or enhancing one's psychological profile. (19)

This narrative study aims to explore how pranayama, or controlled breathing techniques, influences the brain, with a focus on enhancing neuroplasticity. It investigates the effects of pranayama on neural connectivity and brain function to understand its potential role in promoting brain adaptability. Given the limited research in this area, the narrative review seeks to evaluate existing evidence and highlight the clinical relevance of pranayama in managing neurological conditions.

TYPES OF PRANAYAMA TABLE (20)

Name of the practice	Method of practice
Kapalabhati	Inhale through both the nostrils and exhale rapidly by flapping the abdomen (60-120 breaths/min)
Bhastrika (Bellow's breath)	Inhale and exhale forcefully by flapping the abdomen (100 breaths/min)
Nadishodhana/nadhishuddhi (alternate nostril breathing)	Closing the right nostril with the right thumb, inhale through the left. Close the left and exhale through the right. Inhale again through the right and exhale to the left nostril. This makes 1 round.
Surya Anuloma Viloma (right uninostril breathing)	Closing the left nostril. Inhalation and exhalation to the right nostril
Chandra Anuloma villoma (left uninostril breathing)	Closing the right nostril. Inhalation and exhalation only to the left.
Ujjai (psychic breath)	Inhalation and exhalation through partial contraction of the glottis at normal breathing pace
Bhramari (humming breath)	Inhalation done deeply with close ears, while exhaling make a soft humming sound.

METHODOLOGY

The keywords "Pranayama", "neuroplasticity" and "psychiatric disorders" were used to search for relevant citations in online databases such as Google Scholar, PubMed, and PubMed Central. The primary objective of this narrative review was to examine the potential effects of pranayama on neuroplasticity in the management of psychiatric disorders.

The inclusion criteria encompassed experimental studies, review papers, and case reports on patients with psychiatric disorders, along with outcome measures assessed through neuroimaging studies, neurophysiological studies, cognitive

function, and emotional regulation. The study considered literature from the inception of these databases up to January 2025.

Inclusion Criteria

- Studies that investigate pranayama and its impact on neuroplasticity.
- Research linking pranayama to psychiatric disorders (depression, anxiety, schizophrenia, PTSD, etc.)
- Neuroimaging studies using PET, MRI & fMRI showing structural or functional brain changes after pranayama intervention.
- Studies discussing mechanisms (e.g., vagal tone, GABA activation, prefrontal cortex activation) after pranayama intervention.

Exclusion Criteria

- Studies that focus only on general yoga without pranayama-specific effects.
- Research that discusses pranayama without mentioning brain/neuroplasticity.

Studies on only physiological outcomes after pranayama intervention (e.g., lung function, heart rate) without neural data.

DISCUSSION

How Pranayama Influences Brain Plasticity and Mental Health

Psychological disorders such as Chronic stress and depressive disorder in basic neuroscience research have been associated with impairments of neuroplasticity, such as neuronal atrophy and synaptic loss in the medial prefrontal cortex (mPFC) and hippocampus. (21)

Corticotropin releasing hormone (CRH) induced release of adrenocorticotropic hormone (ACTH) in stress alters neural network function by modifying its building blocks and integrative properties, leading to behavioural or emotional changes. Stress-induced neuroplasticity, driven by these processes, significantly influences brain function and contributes to functional alterations in mental disorders, playing a critical role in nearly all psychiatric conditions. (22)

In post-traumatic stress disorder (PTSD), elevated stress leads to excessive glucocorticoid release, which contributes to the loss of pyramidal cells in the hippocampus a postmortem finding also observed in depression. (23, 24) In schizophrenia, reduced dendritic spine density is observed in regions such as the dorsolateral prefrontal cortex (DLPFC), accompanied by a decline in cortical dopaminergic (DA) signalling. These changes are believed to underlie some of the cognitive and functional impairments associated with the disorder. (25)

Glutamate, the primary excitatory neurotransmitter in the brain, plays a crucial role in neuroplasticity. It is essential for processes like long-term potentiation (LTP), spine density regulation, and synaptic reorganization, which influence behaviour and adaptive potential. Dysregulation of glutamate-mediated neuroplasticity is linked to impaired neural function and may contribute to mood-related disorders. (26)

Schizophrenia and other psychotic disorders are now recognized as conditions rooted in the dysfunction of brain neural circuits. These disorders involve distortions in representational and computational processes that arise from neuronal architecture and are supported by neural oscillatory coupling. This understanding highlights the importance of disrupted neural communication and integration in the pathology of these conditions. (27)

The mechanism can be understood by examining two distinct aspects.

Effects of Pranayama on Neuroplasticity

A. Neurobiological mechanisms of Pranayama

Ancient Indian texts on Yoga describe, “As the breath moves, so does the mind, and mind ceases to move as the breath is stopped.” Thus, evaluating the impact of yogic breathing on neurocognitive abilities has sought special attention from the scientific community. An early review indicates that yogic breathing practices could influence the brain activity in different. (28, 29) According to preliminary studies, pranayama can affect habitual neuronal firing patterns, notably in brain regions related with emotional processing and autonomic regulation. For example, consistent practice of Bhastrika pranayama has been linked to lower activity in the amygdala, a region associated with anxiety and stress responses, and enhanced connectivity in prefrontal regions involved in cognitive control and emotional regulation. (30, 31)

These findings suggest that pranayama may facilitate neuroplastic changes, offering potential benefits for neurorehabilitation and mental health.

1. Neurotransmitter Modulation

A study found that practicing yogic pranayama regularly for six weeks helped paramedical students feel less anxious and improved their overall well-being. The results suggest that incorporating pranayama into medical and paramedical education could be beneficial. This practice was linked to higher levels of GABA in the brain, a neurotransmitter often found in lower amounts in people with anxiety and mood disorders (32). Additionally, previous research on Bhramari pranayama indicates that it influences key neurotransmitters like epinephrine, serotonin, dopamine, and glutamate through the release of nitric oxide. This mechanism may help reduce depression, anxiety, and stress while promoting emotional well-being. Studies also show that practicing Bhramari pranayama online can significantly lower stress levels ($p<0.05$) and enhance breath-holding capacity and attention

($p<0.05$), making it a useful tool for improving mental health and cognitive function in young adults. (33)

2. Autonomic Nervous System & Vagus Nerve Activation

A study examining the effects of pranayama on heart rate variability (HRV) in 25 participants found a significant increase in the root mean square of successive differences (RMSSD) between RR intervals, a key measure of HRV. This increase was observed during five different breathing techniques, particularly with paced breathing, deep breathing, and Sheetali/Sheetkari pranayama, which highlighted the dominance of the parasympathetic nervous system. Pranayama, as a controlled yogic breathing practice, is well known for enhancing parasympathetic activity and improving HRV. This suggests a stronger parasympathetic influence on heart function, promoting relaxation and reducing stress levels. (34)

3. Neuroplasticity & Brain Structures Affected

Pranayama practice has been shown to significantly influence the prefrontal cortex, a brain region responsible for decision-making, attention, and emotional regulation. By increasing blood flow and oxygenation to this area, pranayama may enhance focus, reduce anxiety, and improve cognitive performance. Studies examining specific aspects of pranayama, such as breath retention and prolonged exhalation, provide insights into its neural mechanisms. These effects can be better understood by analysing behavioural and structural changes through intensive training. Advanced technologies such as fMRI for neuroplasticity analysis, respiratory plethysmography combined with EEG for real-time monitoring of brain oscillations and breathing patterns, and ECG for assessing heart rate variability can further elucidate these mechanisms. Blinded, randomized controlled trials using anxiety and interception scales can help validate these findings. (18)

A key study revealed that nasal breathing generates synchronized oscillations in the piriform cortex, amygdala, and hippocampus, while mouth breathing does not produce the same pattern. This lack of synchronization has been linked to sleep disturbances and attention deficit hyperactivity disorder (ADHD). Additionally, an increased breathing rate has been found to synchronize with amygdala activation during anxiety or fear, influencing neuronal activity in the neocortex and directly linking respiration to cognitive processes. Another recent study suggests that conscious breathing may enhance emotional regulation by strengthening the connection between the prefrontal cortex and the limbic system. (35, 36)

Bhastrika pranayama, when practiced with kumbhaka (breath retention), is a powerful technique that significantly impacts the nervous system. Regular practice can reshape habitual neuronal firing patterns, particularly in the reticular activating system and hypothalamus. This shift may lead to profound changes in emotional responses, including the regulation of deep-seated fears, such as the fear of death. As a result, this practice has the potential to influence personality traits at a fundamental level, offering significant psychological and neurological benefits. (20)

B. Pranayama in Psychiatric Disorders

1. GAD Disorders & Pranayama Breathing practice

Panic disorder (PD) profoundly disrupts daily life with sudden, intense episodes of fear. While conventional treatments like cognitive-behavioural therapy (CBT) and mindfulness-based interventions (MBIs) have shown efficacy, integrating yoga—particularly pranayama—offers additional benefits. Pranayama techniques such as Bhastrika (Bellows breath), Nadishuddhi (Alternate nostril breathing), Shitali (Cooling breath), and Bhramari (Humming bee breath) influence key neurobiological mechanisms associated with anxiety regulation. These practices enhance parasympathetic activity, modulate neurotransmitters like serotonin, dopamine, and GABA, and promote nitric oxide release, which improves neurovascular function and emotional stability. Findings from a randomized controlled trial (RCT) revealed significant improvements in anxiety and quality of life (QOL) among individuals practicing yoga, reinforcing its potential as a complementary therapy for PD. These results align with previous research supporting the role of breathwork in autonomic regulation, neuroplasticity, and emotional resilience. (37)

Breathing exercise in various conditions has been reported to improve quality of life, reduce mental health problems such as stress, anxiety & depression. Practice of Bhramari Pranayama for 5-10 min continuously induce subjective feelings of mind refreshment and blissfulness and sometimes the subjects are believed to go to even meditative state. The lockdown and social distancing have led to challenges like feeling of stress, anxiety, fear, loneliness at times, depression, irritability, insomnia, confusion, anger, frustration, and boredom. Bhramari Pranayama intervention is an effective technique to manage the depression, anxiety and stress, during COVID-19 home isolation. The findings further support that Bhramari Pranayama intervention helped to improve the quality of sleep and general wellbeing during the treatment period. Stress may aggravate the underlying autoimmunity, whereas yoga helps in reducing sympathetic arousal and the activity of the hypothalamus pituitary and renal axis, which in turn reduces stress and anxiety levels. (38)

4 Weeks of Bhramari pranayama significantly reduce the levels of anxiety and negative affect, and that these changes are associated with the modulation of activity and connectivity in brain areas involved in emotion processing, attention, and awareness suggesting that pranayama significantly decreased states of anxiety and negative affect. The practice of pranayama also modulated the activity of brain regions

involved in emotional processing, particularly the amygdala, anterior cingulate, anterior insula, and prefrontal cortex. Resting-state functional MRI (fMRI) showed significantly reduced functional connectivity involving the anterior insula and lateral portions of the prefrontal cortex. (31)

In a study by Priyadarshini et al. (2017), sixty adults with unipolar depression were selected to practice pranayama for 45 minutes twice a week for one and a half months with a total of 12 sessions. The results of comparison of the experimental group's preintervention, post-intervention and follow-up scores showed that Pranayama practice had a significant effect on participants' depression and resilience levels. (39)

A systematic review study on Bhramari Pranayama by Kuppusamy et al. (2018) included a total six studies. In their review study, two studies done on cold pressure tests, one on EEG changes, one on heart rate and BP, one on inhibitory response and one on tinnitus conditions. The study concluded that Bhramari Pranayama has a beneficial effect on stress, anxiety, autonomic nervous system and respiratory system. (40)

A randomized control trial (RCT) study examined the effect of Bhastrika Pranayama on thirty healthy adults by dividing them into the Pranayama Group and Non pranayama Control Group. After one month of pranayama practice, the subjects showed a marked reduction in anxiety and negative impact by regulating the activity of brain regions related to emotional mood. (31)

A review article discusses the probable use of Bhramari in Generalised Anxiety Disorder (GAD). Since GAD is one of the most common mental disorders, it is hypothesised that Bhramari acts good against GAD too. It has been suggested that the increase of parasympathetic activity (associated with expiration time) reduces the release of hormones associated with stress, and enhances GABA inhibition from the prefrontal cortex and insula to the amygdala, reducing its activity, and the psychological and somatic symptoms associated with stress Hence, it can be concluded that it would be beneficial to conduct larger studies on GAD patients to ascertain the efficacy of Bhramari in their population. (41)

2. Depression & Pranayama

Depression is a common mental disorder with a rising prevalence in India, often accompanied by cognitive impairment. Pharmacological treatments primarily provide symptomatic relief but are associated with adverse effects and offer little to no improvement in cognitive function or cerebral hemodynamics. A study investigating cerebral hemodynamics in a patient with depression found that practicing Bhastrika Pranayama for 10 minutes led to an increase in bilateral oxygenated hemoglobin (OxyHb) levels during and immediately after the practice, particularly in the prefrontal cortex. These findings suggest that Bhastrika Pranayama may have an immediate positive impact on cerebral hemodynamics in individuals with depression. Improved cerebral hemodynamics have been linked to enhanced neurogenesis and angiogenesis, as adequate blood flow and oxygenation are essential for neuronal function and plasticity. (42)

3. Schizophrenia & Pranayama

A functional near-infrared spectroscopy (fNIRS) study examined frontal hemodynamic responses to the high-frequency yogic breathing technique, Kapalabhati (KB), in patients with schizophrenia. The study compared 18 patients with schizophrenia (14 males, 4 females) to 18 age-, gender-, and education-matched healthy controls. Results revealed significantly reduced bilateral prefrontal activation in schizophrenia patients during KB, as indicated by lower oxygenated hemoglobin (OxyHb) levels in both hemispheres (right OxyHb, $p = 0.01$; left OxyHb, $p = 0.03$) and reduced total hemoglobin (right total Hb, $p = 0.03$; left total Hb, $p = 0.04$) compared to healthy controls.

This hypofrontality suggests impaired neurovascular coupling and reduced neuroplasticity in schizophrenia, as adequate cerebral oxygenation and blood flow are essential for synaptic remodelling, neurogenesis, and functional connectivity. Yogic breathing techniques like KB may hold therapeutic potential by stimulating cerebral perfusion and enhancing neuroplastic mechanisms, which could contribute to cognitive and emotional regulation in schizophrenia. (43)

In a study conducted at National Institute of Mental Health and Neuro Science (NIMHANS) by Shivarama Varambally et al. (2019), a validated 60-minute yoga module was developed and administered to individuals with schizophrenia. The module included pranayama (breathing techniques) as a core component of the intervention. The study hypothesized that yoga, including pranayama, would improve psychopathology, enhance emotion processing, and positively influence biomarkers such as serum brain-derived neurotrophic factor (BDNF), plasma oxytocin levels, and cerebral activation patterns in brain regions associated with schizophrenia. (44)

4. PTSD & Pranayama

A study examined the effects of pranayama (meditative yoga breathing and breath-holding techniques) as a complementary intervention for PTSD patients undergoing Trauma-Focused Cognitive Behavioural Therapy (TF-CBT). Seventy-four patients were randomized into two groups: pranayama-assisted TF-CBT or TF-CBT alone. While intention-to-treat (ITT) analyses showed no significant differences in PTSD severity or most secondary outcomes, per-protocol (PP) analyses revealed that patients without adverse events (AEs) during pranayama had lower PTSD severity and higher mental quality of life compared to controls. However, patients who experienced AEs during pranayama reported worse PTSD symptoms. The study concluded that pranayama may benefit

PTSD patients without concurrent somatoform disorders, but findings are preliminary and require replication. (45)

Most patients experienced mild hypoxia during pranayama, which increased heart rate variability (HRV) and improved ANS adaptability. This shift occurred during sympathetic and ventral vagal activation, creating a state of relaxation and safety. By focusing on breath retention, patients strengthened their central executive network, which helped downregulate amygdala activation and reduce sympathetic arousal, even in the presence of hypoxia. (46)

In summary, pranayama modulates PTSD symptoms by stabilizing ANS reflexes, enhancing cortical connectivity, and downregulating amygdala activity. Regular practice of pranayama activates the cingulated cortex, medial prefrontal cortex and putamen structure those are associated with conscious attention and plays an important role in developing greater mental capabilities and sustained attention. The conscious attention develops the capacity for deep insight, proper interpretation of emotive stimuli and correct observation also (Ravindra. 2012). Practice of pranayama restrained the arousal of limbic system (seat of emotion) and enhanced the arousal of higher cortical region of the brain. Practice of pranayama brought about deep relaxation, justified, mature and stable emotion along with the reasoning consciousness by eradicating the irrational impulses and other mental aberrations. In this way, the objective of the study was definitely supported by results of the study.

Studies confirmed that yoga practices greatly influence and modify the activity of amygdale and right anterior insula; the main neural structures associated with these functions. When an individual practices pranayama, one's breathing process becomes slow, deep and rhythmic. As a result of these, one feel deep relaxation as the excitation of sympathetic nervous system and HPA axis is curtailed, functions of all the visceral organs slowed down, arousal of limbic system is minimized. (47)

LIMITATIONS

The limitations of this review include a scarcity of large-scale randomized controlled trials (RCTs) and a limited number of neuroimaging studies specifically focused on pranayama. Additionally, there is a need for standardized pranayama protocols in psychiatric research to ensure consistency and reproducibility. Furthermore, the field lacks recent advancements and comprehensive studies exploring the neural changes associated with breathing regulation, highlighting a significant gap in understanding the full scope of pranayama's impact on brain function.

CONCLUSION

According to theoretical theories, the vagus nerve mediates the psychobiological mechanism via which pranayama works. This mechanism is thought to involve connections between the prefrontal brain, limbic regions, thalamus, and peripheral sensory organs. (33)

Pranayama, a yogic breathing practice, has demonstrated significant potential in influencing brain plasticity and mental health. Research indicates that pranayama can modulate neurobiological mechanisms, including neurotransmitter levels (e.g., GABA, serotonin, dopamine, and glutamate), enhance parasympathetic tone, and improve heart rate variability (HRV), leading to reduced stress and anxiety. These practices have been shown to positively impact brain structures such as the prefrontal cortex, amygdala, and hippocampus, which are critical for emotional regulation, cognitive function, and neuroplasticity.

Pranayama has been particularly effective in addressing psychiatric disorders such as generalized anxiety disorder (GAD), depression, schizophrenia, and post-traumatic stress disorder (PTSD). For instance, it reduces amygdala hyperactivity, enhances prefrontal cortex connectivity, and improves cerebral hemodynamics, which are often impaired in these conditions. Studies also suggest that pranayama can downregulate the hypothalamic-pituitary-adrenal (HPA) axis, reduce sympathetic arousal, and promote emotional resilience.

In summary, pranayama offers a non-pharmacological, complementary approach to mental health by fostering neuroplastic changes, improving emotional regulation, and enhancing overall well-being. Further research, including larger randomized controlled trials and advanced neuroimaging studies, is needed to fully elucidate its mechanisms and therapeutic potential across various mental health conditions.

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How to cite this article: Salam M, Archana K, Shetty S, Shetty V, Vinay Kumar T. Impact of Pranayama on Neuroplasticity in Psychiatric Disorders: A Narrative Review. Indian J Integr Med. 2025; Online First.
Funding: None; *Conflicts of Interest: None Stated*