Breathing Through the Ringing:

How I Use Yogic Breathing to Manage Tinnitus and Regulate Body Temperature

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Introduction: Living with the Ringing

I am a Vietnam veteran, a Regents Professor Emeritus at New Mexico State University, a Holy Fire® Reiki Master, and a rancher in Caballo, New Mexico. I am also someone who lives with tinnitus. For many veterans, tinnitus is a constant companion — a ringing, buzzing, or hissing that never fully goes quiet. After decades of exposure to the sounds of war and a lifetime of academic and spiritual work, I carry that inner noise with me into every morning. It moves from left to right ear, buzzing, and sometimes both, or is just in front of me, or I am surrounded by a thousand insects chattering at once.

I have been practicing pranayama breathing, and sometimes when I am asleep for hours, and I wake up, the insect swarm has left me. Last night I woke at 3:30 AM, and the buzzing was quiet.

My spiritual path as Arihanta — a name given to me by Gurudev Shree Chitrabhanu, meaning "you have no enemies, everyone is your friend" — shapes how I approach the body. In Jain philosophy, prana is not merely breath; it is the life force, the animating energy that connects each of us to the universe. When I breathe with intention, I am not merely exercising a muscle. I am working with something subtle, something that the ancient yogis understood long before modern neuroscience arrived to confirm it.

I have learned to accept tinnitus as my friend and teacher. I remind myself, I am Arihanta, and I have no enemies. When the buzzing sounds like a swarm of bees, I observe what the stressors I am feeling are. Am I working to hard? Are there too many things on my plate? Am I spinning in too many directions, instead of just one life purpose? Do I need to slow down, rest, relax, and get into my breathing discipline? Answer ‘Yes’ to all these.

What I have found, after years of practicing pranayama — the ancient yogic science of breath regulation — is that I can do something about the buzzing swarm around my head. Not cure it, but quiet it, soften its grip, and reduce the stress and anxiety that cause it to flare up.

This essay is my account of the specific breathing practices I use, the science that explains why they work, and two additional practices I have integrated into my daily life for thermoregulation: warming the body when I am cold and cooling the body when I am too hot. I offer this not as medical advice but as a practitioner's testimony, grounded in both lived experience on my ranch in New Mexico and in peer-reviewed science.

Section 1: Bhramari Pranayama — Humming the Ringing Away

The Practice

Of all the pranayama techniques I use for tinnitus, Bhramari — the Humming Bee Breath — is the single most effective. Its name comes from the Sanskrit word for bee, and the sound you produce does indeed resemble a steady, resonant buzzing. The practice is deceptively simple, but the physiology behind it is anything but.

Here is how I do it. I sit in a comfortable cross-legged position — or on a chair if my knees are protesting — with my spine upright. I close my eyes gently. Then I bring my hands into ***Shanmukhi Mudra***: thumbs pressing gently over the ear canals, index fingers resting lightly on the forehead, middle fingers over closed eyelids, ring fingers above my upper lip, and little fingers below. Some teachers call this the ***six-gates seal***.

With my ears sealed and eyes softly closed, I take a long, slow inhalation through the nose, filling the lungs from the belly upward. On the exhale, with the mouth closed, I produce a deep, steady hum — not from the throat with force, but softly, so that I feel the resonance vibrating through my skull, my sinuses, my jaw, and the crown of my head. I hold this for the full length of the exhale. I add alternate nostril breathing to this. I typically practice seven to ten rounds in the morning, and another five to seven rounds in the evening if the tinnitus is particularly active. The whole session takes between five and ten minutes.

Humming helps manage tinnitus through a combination of physiological, neurological, and acoustic mechanisms that address both the physical roots and the emotional perception of the ringing.

Physiological and Chemical Mechanisms

- **Nitric Oxide (NO) Release:** Humming with the mouth closed creates resonance in the sinuses, which triggers a **15-fold increase in the production of nasal nitric oxide**

compared to quiet breathing. Nitric oxide acts as a potent **vasodilator**, relaxing blood vessel walls and improving circulation to the cochlea and inner ear—tissues that are often poorly perfused in those with tinnitus.
- **Enhanced Oxygenation:** The nitric oxide pumped from the sinuses is inhaled into the lungs, where it improves the efficiency of oxygen transfer into the blood. This can result in increased mental clarity and alertness.

Neurological and Autonomic Regulation

- **Vagus Nerve Stimulation:** Vocal cord vibrations during humming provide direct **mechanical stimulation to the vagus nerve**. This stimulation shifts the autonomic nervous system away from "fight-or-flight" (sympathetic) arousal and toward **parasympathetic dominance** (rest-and-digest).
- **Optimized Breathing Ratios:** Because humming can only occur during exhalation, it naturally enforces an **exhale-to-inhale ratio of approximately 3:1 to 4:1**. This extended exhalation activates the baroreceptor reflex, which further signals the nervous system to enter a state of deep calm.
- **Reducing Emotional Amplification:** By inducing a state of neurological calm, humming reduces the anxiety and stress that often amplify the perceived intensity of tinnitus, helping to break the feedback loop where stress worsens the ringing and the ringing increases stress.

Acoustic and Structural Mechanisms

- **Self-Generated Masking:** The resonant buzzing of a hum (often called **Bhramari Pranayama** or Humming Bee Breath) provides an internal masking sound that can temporarily override or soften the perceived ringing.
- **Bone Conduction:** Vibration from humming propagates through the bones of the skull at 3,000 to 4,000 meters per second—**9 to 12 times faster than sound travels through air**. This delivers full-spectrum, continuous vibration directly to the cochlea and the entire cranial vault.
- **Sinus Ventilation:** The acoustic pressure created by humming physically ventilates the sinus cavities, flushing out stagnant air and potentially reducing the "inner turbulence" that contributes to the attention given to tinnitus.

Clinical Significance

Research has identified a **strong causal relationship** between regular humming practices and a reduction in tinnitus-related handicap. One systematic review noted substantial clinical significance in these results, while other trials found that structured breathing exercises involving extended exhales significantly lowered tinnitus handicap scores over a six-week period. Practitioners often find that while humming may not "cure" the condition, it allows them to become the **master of the sound rather than its servant**, finding a space of presence beneath the ringing.

One important nuance I have learned through practice: the sound must stay inside. If I let it escape outward through open lips or a loose throat, the resonance collapses, the sinuses do not vibrate, and the biological machinery that makes Bhramari so effective simply does not engage. The vibration must build inside the cranial vault.

The Science

Modern research has confirmed what the ancient yogis knew intuitively. A 2023 systematic review published in the Indian Journal of Otology examined the clinical evidence on Bhramari Pranayama as a treatment for tinnitus, identifying a strong causal relationship between the practice and reduced tinnitus-related handicap, with effect sizes of 0.86 and 0.92 in the studies reviewed — figures that represent substantial clinical significance (Gunjawate et al., 2023). A broader 2024 comprehensive literature review of 46 experimental studies in the Indian Journal of Physiology and Pharmacology concluded that Bhramari has positive effects on psychological, cardiovascular, and pulmonary health, and specifically helps tinnitus and hypertension sufferers reduce their symptoms (Chetry et al., 2024). Across these studies, Bhramari was associated with increased parasympathetic activity, lower blood pressure, reduced anxiety and depression, improved sleep quality, and reduced irritability — all of which are directly relevant to my tinnitus experience.

The physiological mechanism is elegant. When I hum with my mouth closed and the sound resonates in my sinuses, the vibration of the nasal cavity triggers the release of nitric oxide (NO). A landmark 2002 study by Weitzberg and Lundberg, published in the American Journal of Respiratory and Critical Care Medicine, demonstrated that humming increases nasal nitric oxide production by approximately 15-fold compared to quiet exhalation (Weitzberg & Lundberg, 2002). Nitric oxide is a potent vasodilator: it relaxes the smooth muscle walls of blood vessels, improving circulation to the cochlea and inner ear — tissues that are often poorly perfused in tinnitus sufferers. Additionally, the vocal fold vibration during humming directly stimulates the recurrent laryngeal branch of the vagus nerve, shifting the autonomic nervous system away from sympathetic arousal (fight-or-flight) and toward parasympathetic dominance (rest-and-digest). A 2023 Holter-based study by Trivedi et al. published in Cureus found that Bhramari produced a lower stress index than physical activity, emotional stress, and even sleep, as measured by heart rate variability parameters — a remarkable result for something I can do sitting quietly in my ranch house at sunrise.

The tinnitus relief I experience from Bhramari likely operates through three converging mechanisms identified by researchers: first, the humming provides a self-generated masking sound that temporarily overrides the perceived ringing; second, the nitric oxide release improves cochlear blood flow, addressing one of the physiological roots of tinnitus; and third, the vagal activation induces a neurological state of calm that reduces the emotional amplification of the sound (Pandey, 2011; Rajasekaran et al., 2023). In Jain terms, I think of it as reducing the karmic agitation — the inner turbulence — that gives the ringing its power over my attention.

Section 2: Nadi Shodhana — Balancing the Channels

The Practice

Nadi Shodhana, often translated as Alternate Nostril Breathing or Channel Purification, is the second pillar of my tinnitus practice. In yogic anatomy, the nadis are subtle energy channels through which prana flows. Ida nadi flows along the left side of the spine and is associated with lunar, cooling, parasympathetic energy. Pingala nadi flows along the right and is associated with solar, heating, and sympathetic energy. Tinnitus, like so many stress-related conditions, often reflects an overactivation of pingala — an excess of heat and agitation in the system. Nadi Shodhana works to restore balance.

My practice is as follows. I sit comfortably, spine upright. I bring my right hand to Vishnu Mudra: index and middle fingers folded toward the palm, thumb and ring finger extended. I close the right nostril with my right thumb and inhale slowly and completely through the left nostril for a count of four. I then close both nostrils with thumb and ring finger simultaneously, holding the breath for a count of two to four seconds. I release the right nostril and exhale slowly through the right for a count of eight — twice the length of the inhale. I pause briefly at the bottom of the exhale. Then I inhale through the right nostril, hold, and exhale through the left. That is one complete cycle. I practice five to eight cycles per session, usually after Bhramari in the morning, and again at midday if I have been sitting at my desk for several hours.

I also practice a simplified version that my teacher calls Chandra Bhedana — Moon Piercing Breath — which involves breathing in only through the left nostril and out through the right. This activates the ida nadi and its cooling, calming properties, and I use it specifically when the tinnitus spikes in conjunction with stress or anxiety.

The Science

The scientific literature on Nadi Shodhana documents its effects on autonomic regulation with growing consistency. Research has shown that alternate nostril breathing reduces heart rate, lowers blood pressure, and shifts autonomic tone toward parasympathetic dominance — the exact neurological state that reduces tinnitus severity. Telles and colleagues have documented that slow pranayama, including Nadi Shodhana, significantly enhances vagal activity and reduces sympathetic reactivity (Telles et al., 2013). Because tinnitus is strongly correlated with sympathetic nervous system overactivation and elevated cortisol — a feedback loop in which stress worsens the ringing and the ringing worsens the stress — any practice that reliably interrupts that cycle has direct therapeutic value. For me, Nadi Shodhana is that interruption.

There is also a structural reason why left-nostril-dominant breathing works particularly well for calming the nervous system. Research in lateralized nasal airflow has found that left nostril breathing preferentially activates the right hemisphere of the brain, which is associated with creativity, spatial awareness, and parasympathetic function. This may explain why I feel a distinctive mental quieting when I practice Chandra Bhedana — not just relaxation, but a gentle shift in the quality of awareness itself, away from the analytical left-brain chatter that can amplify my focus on the tinnitus.

Section 3: 4-7-8 Breathing — The Long Exhale

The Practice

The 4-7-8 technique is the most structured of my tinnitus practices and the one I most often recommend to colleagues in our Tuesday Enthinkment Circle who are dealing with stress-related symptoms. Developed in its modern Western form by integrative medicine physician Andrew Weil and rooted in the extended-exhale practices of classical pranayama, 4-7-8 breathing operates on a simple but powerful principle: when the exhale is significantly longer than the inhale, the parasympathetic nervous system dominates.

I practice it this way. I sit or lie comfortably. I exhale completely through my mouth with a quiet whoosh sound, emptying the lungs fully. I close my mouth and inhale quietly through the nose for a slow count of four. I hold my breath for a count of seven. I then exhale completely through the mouth, again with a soft whoosh, for a count of eight. That is one breath. I typically practice four cycles when I first lie down at night, and another four if I wake during the night with the tinnitus particularly active. The extended hold — seven counts — is where the real autonomic shift happens. During the breath hold, particularly with the addition of Ashvini Mudra (a gentle pelvic floor contraction held during the retention), the nervous system undergoes a sympathetic spike followed by a rapid reset into parasympathetic mode — what some yogic teachers describe as the switch that flips the nervous system into deep calm.

The Science

A Turkish clinical trial published in 2025 and indexed in PubMed (NCT06360731) provided direct clinical evidence for the 4-7-8 technique specifically in tinnitus management. The randomized controlled trial found that the 4-7-8 breathing exercise significantly reduced tinnitus handicap scores over a six-week program, with all questionnaire and visual analogue scale scores showing significant decreases in the experimental group compared to controls. The researchers concluded that it could serve as a simple, effective, and supportive therapy in the clinical management of tinnitus (as referenced in PMC12895279). The mechanism is straightforward: the extended exhale activates the vagus nerve more powerfully than the inhale, and the breath hold after inhale creates a transient increase in carbon dioxide, which has vasodilatory effects on cerebral and cochlear blood vessels. Improved cochlear circulation is a key pathway to tinnitus relief.

The connection between CO2 tolerance and overall physiological health is something I take seriously in my practice. Slow pranayama breathing — precisely the kind used in 4-7-8 — improves CO2 tolerance over time, which allows greater tissue oxygenation at rest. This is the insight captured in the notes I made when I first began studying pranayama: learning to breathe more slowly and hold the breath is not about deprivation but about recalibrating the body's oxygen-CO2 balance to a healthier setpoint.

Section 4: Diaphragmatic Belly Breathing — The Foundation

The Practice

Beneath all the more structured techniques lies diaphragmatic breathing — belly breathing — which I practice as the foundation of every session and as a standalone intervention whenever I notice shallow, stress-driven chest breathing taking over. As a Vietnam veteran, I know from hard experience what chronic sympathetic activation feels like in the body, and one of its most

reliable signatures is shallow, fast breathing from the upper chest rather than the slow, deep movement of the diaphragm.

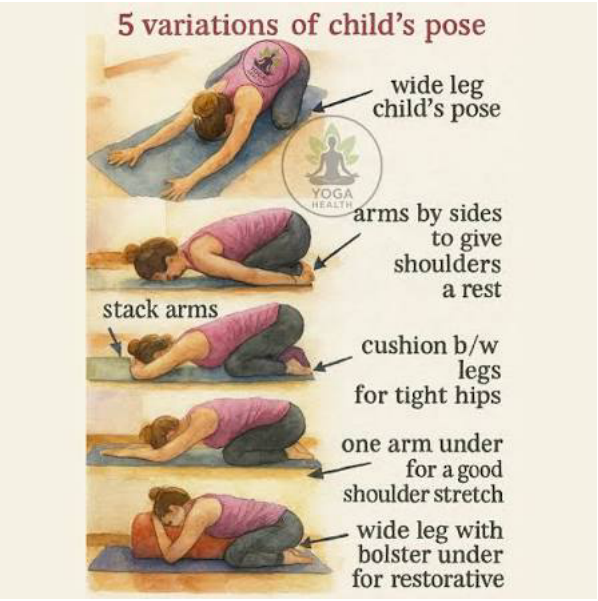
My practice is simple. I lie on my back or sit upright. I place my right hand on my belly, below the navel, and my left hand on my chest. I breathe in through the nose slowly enough that only my right hand rises; my chest remains relatively still. I breathe out through the nose — or sometimes through pursed lips — with an exhale that is twice the length of the inhale. I aim for a breathing rate of four to six breaths per minute, roughly five to six seconds per inhale and seven to eight seconds per exhale. I hold this practice for five minutes at a time, several times daily.

The subtlest form of this practice is what my notes describe as the ideal: slow, silent, barely perceptible breath. A breath so gentle that an observer would barely know you are breathing. This is the breath of deep meditation — the breath that Vipassana and many contemplative traditions regard as the doorway to the witness state, the deeper layer of consciousness beneath the ego's chatter.

The Science

Slow diaphragmatic breathing at frequencies below six breaths per minute has been documented to synchronize respiratory and cardiovascular oscillations in a state called cardiorespiratory coherence, associated with maximum heart rate variability and optimal vagal tone (Lehrer & Gevirtz, 2014). It lowers blood pressure, reduces cortisol, and activates the prefrontal cortex — the brain region responsible for attentional control. For tinnitus sufferers, who often report that attention and anxiety are the primary drivers of tinnitus severity, this attentional regulation is as important as the physiological effects. When I am breathing at four breaths per minute, my mind is too occupied with the breath to be fully occupied with the ringing.

Section 5: Child's Pose with Breath — Embodied Rest



The Practice

I incorporate Child's Pose, or Balasana, not as a breathing technique per se but as a posture that creates the optimal physical conditions for deep, slow, restorative breathing. On my ranch in Caballo, after working with Fancy or Clyde or after a long morning at the desk, Child's Pose is my reset. I come to my hands and knees on a mat, bring my big toes together, and sit back toward my heels as far as my knees allow — I use a folded blanket under my hips when they are tight. I fold forward, resting my forehead on the mat or on a block. My arms extend forward, palms down. In this position, I breathe slowly and deeply, focusing particularly on allowing the back body to expand with each inhale. I hold the pose for eight to twelve breaths, using a slightly extended exhale throughout.

The pose combines three therapeutic elements: the gentle inversion of the head below the heart improves venous return and reduces blood pressure; the forward fold releases tension in the neck, shoulders, and jaw — all regions where tinnitus-related muscular tension accumulates; and the restorative position activates the parasympathetic nervous system by virtue of its stillness and the soft pressure of the belly against the thighs.

Section 6: Warming the Body — Practices for When I Am Too Cold

The Practice

New Mexico winters can be sharp, and on the ranch, cold settles in bones quickly. Over the years I have developed a warming breathwork sequence that I use when I need to raise my core temperature, increase circulation, or simply shake off the heavy cold of early morning. The primary practice is Bhastrika Pranayama — Bellows Breath.

I sit in a comfortable seated position, spine erect. I begin with a series of rapid, forceful inhalations and exhalations through the nose, pumping the diaphragm actively — not the chest — at a rate of roughly one breath per second. Each inhale is full and active; each exhale is equally active and complete. I start with twenty rapid breaths, then pause with a full inhale retained for five to ten seconds, then exhale slowly. I repeat two or three rounds. The internal heat generated is noticeable within the first ten to fifteen breaths; my face warms, circulation increases to the extremities, and the morning fog in the mind clears rapidly.

My second warming practice draws from the Tibetan tradition of Tummo — Inner Fire. I use a simplified Tummo sequence rather than the full monastic practice. I sit with spine upright, eyes closed and begin by visualizing a small flame at the navel center — what yogic anatomy calls the manipura chakra. With each inhale, I visualize the flame growing, spreading warmth upward through the torso. I use forceful, pursed-lip exhalations that feel like I am pushing air through a small straw, combined with a gentle Uddiyana Bandha — drawing the belly in and up after the exhale. After five to eight of these active cycles, I take a long, slow retention with the breath fully in, hold the internal heat visualization, then release slowly. Three to five rounds of this practice create significant internal warmth.

I also use Surya Bhedana — Right Nostril Breathing — as a gentler warming practice. Closing the left nostril with my ring finger, I inhale slowly and completely through the right nostril only, then exhale through the left. The right nostril is associated with the solar pingala nadi — warming, activating energy. Even ten rounds of Surya Bhedana creates a noticeable increase in alertness and body warmth without the intensity of Bhastrika.

The Science

Research by Herbert Benson and colleagues at Harvard Medical School documented the remarkable thermoregulatory capacity of Tummo meditators, who were able to raise peripheral skin temperature by up to 8-9 degrees Celsius during meditation — an effect attributed to the combination of focused visualization and specific breathing patterns that accelerate metabolic activity (Benson et al., 1982). More recently, a 2020 study in the journal Frontiers in Physiology reviewed the mechanisms by which rapid pranayama techniques like Bhastrika increase metabolic rate, sympathetic tone, and thermogenesis through elevated oxygen consumption and increased cardiac output (Saoji et al., 2019). Surya Bhedana has been documented in a controlled trial to produce measurable increases in oxygen consumption and metabolic rate compared to normal breathing, confirming its warming and energizing properties (as reviewed in PMC7336938). These practices work by stoking the body's internal metabolic fire — quite literally burning fuel faster to generate heat.

Section 7: Cooling the Body — Practices for When I Am Too Hot

The Practice

Southern New Mexico summers are brutal. Temperatures reach into the high nineties and above, and working outdoors with the horses or the land in that heat demands a reliable way to cool down quickly. The yogic tradition has two exquisite cooling practices for exactly this situation: Sitali and Sitkari.

Sitali Pranayama requires the ability to curl the tongue into a tube — a genetic trait not everyone has. When I can do it, this is my preferred summer cooling practice. I curl the sides of my tongue upward to form a channel, extend the tongue slightly from the lips, and inhale slowly and deeply through this tongue-straw. The incoming air is cooled as it passes over the moist tongue surface, much like a natural air conditioner. I then bring the tongue in, close the mouth, and exhale slowly through both nostrils. I practice ten to fifteen rounds, then sit quietly for a minute. The cooling effect is immediate and genuine.

For days when the tongue-curl is less cooperative — which happens — I use Sitkari, the Hissing Teeth Breath. I bring my upper and lower teeth gently together, part my lips slightly, and inhale through the gap between the teeth with a soft hissing sound. The cooling mechanism is similar to Sitali: moisture on the tongue and inner lips cools the incoming air before it enters the lungs. I exhale through the nose. Ten rounds of Sitkari on a hot afternoon, ideally in the shade, provides relief that is both physiologically real and psychologically clarifying.

A third cooling practice I use is Chandra Bhedana — Left Nostril Breathing — which I mentioned in the context of Nadi Shodhana. Closing the right nostril and breathing exclusively through the left activates the ida nadi, the lunar channel, whose energy is cooling and calming. This is my go-to practice when the heat is emotional rather than environmental — when I am running hot with frustration or urgency — because it addresses both the physical and the subtle-body dimensions of excess heat.

The Science

The cooling effect of Sitali and Sitkari is well documented in the ayurvedic and modern yoga therapy literature. The physiological mechanism involves evaporative cooling of the incoming air through the wet surfaces of the tongue and oral mucosa, analogous to panting in dogs but more deliberate and controlled. These techniques also activate the parasympathetic nervous system through the extended, nasal exhale that follows each cooled inhale, which lowers heart rate, reduces metabolic heat production, and promotes the rest-and-digest state (Yoga International, 2022). They are classified in classical texts, including the Hatha Yoga Pradipika as explicitly cooling pranayamas, prescribed to reduce pitta — excess fire — in the body. Modern research on these specific techniques remains limited compared to Bhramari and Nadi Shodhana, but their mechanisms are physiologically sound, and several decades of clinical yoga therapy practice have confirmed their practical effectiveness for thermal regulation and fever management (Ornish, 2023).

Section 8: Integration — A Morning Practice on the Ranch

On a typical morning in Caballo, I wake before the light comes over the mountains to the east. Before I check the horses, before I make coffee, I sit for twenty to thirty minutes with my breath. My sequence runs roughly as follows:

I begin with five minutes of slow diaphragmatic breathing, establishing the foundation and letting the nervous system transition from sleep to waking. Then I move into seven rounds of Bhramari with Shanmukhi Mudra, pressing the sound deep into the sinuses and skull. After Bhramari, I practice five to eight rounds of Nadi Shodhana, then four cycles of 4-7-8 breathing. If I am cold, I add two rounds of Bhastrika before beginning the sequence. The whole practice takes twenty-five to thirty minutes.

In the evening, particularly if the tinnitus has been active during the day, I return to five rounds of Bhramari and four cycles of 4-7-8 lying in bed. This has become my most reliable path to sleep.

I share this practice not as a prescription but as testimony. I am not cured of tinnitus. But I am its master, not its servant. The ringing is still there most mornings. But I have learned to breathe underneath it, to find the space between the sounds, and to let the ancient technology of pranayama do what it has been doing for human beings for at least three thousand years: restore the nervous system to its natural state of balance, ease, and presence.

As Chitrabhanu taught me: the enemy is not outside. The fire, the fear, the ringing in the ear — these arise from imbalance within. And the breath, which is always with us, always available, is the most direct tool we have to restore that balance. Breathe deeply. Hum gently. Exhale long. The body knows what to do.

References

Benson, H., Lehmann, J. W., Malhotra, M. S., Goldman, R. F., Hopkins, J., & Epstein, M. D. (1982). Body temperature changes during the practice of g Tum-mo yoga. Nature, 295, 234–236. https://doi.org/10.1038/295234a0

Chetry, D., Chhetri, A., Rajak, D. K., Rathore, V., & Gupta, A. (2024). Exploring the health benefits of bhramari pranayama (humming bee breathing): A comprehensive literature review. Indian Journal of Physiology and Pharmacology, 68, 71–85. https://doi.org/10.25259/IJPP_325_2023

Gunjawate, D. R., Ravi, R., & Raman, M. (2023). Bhramari pranayama in tinnitus: A systematic review. Indian Journal of Otology, 29(3), 146–151. https://doi.org/10.4103/indianjotol.indianjotol_40_23

Gunjawate, D. R., & Ravi, R. (2021). Effect of yoga and meditation on tinnitus: A systematic review. Journal of Laryngology and Otology, 135(4), 284–287. https://doi.org/10.1017/S0022215121000827

Ismail, A. M., Ali, S. M., Ghuiba, K., Elfahl, A. M., Tolba, A. M., & Ghaleb, H. A. (2025). Autonomic functions, tinnitus annoyance and loudness, and quality of life: Randomized-controlled responses to bee-humming (vibrational) respiratory training in tinnitus elderly. [PMC12895279]. PubMed Central. https://pmc.ncbi.nlm.nih.gov/articles/PMC12895279/

Lehrer, P., & Gevirtz, R. (2014). Heart rate variability biofeedback: How and why does it work? Frontiers in Psychology, 5, 756. https://doi.org/10.3389/fpsyg.2014.00756

Maniscalco, M., Weitzberg, E., Sundberg, J., Sofia, M., & Lundberg, J. O. (2003). Assessment of nasal and sinus nitric oxide output using single-breath humming exhalations. European Respiratory Journal, 22(2), 323–329. https://doi.org/10.1183/09031936.03.00098102

Ornish, D. (2023). Yoga to stay cool and balanced in the summer heat. Ornish Lifestyle Medicine. https://ornish.com/zine/yoga-to-stay-cool-and-balanced-in-the-summer-heat/

Pandey, S. (2011). Bhramari pranayama and alternative treatments of tinnitus: In pursuit of the cure. In Up to Date Tinnitus. InTech Open.

Rajasekaran, A. K., Belur, Y. K., Ilavarasu, J., & Srinivasan, T. M. (2023). Nitric oxide, humming and Bhramari pranayama. Indian Journal of Science and Technology, 16, 377–384.

Saoji, A. A., Raghavendra, B. R., & Manjunath, N. K. (2019). Effects of yogic breath regulation: A narrative review of scientific evidence. Journal of Ayurveda and Integrative Medicine, 10(1), 50–58. https://doi.org/10.1016/j.jaim.2017.07.008

Saoji, A. A., Raghavendra, B. R., Rajesh, S. K., & Manjunath, N. K. (2020). Suryabheda pranayama: A metabolic and respiratory study. [PMC7336938]. PubMed Central. https://pmc.ncbi.nlm.nih.gov/articles/PMC7336938/

Telles, S., Singh, N., & Bhardwaj, A. K. (2013). Effects of slow and fast pranayamas on autonomic functions in healthy volunteers. Journal of Alternative and Complementary Medicine, 19(11), 888–895. https://doi.org/10.1089/acm.2012.0625

Trivedi, G., Sharma, K., Saboo, B., Kathirvel, S., Konat, A., Zapadia, V., Prajapati, P. J., Benani, U., Patel, K., & Shah, S. (2023). Humming (Simple Bhramari Pranayama) as a stress buster: A Holter-based study to analyze heart rate variability (HRV) parameters during Bhramari, physical activity, emotional stress, and sleep. Cureus, 15(4), e37527. https://doi.org/10.7759/cureus.37527

Weitzberg, E., & Lundberg, J. O. N. (2002). Humming greatly increases nasal nitric oxide. American Journal of Respiratory and Critical Care Medicine, 166(2), 144–145. https://doi.org/10.1164/rccm.200202-138BC

Yoga International. (2022). Beat the heat: Sitali and Sitkari. https://yogainternational.com/article/view/beat-the-heat-sitali-and-sitkari/

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