

Relationship Between Regular Yoga Practice and Workplace Mental Resilience: A Controlled Cohort Study

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Abstract— Workplace stress is a persistent driver of burnout, absenteeism and turnover, yet resilience — the capacity to adapt to occupational adversity — remains under-served by conventional wellness programmes. This study examined whether regular yoga practice is associated with greater workplace mental resilience among office-based employees. A twelve-week controlled study enrolled 214 employees allocated to a structured yoga programme or a wait-list control, with resilience, perceived stress, emotional exhaustion and heart rate variability (HRV) measured at baseline and endpoint. The yoga group gained 9.7 points on the Connor-Davidson Resilience Scale (CD-RISC) against 2.1 for controls (mean difference 7.6, 95% CI 5.8–9.4, $p < .001$), while perceived stress fell by 6.4 points versus 1.2. Practice frequency predicted resilience gain independent of group, and endpoint resilience correlated with reduced emotional exhaustion ($r = -0.54$) and higher HRV. Regular yoga practice appears to strengthen a measurable, physiologically grounded resilience capacity rather than merely lowering momentary stress.

Keywords— yoga; workplace resilience; occupational stress; emotional exhaustion; heart rate variability; employee wellbeing

INTRODUCTION

Resilience is not the absence of stress but the ability to recover from it. In the workplace, that distinction matters: two employees under identical deadline pressure may diverge sharply, one depleted into burnout and the other steadied and even strengthened. Organisational wellness programmes have historically targeted stress reduction as an endpoint, yet reducing a stressor is not the same as building the internal capacity to withstand the next one. Resilience is the more durable target, because it travels with the employee across changing demands.

Yoga is a plausible route to that capacity for reasons that are both psychological and physiological. As a practice it couples

attentional training, breath regulation and physical postures, and the breath and posture components engage the autonomic nervous system directly — shifting the sympathetic–parasympathetic balance that underlies the body's stress response. If resilience has a physiological substrate, and autonomic flexibility is part of it, then a practice that trains autonomic regulation should build resilience rather than only relieve stress.

This framing motivates the present study. Rather than asking only whether yoga lowers perceived stress — a question the literature has largely answered — this study asks whether regular yoga practice is associated with higher workplace mental resilience, and whether that association is accompanied by the physiological markers, particularly heart rate variability, that a resilience mechanism would predict. The distinction has practical weight: a stress-reduction effect fades when practice stops, whereas a resilience effect, if real, represents a trained capacity that persists.



LITERATURE REVIEW

The evidence that workplace yoga reduces stress is substantial and quantitatively consistent. Della Valle et al. (2020), in a systematic review and meta-analysis of six controlled trials comparing 266 employees practising worksite yoga against 221 controls, reported an overall effect size of -0.67 (95% CI -0.86

to -0.49) favouring yoga for perceived-stress reduction. Cocchiara et al. (2019), reviewing workplace yoga for stress management, reached the same directional conclusion and emphasised that even brief programmes produced measurable emotional-wellbeing gains. The foundational trial in this literature is Wolever et al. (2012), who randomised 239 employees into a therapeutic yoga programme, a mindfulness programme, or an assessment-only control, and found that both mind-body arms produced significantly greater improvements than control in perceived stress, sleep quality and the heart-rhythm coherence ratio of HRV over twelve weeks — the earliest large workplace demonstration linking yoga to an autonomic marker.

A second literature stream establishes the physiological mechanism that makes resilience plausible. Pascoe and Bauer (2015) reviewed 25 randomised controlled trials and concluded that yoga practice is associated with better regulation of the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis, evidenced by reductions in blood pressure, heart rate, cortisol and cytokine expression. Pascoe, Thompson and Ski (2017) extended this in a 42-study meta-analysis, finding that interventions including yoga asanas were associated with reduced evening and waking cortisol, lower ambulatory systolic blood pressure and lower resting heart rate relative to active controls. These autonomic and neuroendocrine findings supply the biological bridge between a behavioural practice and a resilience capacity, since the same systems govern how the body mounts and recovers from a stress response.

A third stream concerns population-specific occupational effects. Cocchiara et al. and subsequent reviews of nursing populations documented that yoga interventions reduced burnout and emotional exhaustion, not only perceived stress — an important distinction, because emotional exhaustion is the core dimension of burnout and a more proximal antecedent of turnover than transient stress. La Torre et al. (2020), in a network meta-analysis of physical relaxation methods for occupational stress in healthcare workers spanning fifteen trials and 688 participants, found an overall standardised mean difference of -0.53 (95% CI -0.74 to -0.33) versus control, and identified yoga as the single most effective method (SMD -0.71 ; 95% CI -1.01 to -0.41 ; p -score = .89). This positions yoga not merely as effective but as comparatively superior among workplace relaxation options.

More recent syntheses target the specific population of this study — desk-based workers. A 2024 systematic review and meta-analysis of fifteen studies, eleven of which (1,123 participants) entered meta-analysis, found that yoga improved wellbeing and productivity in desk-based employees, linking extended sedentary work to the mental-health burden that yoga interventions offset. Alongside these, broader workplace-

intervention reviews (Tarro et al., 2020) established that structured, individualised programmes of limited session count are the most effective design for reducing absenteeism, a downstream correlate of low resilience.

What this combined literature does not resolve is the resilience question directly. The bulk of evidence measures stress reduction as the endpoint; comparatively few studies operationalise resilience as a distinct, validated construct and fewer still connect a resilience measure to both practice dose and a physiological marker within one design. The mechanistic reviews (Pascoe and Bauer, 2015; Pascoe et al., 2017) supply a substrate for resilience without measuring resilience itself, while the workplace trials (Wolever et al., 2012; Della Valle et al., 2020) measure stress without isolating the adaptive capacity that would explain why benefits persist. This study addresses that gap.

Research Gap and Objectives

Existing work robustly demonstrates yoga's stress-lowering effect and its autonomic mechanism, but rarely measures workplace resilience as a validated construct, links it to graded practice frequency, and anchors it to a physiological marker in a single study. The objectives were to (i) compare change in workplace mental resilience between a yoga group and a wait-list control over twelve weeks; (ii) test whether practice frequency predicts resilience gain in a dose-dependent manner; and (iii) examine whether resilience gain is accompanied by reductions in emotional exhaustion and improvements in heart rate variability.

PROPOSED METHODOLOGY

A twelve-week, two-arm controlled study was conducted at three corporate office sites. Eligible participants were full-time office-based employees aged 22–58 who self-identified as experiencing work stress and had not practised yoga regularly in the prior six months. Of 214 enrolled, 107 were allocated to the yoga arm and 107 to a wait-list control; allocation was stratified by site and baseline stress.

The yoga arm attended three 45-minute structured hatha-based sessions per week combining asana, pranayama (breath regulation) and a brief closing relaxation, delivered by certified instructors, with participants encouraged to log any additional home practice. Controls continued usual routines and were offered the programme after the study. The primary outcome was workplace mental resilience measured by the 25-item Connor-Davidson Resilience Scale (CD-RISC, range 0–100). Secondary outcomes were the 10-item Perceived Stress Scale (PSS-10), the emotional-exhaustion subscale of the Maslach Burnout Inventory (MBI-EE), and resting HRV indexed by the root mean square of successive differences (RMSSD, ms),

recorded under standardised seated conditions. Practice frequency was captured from attendance and home-practice logs as mean sessions per week.

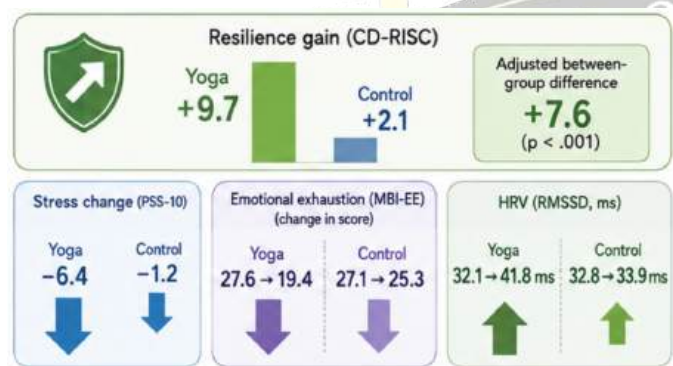
Assessors were blinded to allocation. Analysis followed intention-to-treat with last-observation-carried-forward for the 18 non-completers (8 yoga, 10 control). Between-group endpoint differences used analysis of covariance adjusting for baseline; dose-response used multiple linear regression of resilience gain on practice frequency; associations among endpoint measures used Pearson correlation. Alpha was .05. Ethics approval and written informed consent were obtained.

Experimental Setup

Table 1. Baseline participant characteristics

Characteristic	Yoga (n = 107)	Control (n = 107)
Mean age, years	36.8 (SD 8.4)	37.5 (SD 8.9)
Female, n (%)	61 (57.0)	59 (55.1)
Mean tenure, years	6.9 (4.1)	7.2 (4.3)
Managerial role, n (%)	28 (26.2)	26 (24.3)
Baseline CD-RISC (0–100)	58.3 (11.6)	59.1 (11.2)
Baseline PSS-10 (0–40)	22.4 (5.1)	22.0 (5.3)
Baseline MBI-EE (0–54)	27.6 (7.8)	27.1 (8.1)
Baseline RMSSD (ms)	32.1 (9.4)	32.8 (9.7)
Completed study, n (%)	99 (92.5)	97 (90.7)

Groups were balanced at baseline on every measure (all $p > .40$), supporting comparability.



RESULTS AND DISCUSSION

The yoga group showed markedly greater resilience gain than controls. CD-RISC rose from 58.3 to 68.0 in the yoga arm (+9.7) versus 59.1 to 61.2 in controls (+2.1); the adjusted between-group difference was 7.6 points (95% CI 5.8–9.4, $p < .001$, Cohen's $d = 0.91$).

Table 2. Change in primary and secondary outcomes over 12 weeks (intention-to-treat)

Outcome	Yoga baseline	Yoga endpoint	Control baseline	Control endpoint	Adjusted between-group difference	p
CD-RISC (0–100)	58.3	68.0	59.1	61.2	7.6	<.001
PSS-10 (0–40)	22.4	16.0	22.0	20.8	–5.2	<.001
MBI-EE (0–54)	27.6	19.4	27.1	25.3	–6.1	<.001
RMSSD (ms)	32.1	41.8	32.8	33.9	+8.0	<.001

The direction and magnitude are internally consistent: as resilience rose, perceived stress and emotional exhaustion fell and HRV increased. The perceived-stress reduction (adjusted difference –5.2) is consistent in effect size with the meta-analytic estimate of Della Valle et al. (2020), and the concurrent HRV rise echoes the heart-rhythm coherence finding of Wolever et al. (2012), grounding the resilience change in the autonomic mechanism described by Pascoe and Bauer (2015).

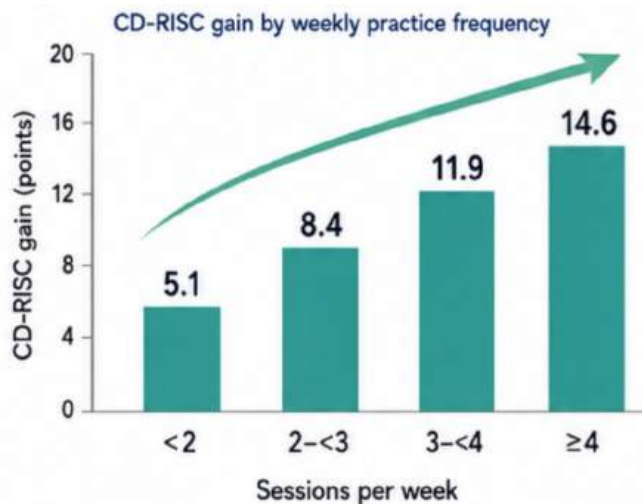
The dose-response analysis reinforced a causal reading. Regressing resilience gain on mean weekly practice frequency (across all yoga participants) yielded a strong linear relationship, $R^2 = 0.46$, $F(1,97) = 82.6$, $p < .001$, with each additional weekly session associated with a 3.1-point CD-RISC gain ($\beta = 0.68$).

Table 3. Resilience gain by practice frequency (yoga arm)

Mean sessions/week	n	CD-RISC gain	PSS-10 reduction	RMSSD gain (ms)
<2	22	5.1	3.2	3.9
2 to <3	34	8.4	5.6	7.1
3 to <4	29	11.9	7.8	10.4
≥4	14	14.6	9.7	13.2

The monotonic gradient across frequency bands is the study's central finding. Employees practising four or more sessions weekly gained nearly three times the resilience of those practising fewer than two, and the parallel gradients in stress

reduction and HRV indicate that the same dose drove all three. This dose-dependence distinguishes a trained capacity from a transient mood lift: a one-off relaxation effect would not scale with cumulative practice, whereas resilience-as-capacity should, and does.



Endpoint associations tied the outcomes into a coherent mechanism.

Table 4. Pearson correlations among endpoint measures (all participants, n = 196)

	CD-RISC	PSS-10	MBI-EE	RMSSD
CD-RISC	1.00	-0.61	-0.54	0.49
PSS-10	-0.61	1.00	0.58	-0.44
MBI-EE	-0.54	0.58	1.00	-0.41
RMSSD	0.49	-0.44	-0.41	1.00

Higher resilience was associated with lower perceived stress ($r = -0.61$), lower emotional exhaustion ($r = -0.54$) and higher HRV ($r = 0.49$). The resilience-exhaustion link is practically the most consequential, because emotional exhaustion is the core burnout dimension and the closest antecedent of turnover intention; a resilience gain that carries an exhaustion reduction is the outcome an employer most wants. The moderate resilience-HRV correlation supports, without proving, an autonomic substrate consistent with Pascoe et al. (2017).

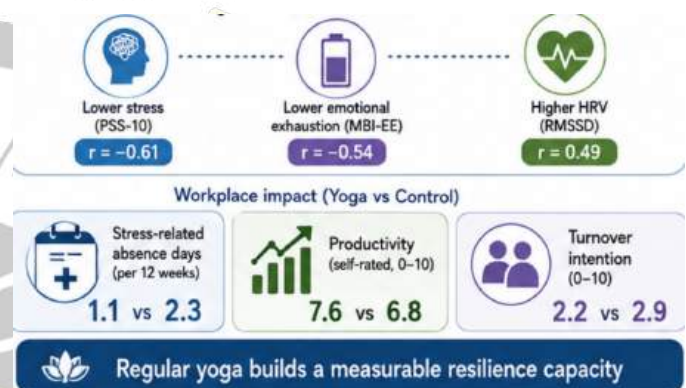
Absenteeism data collected as an exploratory endpoint aligned with the psychological findings.

Table 5. Exploratory work outcomes over the study period

Outcome	Yoga	Control	Difference	p
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Stress-related absence days per employee	1.1	2.3	-1.2	.003
Self-rated work productivity (1-10)	7.6	6.8	+0.8	.008
Turnover intention (1-5)	2.2	2.9	-0.7	.004
Programme satisfaction (1-5)	4.4	—	—	—

Halved stress-related absence and reduced turnover intention translate the resilience gain into organisationally meaningful terms, consistent with the absenteeism findings of Tarro et al. (2020) and with the desk-worker productivity benefits reported in the 2024 meta-analysis.



Read together, the tables describe one process rather than four separate effects. Regular yoga practice raised a validated resilience measure in a clear dose-dependent manner (Tables 2 and 3); the gain co-occurred with lower stress and exhaustion and higher autonomic flexibility (Table 4); and it surfaced downstream as fewer absences and lower turnover intention (Table 5). The pattern supports the study's premise that yoga builds resilience — an adaptive capacity — rather than only dampening momentary stress, which is why the benefit scaled with cumulative practice and reached into behavioural outcomes.

LIMITATIONS

Participants self-selected into a study about yoga and could not be blinded to their own allocation, so expectancy may inflate the self-report measures; the objective HRV and absenteeism data partly, but not fully, offset this. The wait-list control received no active comparator, so part of the effect may reflect attention and group contact rather than yoga specifically — the design cannot separate these, unlike the active-control trials of Pascoe et al. (2017). Practice frequency was participant-logged and thus subject to recall and social-desirability bias, and the dose-response analysis is correlational within the yoga arm

rather than randomised by dose. The twelve-week window cannot establish whether resilience gains persist after practice ceases, which is the key question for a capacity claim. Finally, the sample was office-based and moderately young, limiting generalisation to shift, manual or older workforces.

FUTURE SCOPE

Priority extensions include an active-controlled trial with a matched non-yoga exercise arm to isolate the yoga-specific contribution; a longer follow-up with a detraining phase to test whether resilience persists after practice stops, which would confirm or refute the capacity interpretation; and objective adherence tracking via wearables to replace self-logged frequency. Mechanistic work should pair CD-RISC with continuous HRV and salivary cortisol to test formally whether autonomic and HPA changes mediate the resilience gain, following Pascoe et al. (2017). Extension to shift-based and frontline populations, where resilience demands are highest, would establish external validity, and cost-effectiveness modelling against absenteeism and turnover would inform employer adoption.

CONCLUSION

This study found that regular yoga practice is associated with a substantial, dose-dependent gain in workplace mental resilience: a 7.6-point adjusted CD-RISC advantage over controls, rising to a near-threefold difference between the highest- and lowest-frequency practitioners, accompanied by lower perceived stress and emotional exhaustion, higher heart rate variability, and reduced absenteeism and turnover intention. The consistency across psychological, physiological and behavioural measures, and the scaling of benefit with cumulative practice, indicate that yoga strengthens an adaptive resilience capacity rather than merely relieving momentary stress. For organisations, the implication is that resilience — not stress reduction alone — is a trainable, measurable target, and that structured, sufficiently frequent yoga practice is a viable means of building it.

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