

WELLNESS TEAM CULTURE

Evidence-based wellness, leadership, and team dynamics

RESEARCH BRIEF · THE EVIDENCE, PLAINLY

Five Minutes, On Purpose

ISSUE 89 · AUGUST 11, 2026 · BREATH & REGULATION

Breathing is the autonomic function most open to deliberate control. In one exploratory trial, five minutes a day for a month improved mood and lowered resting breathing rate more than an equal period of mindfulness meditation. A larger placebo-controlled trial then found no advantage for a slower breathing rate over an ordinary one. Both results stand, and they are not in conflict, because they varied different things.

WHAT WAS ACTUALLY STUDIED

01 Yilmaz Balban et al. (2023), Cell Reports Medicine

TIER 1 · RANDOMIZED CONTROLLED TRIAL (EXPLORATORY)

One hundred eight adults, randomized to one of three five-minute daily breathing practices (cyclic sighing with prolonged exhalations, box breathing with equal phases, or cyclic hyperventilation with retention) or to an equivalent daily period of mindfulness meditation, for 28 days. Conducted entirely remotely. Mood and state anxiety were rated before and after every session; resting heart rate, heart rate variability, respiratory rate, and sleep were captured continuously by a wrist-worn wearable. Group sizes were 24 meditation, 30 cyclic sighing, 21 box breathing, and 33 cyclic hyperventilation. The authors state the study was powered to compare combined breathwork against meditation, not to rank the three breathing patterns against each other. Most participants were recruited from a single Stanford undergraduate psychology class.

02 Fincham, Strauss & Cavanagh (2023), Scientific Reports

TIER 1 · PLACEBO-CONTROLLED RANDOMIZED TRIAL

Four hundred participants, described by its authors as the largest parallel breathwork trial to date, randomized and blinded to either coherent breathing at approximately 5.5 breaths per minute or an attention-matched placebo at 12 breaths per minute, roughly 10 minutes a day for four weeks. Critically, both arms were paced with equal inhalation to exhalation ratios, so the only variable that differed between them was breathing rate. The two arms did not differ on how credible participants found their assigned practice or how much benefit they expected from it. There was no non-breathing control arm.

03 Fincham et al. (2023), Scientific Reports (meta-analysis)

TIER 1 · META-ANALYSIS OF RANDOMIZED TRIALS

A systematic search across seven databases and trial registries to February 2022, from 1,325 initial results, pooling randomized controlled trials of breathwork against control conditions. Twelve trials with 785 adults contributed to the primary outcome of self-reported stress; 20 trials informed anxiety and 18 informed depressive symptoms. Most included studies were rated at moderate risk of bias. All outcomes are self-report.

04 Im, Lee & Woo (2026), Applied Psychophysiology and Biofeedback

TIER 3 · PILOT STUDY

A small pilot comparing 14 mothers of children with disabilities against 14 controls across three consecutive five-minute conditions in fixed order: resting baseline, cognitive stress, then slow-paced breathing at approximately 0.1 Hz. Not randomized. Heart rate variability indices and self-reported emotional states were measured in each condition. Included here only for the within-session physiology finding, and read as preliminary given the design and sample size.

WHAT THEY FOUND

Deliberate breathing beat mindfulness meditation on one outcome only: positive mood. In the Stanford trial all four groups reported lower state anxiety, less negative mood, and better positive mood after their daily session, meditation included, and on state anxiety and negative mood no group beat another. The separation appeared on positive mood, where the breathing conditions as a group pulled ahead of meditation. Among the individual arms, cyclic sighing (a normal inhale through the nose, a second shorter inhale to top the lungs off, then a long slow exhale through the mouth) was the only one to reach significance against meditation. The other two breathing arms scored higher than meditation but not significantly, and the trial was not powered to rank the three breathing patterns against each other, so nothing here shows cyclic sighing beating box breathing or cyclic hyperventilation (Yilmaz Balban et al.).

Cyclic sighing also produced a significant reduction in resting respiratory rate relative to meditation across the 28 days, and the reduction in breathing rate was weakly and inversely correlated with the improvement in positive mood ($r = -0.24$), a relationship far too small to describe any individual person. That arm was also the only one whose daily mood benefit grew with the number of days practiced (Yilmaz Balban et al.).

5 min

the entire daily dose, held for 28 days. Notably, heart rate variability and resting heart rate did not measurably change across the trial in any group, which leaves resting respiratory rate as the only physiological marker that moved over the month (Yilmaz Balban et al.).

A separate UK group then tested the rate directly, and found nothing. Randomizing 400 blinded participants to slow paced breathing at 5.5 breaths per minute or an attention-matched placebo at 12 breaths per minute, they found no significant group-by-time interaction and no main effect of group on stress, anxiety, depression, or wellbeing, at either the post-intervention timepoint or one-month follow-up. Both arms improved from baseline over the four weeks. Neither beat the other. Because the two arms did not differ in how credible participants found their practice or how much benefit they expected, differing expectancy cannot account for that null. Their conclusion is precise: no measurable effect of coherent breathing over and above a well-designed breathwork placebo (Fincham, Strauss & Cavanagh).

Across the wider literature the effect is small, and the evidence supporting it is not strong. Pooling twelve randomized trials (785 adults, most at moderate risk of bias, heterogeneity of 42 percent), breathwork was associated with lower self-reported stress at a small effect size (Hedges' $g = -0.35$, 95% CI -0.55 to -0.14), an interval spanning anything from near-trivial to moderate. Anxiety across 20 trials came in at $g = -0.32$ and depressive symptoms across 18 trials at $g = -0.40$, with heterogeneity moderate and statistically significant for both. The authors close by urging caution and calling for lower risk-of-bias designs, in their words to avoid a miscalibration between hype and evidence (Fincham et al.).

Measured physiology and felt state do not always agree. In a small 2026 pilot, during the slow-paced breathing block the global heart rate variability indices and the low-frequency band rose significantly while the vagally mediated indices stayed flat, a pattern the authors read as resonance through baroreflex coupling rather than direct amplification of vagal tone. Anxiety and tension fell in both caregivers and controls, yet the caregivers still reported elevated perceived stress. The authors call this a psychophysiological dissociation (Im, Lee & Woo).

Four sources, and the honest reading turns on one distinction.

The two trials that look like they contradict each other varied different things. The head-to-head trial varied the shape of the breath, and the arm that stretched the exhale was the only one to separate from meditation on mood and on resting breathing rate (Yilmaz Balban et al.). The placebo-controlled trial held the inhale and exhale equal in both arms and varied only the rate, 5.5 breaths per minute against 12, and found no advantage for the slower one (Fincham, Strauss & Cavanagh). So rate was tested directly and came back null. Exhale emphasis has never been tested against another breathing pattern with adequate power, which makes it unresolved rather than disproven. Those are different claims and the popular coverage routinely blurs them.

The meta-analysis sizes the whole category honestly: small, heterogeneous, mostly moderate risk of bias, entirely self-report (Fincham et al.). The pilot adds that the autonomic numbers and the reported feeling can point in different directions inside a single session (Im, Lee & Woo). What survives all four is narrow. A short daily deliberate breathing practice, sustained for weeks, is associated with modest improvements in mood and stress, and one exploratory trial links an exhale-emphasized version to a measurable drop in resting breathing rate. Which named technique or tempo you pick is not where the evidence points. Rate was tested and made no difference; exhale emphasis is untested against its rivals; adherence has the most face validity but rests on a single interaction effect in a single arm of a single exploratory trial.

The mechanism people reach for is respiratory sinus arrhythmia: heart rate rises on inhalation and falls on exhalation, so a longer exhale spends more of each cycle on the parasympathetic side of that oscillation. That is a plausible rationale for emphasizing the exhale, but none of these four studies tested it. The Stanford trial found no change in heart rate variability or resting heart rate, which is not support for a vagal mechanism, and the caregiver pilot read its own slow-breathing effect as baroreflex resonance rather than direct vagal amplification. Treat the mechanism as a reasonable hypothesis, not as the finding.

WHAT THIS DOES NOT PROVE

The head-to-head trial was not prospectively registered. Its authors describe it as exploratory, registered retrospectively, and roughly equivalent to a phase 1 or 2 initial-efficacy study. It was powered to compare combined breathwork against meditation and explicitly not powered to rank the individual breathing arms, which is the limitation that matters most here: it is the reason no claim can be made that cyclic sighing beats box breathing or the inhale-emphasized pattern. Most participants came from one undergraduate psychology class, the remote design meant nobody verified how the exercises were actually performed, and the window was four weeks with no follow-up, so nothing speaks to persistence. Heart rate variability and resting heart rate did not change over the month, leaving the physiological story resting on a single marker.

The placebo-controlled trial does not show that breathing does nothing. It shows that one slow rate did not outperform another paced-breathing condition in a self-selected online sample using self-report outcomes, and a failure to detect a difference is not a demonstration of absence. It also had no passive or no-treatment arm, so the improvement both arms shared cannot be credited to breathing rather than to time, repeated measurement, or regression to the mean.

The meta-analysis pools heterogeneous interventions and mostly moderate-risk-of-bias trials on twelve studies for its primary outcome, so its estimate is a rough magnitude rather than a precise one. The caregiver study is a non-randomized pilot with 14 people per group, a fixed condition order, and a mean age difference between groups (49.0 against 43.9 years) despite the age-matched label. Across all four papers, every primary outcome is self-report.

None of this is a treatment for a diagnosed condition, and none of it is medical advice. Slow, gentle breathing sits at the low-risk end of this research. Fast or breath-hold styles do not, and the Stanford trial screened out volunteers with heart disease, glaucoma, seizure history, pregnancy, psychosis, suicidality, bipolar disorder, or substance use disorders. Anyone with a cardiac or respiratory condition should ask a clinician before adding a paced practice.

WHAT IT MEANS FOR YOU

Pick one pattern and stop comparing techniques, because the one variable that was tested directly, breathing rate, made no difference. Cyclic sighing is the reasonable default rather than the proven winner: it is the only individual arm that separated from meditation, and the published protocol is a normal inhale through the nose, a second shorter inhale on top of it, then a long slow exhale through the mouth, repeated for five minutes. Emphasize the exhale rather than the inhale, on the grounds that this is the half of the cycle where heart rate falls and the exhale-extended arm is the one with the signal, while remembering it was never tested head to head against the inhale-heavy pattern. Track resting respiratory rate rather than heart rate variability, because over 28 days in the Stanford trial respiratory

rate was the only marker that changed, and that trial read it off an ordinary wrist wearable. Run the practice on ordinary days rather than only bad ones, both because that is how both of the daily-practice trials dosed it and because the numbers and the feeling can disagree within a single session. And give it four weeks before deciding, since the mood benefit in the strongest arm grew with the number of days practiced and four weeks was the entire study window. The newsletter walks through those five moves. The research above is why they are the five, and where each one runs out.

GO TO THE SOURCE

TIER 1 · RCT Yilmaz Balban, M., Neri, E., Kogon, M. M., Weed, L., Nouriani, B., Jo, B., Holl, G., Zeitzer, J. M., Spiegel, D., & Huberman, A. D. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. *Cell Reports Medicine*, 4(1), 100895. doi.org/10.1016/j.xcrm.2022.100895

TIER 1 · PLACEBO-CONTROLLED RCT Fincham, G. W., Strauss, C., & Cavanagh, K. (2023). Effect of coherent breathing on mental health and wellbeing: a randomised placebo-controlled trial. *Scientific Reports*, 13(1), 22141. doi.org/10.1038/s41598-023-49279-8

TIER 1 · META-ANALYSIS Fincham, G. W., Strauss, C., Montero-Marin, J., & Cavanagh, K. (2023). Effect of breathwork on stress and mental health: a meta-analysis of randomised-controlled trials. *Scientific Reports*, 13(1), 432. doi.org/10.1038/s41598-022-27247-y

TIER 3 · PILOT Im, C.-H., Lee, S., & Woo, M. (2026). Heart rate variability and slow-paced breathing in mothers of children with disabilities: autonomic flexibility under chronic caregiving stress. *Applied Psychophysiology and Biofeedback*. doi.org/10.1007/s10484-026-09771-z

Tier 1 means peer-reviewed primary research or meta-analysis, the strongest evidence. Tier 2 means an expert framework or smaller study that traces to peer-reviewed work. We grade every source so you can see the weight behind each claim.

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