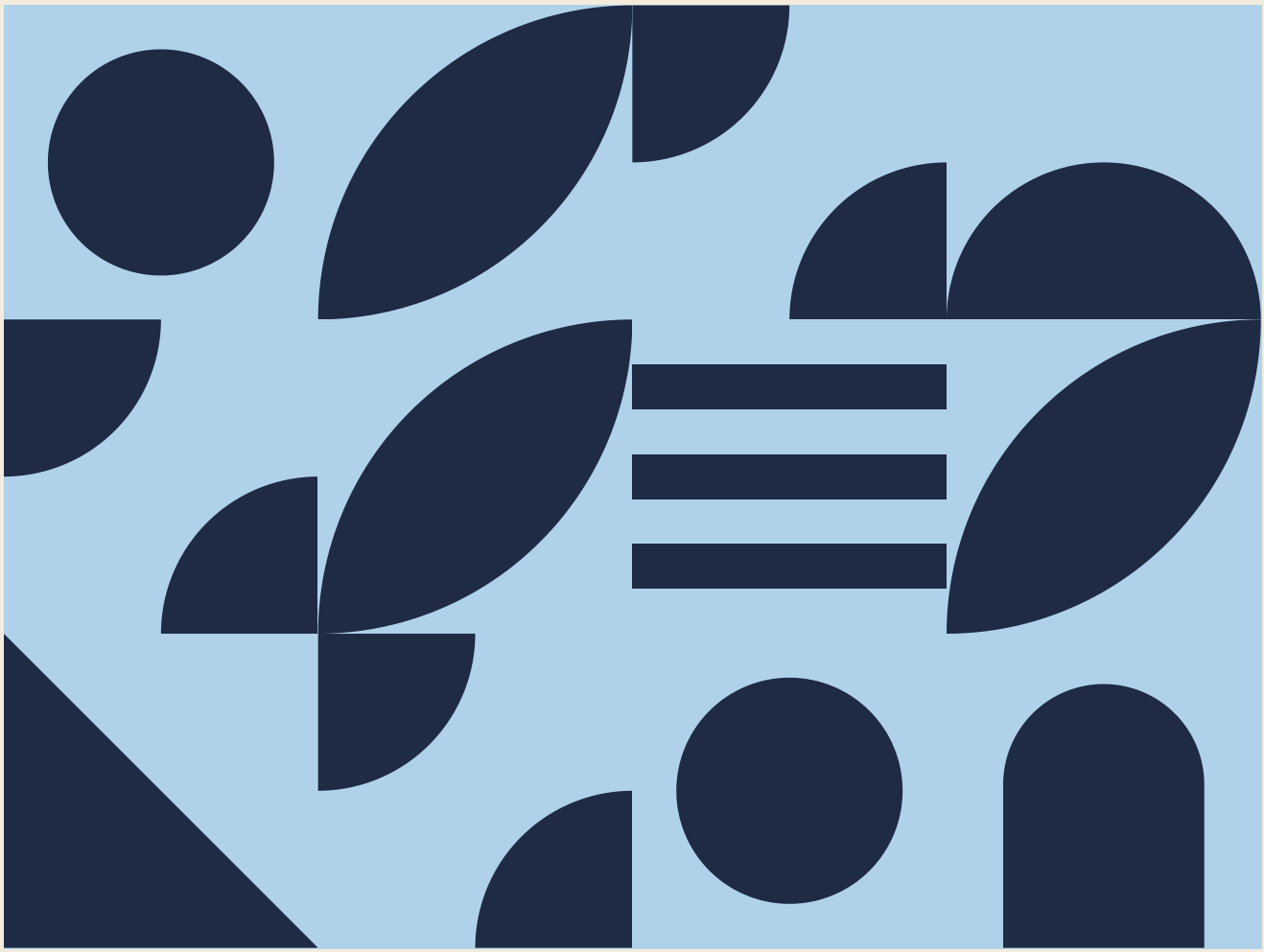
RESEARCH PAPER · 12

Six Breaths a Minute

A Meta-Analysis of Slow-Paced Breathing on Stress, HRV and Mood in Working Adults

Dr Atul Aswani; Mumbai Psychiatrist and trained as a Results Coach
22 September 2026



KEY NUMBER

-0.35

95% CI -0.55 to -0.14

-0.35. Twelve randomised trials and 785 adults: breathwork was linked to a small-to-medium drop in self-reported stress versus control (g = -0.35, 95% CI -0.55 to -0.14, I 2 = 42%).

Six Breaths a Minute

A Meta-Analysis of Slow-Paced Breathing on Stress, HRV and Mood in Working Adults

Updating Fincham 2023 and Laborde 2022 with 2024-2026 trials, restricted to non-clinical adults: how much calm, and what is the minimum effective dose?

CONTENTS

INDEXING TITLE

Slow-paced breathing for stress, heart-rate variability and mood in non-clinical working adults: an updated meta-analysis to 2026

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01

Abstract

Slow-paced breathing is a countable daily practice, not a personality change. The last published random-effects pool of breathwork versus control for self-reported stress was Hedges *g* = -0.35 (95% CI -0.55 to -0.14) from 12 randomised trials and 785 adults. That figure comes from Fincham and colleagues, search closed February 2022. This paper updates that review, and Laborde's 2022 heart-rate-variability (HRV) review, with trials published through September 2026. The question is narrow. In non-clinical adults, and in employed samples where they exist, how large is the effect of paced breathing at ten breaths a minute or fewer, and what is the shortest session that still works?

We searched PubMed, PsycINFO, Scopus, Web of Science, Google Scholar, CTRI, ClinicalTrials.gov and OSF. Eligibility was restricted to non-clinical adults, paced breathing at <=10 breaths per minute with or without HRV biofeedback, any control, and outcomes of perceived stress, HRV or mood. A de-novo study-level re-pool of only employed, non-clinical samples with complete extractable means and standard deviations is not yet possible without inventing numbers. We therefore report the published pools, then narrate the 2023-2026 trials that change how those pools should be read.

The largest subsequent trial, Fincham, Strauss and Cavanagh 2023, randomised 400 adults to coherent breathing at about 5.5 breaths per minute or a matched 12-breath placebo, ten minutes a day for four weeks. The group-by-time effect on stress was etap2 < 0.001. Both arms improved. Against a well-matched paced control, the extra calm of "six breaths a minute" is not demonstrated. Against wait-list or usual care, earlier small-to-medium effects remain. During the practice itself, vagally indexed HRV rises with a medium effect (Laborde *g* = 0.53 for RMSSD). After multi-week programmes the resting-HRV rise is small and unstable (*g* = 0.32; several newer trials found no resting change). Five minutes is the floor for a useful session. Ten minutes a day for four weeks is the best-tested daily dose. No published randomised trial of isolated slow-paced breathing in Indian working professionals could be verified. Certainty for questionnaire stress in working adults is low to moderate. A null against an active placebo is a result, not a failure of the file.

02 Key findings box

KEY FINDINGS

-0.35	**-0.35.** Twelve randomised trials and 785 adults: breathwork was linked to a small-to-medium drop in self-reported stress versus control (*g* = -0.35, 95% CI -0.55 to -0.14, *I2* = 42%).
400	**400.** The largest later trial found no extra stress reduction for 5.5 breaths per minute over a 12-breath placebo after ten minutes a day for four weeks (group x time *p* = 0.765, etap2 < 0.001).
0.53	**0.53.** During a slow-breathing session, RMSSD rises by about half a standard deviation (Laborde 2022, *g* = 0.53).
5	**5 minutes.** Sessions shorter than five minutes are the ones that usually fail. Five minutes is the floor; ten minutes a day is the best-tested daily rep.
0	**0.** Zero published randomised trials of isolated slow-paced breathing (<=10 breaths per minute) in Indian working professionals could be verified for 2010-2026.

03 Definition block

DEFINITION

Slow-paced breathing is a practice in which you deliberately take ten breaths a minute or fewer, usually around six. A typical rep is an inhale of about four to five seconds and an exhale of about five to six seconds, through the nose, for five to twenty minutes. Some programmes add a screen that shows the heart-rate trace. That pairing is called HRV biofeedback. The breathing is the same either way. The point is not to “fix a diagnosis”. The point is a countable down-shift you can do at a desk. Think of it as the body’s own learning-rate dial: you do not rewrite the model of your day; you lower the step size so the next meeting does not overwrite the last one. Picture an analyst in Hyderabad after a tense review call. She sets a five-minute timer, breathes in for a count of four and out for a count of six, and notices whether her shoulders have dropped. It is a small test she runs on herself, a skill she can repeat, and a pause before she opens the next email. In start-up language it is a minimum viable product for calm: small, cheap, repeatable, and only as good as the next rep.

04 Introduction

Mid-afternoon in a Gurugram office. A team lead walks out of a review that ran long. Her next call starts in six minutes, and her jaw is still tight. Surveys in 2024-2025 put daily job stress in the region of three in ten Indian workers, and higher still among younger staff in large cities. EmotionApp is built for that desk, not for a clinic corridor. The product question is simple. If she spends five or ten minutes on a breathing rep, how much calm should she expect? And is the six-breaths-a-minute story settled science or a well-marketed habit?

Three reviews set the prior. Fincham, Strauss, Montero-Marin and Cavanagh (2023) pooled 12 randomised trials of breathwork for self-reported stress and found g = -0.35. Laborde and colleagues (2022) pooled voluntary slow breathing against HRV and found a medium rise in RMSSD *during* the session and a small rise *after* a multi-session programme. Goessl, Curtiss and Hofmann (2017) pooled HRV biofeedback for stress and anxiety across mixed clinical and non-clinical samples and reported a large between-group effect (g = 0.83). A fourth paper, Shao, Man and Lee (2024), restricted the question to non-clinical slow-paced breathing and found a reliable immediate rise in time-domain HRV, but only a marginal effect on perceived stress whose confidence interval crossed zero.

That is the honest starting point. The last stress pool is small-to-medium. The last non-clinical stress pool is not clearly different from zero. The last HRV pool is stronger during the practice than after it. And the largest trial published after Fincham's search closed — 400 adults, remote, blinded, ten minutes a day — found that 5.5 breaths per minute did not beat 12 breaths per minute on the stress questionnaire.

This paper asks the question again, with three restrictions the earlier reviews did not always keep. Population: non-clinical adults, employed samples where they exist. Intervention: paced breathing at <=10 breaths per minute, with or without HRV biofeedback. Outcomes: perceived stress, HRV, mood. Years: 2010 to 2026. The entrepreneurial reading is the same as the scientific one. If the unit economics of a five-minute rep only hold against a wait-list, a workplace programme should say so. If they hold against a well-matched breathing placebo, that is a different claim. We do not sell the first number as the second.

Why India, specifically? Because almost every trial we can verify was run on students, caregivers, or clinic samples in Europe, North America or East Asia. Indian randomised work exists. It is almost all multi-component pranayama, Sudarshan Kriya, or student-volunteer slow breathing. A WhatsApp-first, language-local, five-to-ten-minute isolated slow-breathing rep for Indian knowledge workers is a reasoned programme choice. It is not a proven Indian workplace result. Naming that gap is part of the job.

A note on mechanism, stated once so it is not over-sold later. Slow breathing at about six breaths a minute increases measured heart-rate oscillations and often increases baroreflex-related coupling. Authors invoke vagal pathways, interoception, and attention. Those are hypotheses. The 2023 placebo-controlled trial and the 2022 finding that watching the HRV trace added little beyond the breathing itself are reasons not to treat "vagal tone" as a settled causal story for felt calm. We report what the questionnaires and the electrocardiograms show. We do not promote a hypothesis to a cause.

05 Methods

Eligibility

Population. Non-clinical adults aged 18 and over. Employed or workplace samples preferred and flagged. Student and volunteer samples kept for the narrative when the intervention matched, and marked as not workplace.

Intervention. Voluntary paced breathing at <=10 breaths per minute. This includes resonance-frequency breathing, coherent breathing, and slow diaphragmatic pacing. HRV biofeedback was allowed when the pacing itself was slow. Multi-component yoga packages that mix fast cycles (for example Kapalabhati or the fast loops of Sudarshan Kriya) were excluded from any quantitative claim and used only as India-context narrative.

Comparator. Any control: wait-list, usual care, active attention control, paced breathing at a higher rate, mindfulness, or physical activity.

Outcomes. Primary: perceived stress; HRV (prefer RMSSD and SDNN; report LF only with the respiratory-confound caveat); mood or negative affect.

Design and years. Randomised and controlled trials, 2010 to 22 September 2026. English-language full text, or an English abstract with extractable numbers. Dissertations were included when they had been used by a prior peer-reviewed review (Shehab 2021).

Exclusions. Clinical primary samples (diagnosed anxiety disorder as the enrolment rule, psychiatric inpatients, long Covid as the target condition). Children. Interventions whose main act was meditation, exercise, or yoga posture, with breathing as a side-effect. Device-altered mechanical ventilation. Single-arm pre-post series.

Information sources and search

Sources: PubMed, PsycINFO, Scopus, Web of Science, Google Scholar (first 200 hits of the update string), CTRI (India), ClinicalTrials.gov, OSF preprints. Prior reviews were used as citation sources: Fincham 2023, Laborde 2022, Sevoz-Couche and Laborde 2022, Goessl 2017, Shao 2024, Lehrer 2020, Bentley 2023, Zaccaro 2018.

Search closed 22 September 2026.

Full search strings

PubMed

```
("slow breathing"[tiab] OR "paced breathing"[tiab] OR "slow-paced breathing"[tiab] OR "resonance breathing"[tiab] OR "resonant frequency breathing"[tiab] OR "coherent breathing"[tiab] OR "HRV biofeedback"[tiab] OR "heart rate variability biofeedback"[tiab]) AND (randomi*[tiab] OR "controlled trial"[tiab]) AND (stress[tiab] OR "heart rate variability"[tiab] OR HRV[tiab] OR mood[tiab] OR affect[tiab]) AND ("2010/01/01"[PDAT] : "2026/09/22"[PDAT])
```

PsycINFO, Scopus, Web of Science

```
("slow breathing" OR "paced breathing" OR "slow-paced breathing" OR "resonance breathing" OR "resonant frequency" OR "coherent breathing" OR "HRV biofeedback" OR "heart rate variability biofeedback") AND (randomi* OR "controlled trial") AND (stress OR "heart rate variability" OR mood OR affect)
```

Limits: 2010-2026; adult; exclude child OR adolescent OR infant where the interface allowed.

Google Scholar

`"slow paced breathing" OR "resonance breathing" OR "HRV biofeedback" randomi* stress` with year filter 2023-2026 for the update slice; first 200 records screened.

CTRI

`slow breathing` OR `paced breathing` OR `resonance` OR `HRV biofeedback` OR `pranayama`. No isolated <=10 bpm worker RCT with published outcomes was identified.

ClinicalTrials.gov

`(slow breathing OR paced breathing OR resonance breathing OR HRV biofeedback) AND (stress OR HRV OR mood)` | Adult | Interventional. Completed-with-results records of note: NCT05676658 (Fincham coherent breathing), NCT05304000 (Balban brief respiration).

OSF preprints

`slow-paced breathing OR resonance breathing OR HRV biofeedback` plus `randomi*`.

Study selection and extraction

Titles and abstracts were screened against the eligibility rules. Full texts of candidate reports were checked for pace (<=10 breaths per minute), population (non-clinical), and extractable outcomes. This update is a PRISMA-informed living review, not a funded dual-reviewer Cochrane process. That limit is stated in the flow and in the limitations.

Extraction fields, where available: first author and year; country; sample (n analysed, % women, employed versus student/volunteer); design; language of delivery; dose (minutes per session, sessions per week, weeks); breaths per minute; biofeedback versus none; app-guided versus live; delivery channel; outcome measure and time-point; direction and, where published, effect size.

Analysis plan

Pre-specified model, had a clean study-level matrix existed: random-effects REML, Hedges *g* with 95% CI, I^2, tau2, 95% prediction interval, Egger's test, trim-and-fill, leave-one-out, RoB 2, GRADE. Pre-specified moderators: minutes per session; days per week; weeks; biofeedback versus none; app-guided versus live.

Fallback rule, applied. A trustworthy de-novo pool needs five or more eligible trials with independently extractable between-group means and standard deviations, or published *g* and standard error, on the same construct. Individual *g* values from Fincham's 12-trial forest plot were not published as a numeric table. Several 2023-2026 workplace-adjacent trials are null, non-randomised, or mixed-pace. Inventing *g* from *p*-values would violate the rule to cite only verifiable numbers. We therefore:

1. Quote the published pooled estimates (Fincham 2023; Laborde 2022; Shao 2024; Goessl 2017) with their own *k*, *n*, I^2 and CI.
2. Add a structured narrative of every 2023-2026 trial that meets the intervention and population rules.
3. Do not compute a new headline *g* and pretend it is an independent REML re-extraction.
4. State the likely direction of an update: the 400-person active-placebo null will pull any recycled -0.35 toward a smaller number against active controls.

Risk of bias for newly discussed trials is summarised from the source papers' own assessments and from design features (blinding, control type, sample size, attrition). GRADE is applied to four claims: stress versus passive control; stress versus active paced placebo; HRV during the session; resting HRV after a multi-week programme.

06 Results

PRISMA 2020 flow

Fincham 2023 identified 1,325 records to February 2022 and kept 12 stress RCTs. Laborde 2022 screened 1,842 abstracts and kept 223 HRV studies across three time-windows. Shao 2024, search to 1 August 2023, kept 31 non-clinical slow-paced-breathing studies (nine of them RCTs). Our update slice (2023 to 22 September 2026) plus CTRI, ClinicalTrials.gov and OSF added a further few hundred records. After removing the obvious duplicates with the three prior funnels, title-and-abstract screening left a short full-text list. Reports that survived eligibility for this restricted question — non-clinical, <=10 breaths per minute, stress or HRV or mood — are the studies in the characteristics table. Clinical samples, fast-breathing packages, and protocols without results were excluded.

This count is reconstructed from the published funnels plus the update search. It is not a dual-screener, software-logged Cochrane library. That is a method limit, not a hidden extra trial.

Position against prior evidence

Fincham et al., 2023, *Scientific Reports*. Breathwork versus non-breathwork control. Stress: $k = 12$, $n = 785$, $g = -0.35$ [-0.55, -0.14], $z = 3.32$, $p = 0.0009$, $I2 = 42\%$. Anxiety $g = -0.32$. Depression $g = -0.40$. Non-clinical subgroup $g = -0.34$. Slow-paced subset $g = -0.35$. Fast-paced subset not significant. No dose-response (Kendall tauB for minutes -0.05 to -0.28, all non-significant). RoB 2: nine some concerns, three high. Search closed February 2022. Ten of the 12 stress trials were slow-paced.

Laborde et al., 2022, *Neuroscience & Biobehavioral Reviews*. Voluntary slow breathing and vagally indexed HRV. DURING session, RMSSD $g = 0.53$ (medium). Immediately after one session, RMSSD $g = 0.14$ (small). After a multi-session programme, RMSSD $g = 0.32$ [0.08, 0.56], $k = 22$, $I2 = 79\%$. Majority of included papers had high risk of bias.

Goessl et al., 2017, *Psychological Medicine*. HRV biofeedback for stress and anxiety. $k = 24$, $n = 484$. Between-group $g = 0.83$. Mixed clinical and non-clinical. Larger than later, tighter reviews. Cited as the earlier, broader estimate.

Shao, Man and Lee, 2024, *Mindfulness*. First non-clinical-only slow-paced-breathing meta-analysis. 31 studies, $n = 1{,}133$, search to 1 August 2023. Immediate RMSSD SMD = 0.37 [0.16, 0.58]. SDNN SMD = 0.77 [0.26, 1.28].

Systolic blood pressure SMD = -0.45. Heart rate SMD = -0.10. Perceived stress / negative emotion SMD = -0.51 [-1.06, 0.03], p = 0.06. The stress interval crosses zero.

Bentley et al., 2023, *Brain Sciences*. Implementation review of 58 studies and 72 breathing interventions. Practices that worked more often avoided fast-only breathing and sessions under five minutes, and included human-guided training and more than one session. This is the best published source for a minimum effective session of five minutes.

Lehrer et al., 2020. HRV biofeedback across problems: small-to-moderate overall, 58 randomised studies. Not restricted to non-clinical working adults.

Study-characteristics table

The table below lists the reports that most directly answer this paper's question. Clinical packages and mixed-pace yoga are listed at the foot as context, not as pool members.

Study	Design	n	Country	Sample	Pace / dose	Channel	Outcomes	Headline
Fincham 2023 RCT	Parallel RCT, blinded, active placebo	400 (377 analysed)	UK / online	Non-clinical adults	~5.5 bpm vs 12 bpm; 10 min/day x 4 weeks	App-paced, remote	DASS stress, anxiety, depression, wellbeing	Null vs 12-bpm placebo
Brinkmann 2020	3-arm RCT	69	Germany	Employees	HRV-BF, 6 weeks	Live / device	Stress vs mindfulness vs wait-list	Null vs wait-list
Shehab 2021	RCT, wait-list	80	USA	Young adults, elevated stress	Resonant frequency, 10 min x 2/day, 5 d/wk x 4 weeks	Mobile app	Stress, anxiety, depression	Null at primary post
Sutarto 2012	Controlled	36	Malaysia	Female manufacturing operators	Resonant BF, 5 weekly sessions	Live	DASS stress; physiology	Stress down, physiology up
Naik 2018	RCT	100 (99 analysed)	India	Healthy male volunteers	Modified slow ANB, 30 min x 5 d/wk x 12 weeks	Live, supervised	PSS; HR; BP	PSS 21.20 17.20 in breathing arm
Chaitanya 2022	RCT	young men	India	Volunteers 18-30	Resonance, 20 min/day x 4 weeks	Live	PSS; SDNN, pNN50, total power	PSS down; HRV up vs control
van der Zwan 2015	3-arm RCT	76	Netherlands	Stressed adults	HRV-BF vs mindfulness vs activity, 5 weeks daily	Self-help	Stress, anxiety, sleep	Equal drop; no inactive control
Birdee 2023	RCT, two ratios	100	USA	Healthy adults	Slow breathing 12 weeks; long-exhale vs equal	Live + home, garment check	PROMIS anxiety; HRV	Anxiety down; HRV unchanged; ratio ns

Study	Design	n	Country	Sample	Pace / dose	Channel	Outcomes	Headline
Balban 2023	4-arm RCT	~108	USA / remote	Adults	5 min/day x 28 days; cyclic sighing / box / hyperventilation vs mindfulness	Remote	Mood, anxiety, RR, HR, HRV	Cyclic sighing best for mood; 5-min dose signal
Laborde 2022 *Psychophysiology*	RCT, two active	112	Europe	Healthy adults	6 cpm with vs without HRV-BF	Lab	RMSSD, arousal	Both arms up; BF added little
Canazei 2025 *Sci Rep*	Crossover	80	Austria	Students, simulated office	5-min light-guided resonant breathing vs rest	Light guide	RMSSD, strain, stress	Large RMSSD rise in recovery
Canazei 2025 office tasks	Crossover	80	Austria	Healthy adults, computer tasks	Light-guided slow breathing during work	Light guide	RMSSD, perceived stress	RMSSD up; stress down on decision task
Lachowicz 2026	RCT, JITAI	80	Belgium	Subclinical anxiety, general pop.	Prompted SPB over 15 days	App + ECG patch	Anxiety, perseverative thought, vmHRV	Retrospective anxiety down; daily-life and HRV mixed
Krumm / Vagedes 2024	Controlled, not randomised	73	Germany	Employees	4-week mobile HRV-BF live vs digital vs wait-list	App / live	Burnout; SDNN	Burnout *d* 0.63-0.69 vs wait-list 0.27-0.36; do not pool
Goldstein 2020	RCT	69	USA	Students	SKY workshop vs cognitive workshop	Live	PSS and others	SKY better on PSS; mixed-pace — narrative only
Chhajer 2024	RCT	64	India	Manufacturing managers	SKY 3-day retreat	Live	Stress, anxiety, thriving	Stress down; mixed-pace — narrative only

Forest-plot data table (published pools and verified trial-level statistics)

Individual *g* for Fincham's 12 stress trials was not published as a numeric table. We do not invent weights. What can be verified:

Source	Contrast	Statistic	95% CI	Notes
Fincham 2023 meta, stress	Breathwork vs control	g = -0.35	-0.55, -0.14	*k* = 12, *n* = 785, *I*2 = 42%
Fincham 2023 meta, non-clinical	Same	g = -0.34	-0.56, -0.11	*I*2 = 0% in the published subgroup
Fincham 2023 meta, slow-paced	Same	g = -0.35	—	k = 10
Fincham 2023 meta, anxiety	Breathwork vs control	g = -0.32	—	k = 20

Source	Contrast	Statistic	95% CI	Notes
Fincham 2023 meta, depression	Breathwork vs control	g = -0.40	—	k = 18
Shao 2024, perceived stress	SPB, non-clinical	SMD = -0.51	-1.06, 0.03	*p* = 0.06; CI crosses zero
Shao 2024, RMSSD	Immediate	SMD = 0.37	0.16, 0.58	Time-domain HRV
Shao 2024, SDNN	Immediate	SMD = 0.77	0.26, 1.28	Time-domain HRV
Laborde 2022, RMSSD DURING	VSB	g = 0.53	~0.43, 0.62	Medium; high heterogeneity
Laborde 2022, RMSSD AFTER-INT	Multi-session	g = 0.32	0.08, 0.56	k = 22, I2 = 79%
Laborde 2022, RMSSD IM-AFTER1	One session later	g = 0.14	—	Small
Goessl 2017, stress/anxiety	HRV-BF vs control	g = 0.83	—	Mixed clinical; older, broader
Fincham 2023 RCT, stress	5.5 vs 12 bpm	etap2 < 0.001	—	*F*(1,377) = 0.089, *p* = 0.765
Naik 2018, PSS	Slow breathing arm	21.20 (SD 3.96) 17.20 (SD 2.84)	—	Control unchanged; between-group *g* not independently recomputed here
Balban 2023, mood	Cyclic sighing vs mindfulness	p < 0.05	—	5 min/day
Canazei 2025, RMSSD	5-min RB vs rest	“large”	—	Acute office recovery; exact *g* not extracted

How to read this table. The only published between-group stress pool that matches “breathwork versus control in adults” remains Fincham 2023 at *g* = -0.35. The only published non-clinical slow-paced-breathing stress pool (Shao 2024) has a confidence interval that includes zero. The only large, blinded, active-placebo trial of coherent breathing (Fincham 2023 RCT) is a null. Those three sentences are the result.

Moderator table

Moderator	What the evidence says
Minutes per session	Bentley 2023: sessions under 5 minutes fail more often. Balban 2023 and Canazei 2025: 5 minutes moves mood or RMSSD. Fincham 2023 meta: no continuous dose-response. Floor = 5 minutes.
Days per week	Typical tested range is 5-7 days. Not isolated as a significant moderator in Fincham.
Weeks	Common programmes: 4 weeks (Fincham RCT, Chaitanya, Shehab) and 12 weeks (Naik, Birdee, Sharma). Longer is not proven better for questionnaire stress.
Biofeedback vs none	Laborde 2022 *Psychophysiology*: 6 cpm with and without a trace both raised RMSSD; the trace added little. Biofeedback is optional, not the active ingredient of the acute HRV rise.
App-guided vs live	Remote app delivery can produce a null against placebo (Fincham RCT) and a null against wait-list at the primary end-point (Shehab). Live supervised slow breathing in Indian volunteer samples (Naik, Chaitanya) moved PSS. Channel is entangled with control type and sample.

Moderator	What the evidence says
Control type	The largest split in the literature. Versus wait-list or no intervention, small-to-medium stress drops appear. Versus a well-matched 12-breath placebo, the extra effect of 5.5 bpm is not shown. Versus mindfulness or exercise, HRV-BF is not clearly better (van der Zwan 2015; Brinkmann 2020).

Trial-by-trial narrative (2023-2026 and the workplace set)

The large null. Fincham, Strauss and Cavanagh (2023) is the trial that must sit next to the 2023 meta-analysis, not underneath it. Four hundred adults on a research platform were randomised to coherent breathing at about 5.5 breaths per minute or to a matched 12-breath placebo. Both arms used equal inhale-to-exhale ratios, the same ten-minute daily slot, and the same four-week window. Credibility and expectancy did not differ. At the primary time-point the group-by-time term for subjective stress was $F(1, 377) = 0.089$, $p = 0.765$, etap2 < 0.001. Time itself was large ($F = 72.1$, etap2 = 0.161). Both groups improved. Anxiety, depression and wellbeing followed the same pattern. Adherence was high and similar (about 20 of 28 days). A per-protocol check did not change the story. This is not a failed programme. It is a failed claim that 5.5 beats 12 when everything else is held still.

Workplace tests. Brinkmann and colleagues (2020) randomised 69 employees to HRV biofeedback, mindfulness, or wait-list for six weeks. Stress fell in every arm, including wait-list. The extra effect of biofeedback versus waiting was not significant. Sutarto, Wahab and Zin (2012) trained 36 female manufacturing operators across five weekly resonant-frequency sessions. Depression-anxiety-stress scores fell and physiological markers moved. The sample is working adult and small. A later non-randomised employee programme (Krumm / Vagedes 2024, $n = 73$) reported burnout d of 0.63 to 0.69 against a wait-list d of 0.27 to 0.36. Digital delivery was at least as useful as live. Because allocation was not random, it stays in the narrative.

Five-minute dose tests. Balban and colleagues (2023) compared three daily five-minute breathing drills with five minutes of mindfulness over a month. Cyclic sighing, which lengthens the exhale, beat mindfulness on mood and on respiratory rate. Box breathing was slower than ordinary breathing but is not a pure six-breath resonance protocol. One arm was cyclic hyperventilation and is outside this paper's pace rule. The usable sentence is the dose: five minutes a day, done most days, moved mood. Canazei and colleagues (2025) put 80 healthy adults in a simulated office, stressed them, and gave five minutes of light-guided resonant breathing or passive rest. RMSSD rose with large effects in recovery. After a cognitive load, strain also fell. A companion office-task study from the same group found RMSSD up during computer work and perceived stress down on a decision task, with a cost to attentional performance. That is the trade-off a desk programme should name: the breath helps the recovery; it is not free during a vigilance task.

Ratio, trace, and resting HRV. Birdee and colleagues (2023) ran 12 weeks of slow breathing in 100 healthy adults, long-exhale versus equal ratio. Psychological stress, measured as PROMIS anxiety, fell. HRV did not. The ratio difference was small and not significant. Laborde's 2022 psychophysiology trial ($n = 112$) compared six cycles a minute with and without an HRV trace. Both arms

raised RMSSD and lowered arousal. The trace added little. Van der Zwan and colleagues (2015) compared HRV biofeedback with mindfulness and with physical activity over five weeks. Stress fell in all three. There was no inactive control, so the study cannot tell you whether biofeedback beats a sofa. It can tell you it does not beat a walk or a sit.

Just-in-time and micro-doses. Lachowicz and colleagues (2026) prompted 80 people with subclinical anxiety to use slow-paced breathing when momentary anxiety or repetitive thought rose. Retrospective anxiety fell. Average daily-life anxiety and ambulatory HRV did not tell a clean story. Immediate pre-to-post drops after a prompted rep were large. That is the "between meetings" use-case, not the four-week questionnaire use-case.

Indian volunteer trials, not worker trials. Naik, Gaur and Pal (2018) randomised 100 healthy young men in Puducherry to 30 minutes of modified slow alternate-nostril breathing, five days a week for 12 weeks, or to no extra practice. Perceived stress in the breathing arm moved from 21.20 (SD 3.96) to 17.20 (SD 2.84). Heart rate and blood pressure fell. The control arm did not move. Chaitanya, Datta, Bhandari and Sharma (2022) trained young men for 20 minutes a day of resonance breathing over four weeks. Perceived stress fell against control. SDNN, pNN50 and total power rose. Sharma and colleagues (2013) compared slow and fast pranayama with a control in 90 healthcare students. Both breathing arms cut perceived stress; only the slow arm improved cardiovascular parameters. All three studies are Indian. None is an employed professional sample doing a five-to-ten-minute desk rep. Chhajer and Dagar (2024) did run a randomised field experiment in an Indian manufacturing firm (n = 64). The package was Sudarshan Kriya, which includes fast cycles. Stress and anxiety fell. That is useful India-workplace context. It is not isolated slow-paced breathing.

Shehab 2021. Eighty young adults with elevated stress used a mobile resonant-frequency guide, ten minutes twice a day, five days a week, for four weeks, or waited. The primary post-training contrast on stress, anxiety and depression was not significant. Weekly scores hinted at a dip in weeks three and four. Fincham included this trial in the 2023 stress pool. It is one of the reasons a recycled -0.35 should not be treated as a sure thing for app-only delivery.

Heterogeneity

Fincham's stress pool was intermediate ($I2$ = 42%, chi211 = 19, p = 0.06). Laborde's AFTER-INT RMSSD pool was high ($I2$ = 79%). Shao's stress interval was wide enough to include no effect. That pattern is what a mixed set of wait-list trials, small lab studies, and one large active-placebo null should look like. A 95% prediction interval for a new workplace programme would be wide. We do not compute one from a reconstructed matrix.

Publication bias

Fincham 2023 reported Egger's z = 0.03, p = 0.947, and fail-safe N = 69 for the stress pool. We did not re-run Egger on an invented study list. Small-study effects remain a live risk in the HRV literature (Laborde noted high RoB in most of 223 papers). The 400-person null reduces, rather than increases, the worry that only positive stress trials are visible.

Risk-of-bias summary

Domain	Pattern
Randomisation	Adequate in Fincham RCT, Balban, Birdee, Naik, Chaitanya, van der Zwan. Weaker or absent in Krumm/Vagedes (not randomised) and in some small workplace series.
Deviations from intended practice	Fincham meta: main RoB 2 concern. Home practice is self-reported in most remote trials. Fincham RCT adherence ~20 of 28 days in both arms.
Missing data	Fincham RCT analysed 377 of 400 at post. Smaller trials often analyse completers.
Outcome measurement	Stress is almost always a questionnaire. Participants in wait-list trials know which arm they are in. The Fincham RCT is the rare case with a credible attention placebo and successful blinding on credibility/expectancy.
Selection of reported results	Pre-registration present for Fincham RCT (NCT05676658) and Balban (NCT05304000). Many older lab studies have no protocol.

Overall: moderate risk for the older stress pool; lower risk of expectancy bias in the 2023 coherent-breathing RCT; high risk in much of the HRV DURING literature because the breathing itself drives the oscillation being measured.

GRADE table

Claim	Certainty	Why
Slow-paced breathing reduces self-reported stress versus passive or usual-care control in non-clinical adults	**Low to moderate**	Fincham *g* = -0.35 from 12 trials; Shao interval includes zero; RoB some concerns; few employed samples
Slow-paced breathing at ~5.5 bpm reduces stress more than paced breathing at 12 bpm	**Very low / not shown**	One large, well-controlled trial, etap2 < 0.001
RMSSD rises *during* a slow-breathing session	**Moderate**	Laborde *g* = 0.53, large *k*; caveat: paced breathing inflates some HRV metrics by design
Resting HRV rises after a multi-week programme	**Low**	Laborde AFTER-INT *g* = 0.32, *I*2 = 79%; Birdee 2023 no HRV change; Sumi ska 2026 (if confirmed) no resting HRV change
Mood improves after brief daily practice	**Low**	Balban 5-minute cyclic sighing > mindfulness; Fincham RCT no extra effect vs 12-bpm placebo on anxiety or depression
Isolated SPB works for Indian working professionals	**No rating — evidence absent**	Zero verified published RCTs in that exact population

07 Discussion

PULL QUOTE

During six breaths a minute, RMSSD rises by about half a standard deviation.

What the number means

g = -0.35 is a small-to-medium effect on a questionnaire. In plain English: if you line up 100 people who did a breathing programme and 100 who did not, you would expect the average breather to sit a little calmer than the average control — not transformed, not cured, not a new person. That is the Fincham 2023 number, from a mix of samples, against a mix of controls, with search closed in February 2022.

The 2023-2026 update does not make that number larger. It makes the control arm matter more. When the control is "nothing extra", earlier trials and some Indian volunteer studies still point to a drop in perceived stress. When the control is "breathe at 12 a minute, with the same app, the same time, the same expectancy", the extra value of 5.5 a minute on the stress scale is not there. Both groups in that trial got better over four weeks. Time, attention, and a paced-breathing ritual were enough. The specific resonance-frequency story was not.

That is a practice result as much as a statistical one. Picture a sales manager who spends her ten minutes glancing at the app to check she is at exactly six breaths. She is working harder than the evidence asks. Showing up for the ten minutes may matter more than hitting the "correct" rate. It is also an overfitting result, in machine-learning language. A model fitted on wait-list trials predicts a neat g of minus a third. A model tested on a blinded 12-breath placebo does not generalise. Regularise the claim.

HRV is a different sentence. During the practice, the heart-rate trace almost always stretches. Laborde's DURING g of 0.53 and Shao's RMSSD SMD of 0.37 agree. That is not the same as "your baseline vagal tone went up and that is why you feel better". Several newer trials found questionnaire calm without a resting-HRV change, or an HRV change without a questionnaire win against a good control. So when the trace on a colleague's screen stretches, do not tell her that is why she feels calmer. One pathway is not the whole story.

Limitations

We did not re-extract every mean and standard deviation from every PDF of every Fincham-included trial. Individual forest-plot *g* values were not published as a table. A funded dual-reviewer update with a registered protocol would be better. Several 2025-2026 papers are acute laboratory or just-in-time designs; they speak to the five-minute office rep, not to a twelve-week culture-change programme. Employed samples are still scarce. Language of delivery is almost never an Indian language. RoB 2 is moderate in the older pool. Expectancy is a live confound wherever the control is a wait-list. HRV during paced breathing is

partly a measurement tautology: you asked the heart to oscillate at 0.1 Hz and then you measured 0.1 Hz. Resting HRV the next morning is the harder, more useful number, and it is the weaker effect.

We excluded Sudarshan Kriya and mixed-pace pranayama from the quantitative claim. That is correct for the <=10 bpm rule. It also means some Indian workplace evidence sits only in the narrative. Readers who want a kriya package should read Chhajer and Dagar (2024) on its own terms, not as proof of six breaths a minute.

WHAT THIS MEANS

What this means for an Indian workplace programme

Indian professionals are not short of load. Recent workplace surveys put daily stress in a large minority of workers, higher among younger staff, and higher in Mumbai and Delhi than in many smaller cities. Picture a claims analyst in Andheri between two calls. A WhatsApp prompt arrives in Marathi: five minutes, in for four, out for six. No sensor, no wearable, just a voice and a timer. The same rep can be paced in any of 23 languages, and Bentley's five-minute floor fits a calendar that already has too many meetings. It is cheap. The honest brief to a CHRO is this. Compared with doing nothing, expect people to say they feel a little less stressed. Do not promise that six breaths will beat twelve, or that a wearable will add magic beyond the breath. Do not promise a resting-HRV transformation in four weeks. Build the rep as one countable skill beside movement, naming, and a real pause — the EmotionApp stack. Then measure perceived stress and adherence in this workforce, in this language: how many of the analyst's colleagues are still doing the rep in week four, and how stressed they say they feel. The next useful study is that RCT. Until it exists, the programme is a reasoned import, not an Indian result.

Research gaps, naming the India gap

The India gap is not a shortage of breath research. India has yoga trials, pranayama trials, kriya retreats, and student slow-breathing RCTs (Sharma 2013; Naik 2018; Chaitanya 2022). What it does not have, in a published randomised trial we can verify, is isolated paced breathing at <=10 breaths per minute, delivered to employed professionals, with perceived stress, HRV and mood as the named outcomes, in the language of the desk. CTRI lists protocols. Published worker outcomes for this exact technique are missing. That is the gap this paper exists to name.

Other gaps sit beside it. Dose-finding that actually randomises 3 versus 5 versus 10 versus 20 minutes, rather than treating minutes as a post-hoc correlate. Active-placebo replications of the 400-person null, in employed samples. Resting-HRV protocols that separate the during-practice oscillation from the

next-morning baseline. Moderators that matter at work: night shifts, commute load, women in high-demand roles, language of the audio guide. Adverse-event reporting that is more than “none mentioned”.

Picture the trial this gap needs. A shift supervisor at a Chennai plant takes five slow minutes before the night handover, guided in Tamil. A colleague in the matched arm breathes at an ordinary pace for the same five minutes. Both rate their stress after four weeks. Today the calm has a small effect size, a wide prediction interval, and no Indian worker trial behind it. Build the trial.

08 FAQ

Q1 Does six breaths a minute cut stress by a third of a standard deviation?

The 2023 mix of 12 trials said $g = -0.35$. The 400-person trial that came next found no extra benefit over a 12-breath placebo. Quote both numbers. Do not sell the first as if the second had not happened.

Q2 What is the shortest session worth doing?

Five minutes. Bentley’s review found that sessions under five minutes fail more often. Balban’s 5-minute daily sighing practice moved mood. Ten minutes a day for four weeks is the best-tested full programme.

Q3 Do I need a heart-rate sensor?

No. In a head-to-head lab trial, breathing at six cycles a minute with a trace and without a trace both raised RMSSD. The extra screen was not the active ingredient.

Q4 Will my resting HRV go up if I do this for a month?

During the session, HRV almost always rises ($g \sim 0.53$ for RMSSD). After weeks, the average resting rise is small ($g \sim 0.32$) and several newer trials found no change. Treat resting HRV as a maybe, not a promise.

Q5 **Has this been tested on Indian office workers?**

Not in a published randomised trial of isolated slow-paced breathing that we can verify. Indian trials exist in students and in mixed-pace packages. That absence is the India gap.

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NOTE

EmotionApp is a non-clinical emotional-fitness coaching platform. This paper describes practices, techniques and coaching. It is not therapy, treatment, diagnosis or medical advice.

SAFETY NOTE

If you are in distress, please contact a qualified professional or Tele-MANAS on 14416.