

Yoga and Ayurvedic Lifestyle Practices for Sleep, Stress Management and Psychological Well-being: A Literature-Based Review

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Abstract

Background. Disturbed sleep, chronic psychological stress and diminished well-being have become interlinked features of contemporary lifestyles, and interest in behavioural, non-pharmacological approaches has grown accordingly. Yoga and Ayurvedic lifestyle practices are widely promoted for these concerns, but the evidence supporting each differs markedly in quality.

Objective. To synthesise published literature on Yoga and Ayurvedic lifestyle practices in relation to sleep, stress and psychological well-being, and to distinguish established evidence from traditional concepts and proposed mechanisms.

Method. This is a literature-based narrative review. PubMed/MEDLINE, Scopus, Web of Science, ScienceDirect, the Cochrane Library and AYUSH-related sources were searched for systematic reviews, meta-analyses, randomised controlled trials and observational studies. Classical Ayurvedic texts were consulted to define concepts, not to evidence effects.

Findings. Meta-analytic evidence supports modest improvements in sleep quality and reductions in perceived stress and elevated anxiety following Yoga, together with a shift in autonomic balance toward parasympathetic predominance. Yoga Nidra shows the most specific sleep evidence, including objective polysomnographic change. Evidence for Ayurvedic lifestyle concepts such as *Dinacharya*, *Nidra*, *Ahara* and *Sadvritta* remains largely conceptual, though individual procedures such as *Shirodhara* have preliminary controlled support.

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Research gap. Almost no studies evaluate Yoga and Ayurvedic lifestyle as an integrated protocol, and standardised Ayurvedic lifestyle interventions are lacking.

Conclusion. Yoga may contribute meaningfully to sleep and stress management; Ayurvedic lifestyle practices offer a coherent behavioural framework whose independent effects require investigation.

Keywords: Yoga; Ayurveda; *Dinacharya*; sleep quality; psychological stress; psychological well-being; lifestyle intervention

1. Introduction

Contemporary living has generated a distinctive cluster of health challenges. Sedentary occupations, extended screen exposure, irregular meal and sleep timing, competitive academic and workplace environments, and continuous digital connectivity have combined to disturb the behavioural rhythms on which physiological regulation depends. Non-communicable disease burden has risen alongside these changes, and increasingly the proximate drivers are behavioural rather than infectious or genetic.

Sleep has been among the most visible casualties. Insufficient duration, delayed timing and fragmented sleep are now common across age groups and are no longer confined to clinical insomnia populations. Consequences extend beyond daytime sleepiness to impaired attention and working memory, emotional dysregulation, metabolic disturbance and reduced quality of life. Sleep quality is most commonly assessed with the Pittsburgh Sleep Quality Index (Buysse et al., 1989) and insomnia severity with the Insomnia Severity Index, whose divergence in trial results, discussed below, has interpretive consequences.

Psychological stress is the second element. Stress is best understood as a three-part process comprising the stressor, the physiological response, and the appraisal that demands exceed available resources (Lazarus & Folkman, 1984). The response is adaptive; pathology arises when activation is excessive, prolonged or fails to terminate, producing the cumulative cost McEwen (1998) termed *allostatic load*. The principal effectors are the sympathetic–adrenomedullary axis and the hypothalamic–pituitary–adrenal (HPA) axis (Chrousos, 2009). Vagally mediated heart-rate variability (HRV) indexes the counter-regulatory capacity opposing both (Task Force, 1996) and is linked to prefrontal control over subcortical threat circuitry (Thayer & Lane, 2000).

Anxiety and other emotional difficulties frequently accompany both. Importantly, the relationships among sleep, stress and mental health are bidirectional

rather than linear. Stress delays sleep onset and fragments sleep architecture; insufficient sleep in turn amplifies next-day emotional reactivity and HPA activation; and both contribute to, and are worsened by, anxiety and depressive symptoms. This circularity has two implications for the present review. First, an intervention that acts at any point in the cycle may produce change at the others, which makes single-outcome trials difficult to interpret. Second, causal claims in this literature must be made with unusual care, since cross-sectional associations are almost always compatible with reverse causation.

Psychological well-being more than the absence of distress, encompassing positive affect, life satisfaction and perceived capacity to cope is the endpoint toward which such interventions are ultimately directed, yet it is measured least consistently and frequently omitted in favour of narrower symptom scales.

Against this background, interest in Yoga and Ayurveda as lifestyle-based approaches has grown substantially. Their appeal is intelligible: both are behavioural rather than pharmacological, address multiple elements of the cluster simultaneously, are low-cost and scalable, and frame health as maintained through daily conduct rather than restored through episodic treatment. Ayurveda in particular offers an elaborated system of daily regimen (*Dinacharya*), diet (*Ahara*), sleep guidance (*Nidra*) and conduct (*Sadvritta*) that maps closely onto what health psychology calls lifestyle and behavioural regulation.

2. Ayurvedic Lifestyle and Health

Ayurveda locates health maintenance (*svasthavritta*) primarily in daily conduct rather than in therapeutics. Four concepts are directly relevant to sleep, stress and well-being. Each is presented here as a traditional concept; the evidential status of each is stated separately.

2.1 *Dinacharya* (daily routine)

Dinacharya prescribes a structured sequence of daily activity anchored to the solar cycle: rising in the pre-dawn period (*Brahma Muhurta*), oral and nasal hygiene, oil massage (*Abhyanga*), physical exercise (*Vyayama*), bathing, and regulated meal and sleep timing (Rai et al., 2022). Classical sources for these prescriptions include *Charaka Samhita* and *Ashtanga Hridaya*.

The correspondence with modern chronobiology is notable: *Dinacharya* is in effect a prescription for circadian entrainment through consistent light exposure,

activity and meal timing precisely the variables sleep science identifies as determinants of circadian stability. This is a conceptual convergence, not evidence of efficacy. Reviews of *Dinacharya* to date have been narrative and themselves conclude that prospective randomised trials are still required (Rai et al., 2022).

2.2 Nidra (sleep)

Ayurveda accords sleep the status of one of the three pillars (*trayopastambha*) of health, alongside diet and regulated conduct. Classical texts describe sleep as governed by *Kapha* and *Tamas*, address both insufficient and excessive sleep as pathological, discourage daytime sleep in most seasons and constitutions, and link disturbed sleep to *Vata* aggravation. Contemporary sleep-hygiene guidance overlaps substantially with these recommendations consistency of timing, avoidance of stimulation before bed, and moderation of daytime napping again by convergence rather than derivation.

2.3 Ahara (dietary practice)

Ayurvedic dietary guidance concerns not only what is eaten but when and how: regular meal timing, the principal meal at midday when digestive capacity (*agni*) is considered strongest, eating in a settled state, and avoiding food before sleep. The emphasis on meal *timing* rather than composition alone anticipates current interest in chrononutrition. Direct evidence linking Ayurvedic dietary practice to sleep or stress outcomes is not available.

2.4 Sadvritta (healthy conduct)

Sadvritta prescribes ethical and behavioural regulation truthfulness, restraint of anger and impulse, respectful social conduct, and cultivation of equanimity. Functionally, this is a code of emotional and interpersonal self-regulation. It has close conceptual parallels with contemporary constructs of emotion regulation and prosocial behaviour, both of which have established associations with psychological well-being. No study has operationalised *Sadvritta* as a measurable intervention.

2.5 Prakriti (constitution), briefly

Ayurveda holds that lifestyle prescriptions should be individualised to constitutional type. There is a genuine biological literature here: differences between extreme constitutional types have been reported in genome-wide expression and biochemistry (Prasher et al., 2008) and in genome-wide SNP distribution (Govindaraj et al., 2015). However, a critical review of 64 constitutional assessment tools developed to

2024 found that only two met most criteria of a standard scale-validation framework (Venkatesh et al., 2025). *Prakriti*-based individualisation is therefore a promising but currently unvalidated route to personalising lifestyle advice, and is not developed further here.

2.6 Evidence for Ayurvedic procedures

Where discrete Ayurvedic procedures have been tested, preliminary controlled evidence exists. *Shirodhara* (oil-dripping on the forehead) reduced state anxiety and produced significant decreases in plasma noradrenaline and urinary serotonin excretion relative to a supine control condition in healthy women (Uebaba et al., 2008). *Abhyanga* has been examined in a small pilot study of subjective stress experience (Basler, 2011). These are procedures rather than lifestyle practices, and the distinction matters: a procedure administered by a practitioner is not the same intervention as a self-maintained daily regimen.

Summary of evidential status. *Dinacharya*, *Nidra*, *Ahara* and *Sadvritta* are coherent, internally consistent behavioural frameworks with plausible correspondences to circadian science, sleep hygiene, chrono nutrition and emotion regulation respectively. None has been tested as a standardised intervention in a controlled trial with sleep, stress or well-being outcomes. They should be described as traditional lifestyle frameworks of emerging scientific interest, not as evidence-based interventions.

3. Yoga, Sleep and Stress

3.1 Yoga and sleep

Yoga Nidra provides the most specific and methodologically interesting sleep evidence. In a randomised parallel-design trial, 41 patients with chronic insomnia received either cognitive behavioural therapy for insomnia ($n = 20$) or Yoga Nidra ($n = 21$), with both subjective sleep diaries and objective polysomnography. Yoga Nidra produced marked improvement in N2 and N3 percentage of total sleep time, improved total wake duration and subjective sleep quality, and a statistically significant reduction in salivary cortisol ($p = .041$) (Datta et al., 2021). Subsequent electrophysiological work has examined local sleep phenomena during the practice itself (Datta et al., 2022). This combination of objective sleep architecture change plus a neuroendocrine marker is uncommon in the yoga literature and makes Yoga Nidra the most defensible single practice for sleep outcomes.

Against this, a large four-arm randomised trial of online Yoga Nidra ($n = 362$) found improvements versus waitlist with very small effect sizes ($d = 0.08\text{--}0.16$) and, against an active music control, a significant advantage only for depression ($d = 0.13$), though regular practice was associated with lower total cortisol and steeper diurnal slopes (Moszeik et al., 2025). The discrepancy with Datta et al. is instructive: supervised practice in a clinical insomnia population appears to yield larger effects than unsupervised online practice in a general population.

3.2 Yoga and stress

A systematic review of randomised controlled trials supported the benefit of Yoga on stress measures and mood (Pascoe & Bauer, 2015). A subsequent meta-analysis restricted to trials with active comparators, a design requirement that excludes weaker studies and controls for attention and general physical activity, reported reductions in cortisol, systolic blood pressure and heart rate, and improvement in HRV (Pascoe et al., 2017).

For anxiety, a systematic review and meta-analysis concluded that Yoga may be effective and safe for individuals with elevated anxiety, while finding the evidence inconclusive for diagnosed anxiety disorders (Cramer et al., 2018). This distinction is frequently lost in secondary citation and should be preserved.

For autonomic outcomes, a comprehensive review found that Yoga increases HRV and vagal dominance during practice, and that regular practitioners show higher resting vagal tone than non-practitioners (Tyagi & Cohen, 2016). The same review flags a methodological caution that is under-applied across the field: because high-frequency HRV is respiration-dependent and yogic practices deliberately alter respiratory rate, apparent HRV increases during practice may partly reflect respiratory mechanics rather than change in underlying vagal tone.

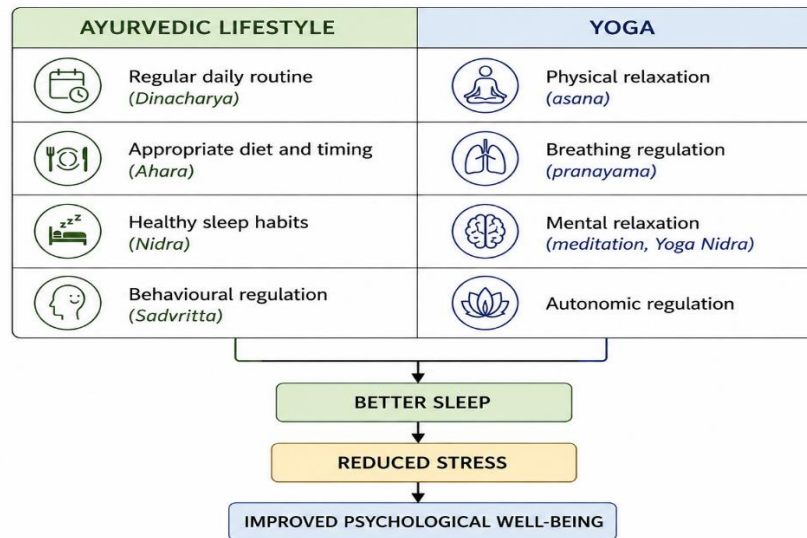
3.3 Mechanisms, briefly

The most robustly supported mechanism is respiratory. Slow breathing below approximately ten breaths per minute consistently increases HRV and respiratory sinus arrhythmia and shifts electroencephalographic activity toward alpha and theta bands, with associated psychological benefit in healthy participants (Zaccaro et al., 2018). Slow pranayama specifically reduced perceived stress and improved cardiovascular parameters in healthcare students (Sharma et al., 2013). Additional proposed pathways vagal–GABAergic modulation (Streeter et al., 2012), interoceptive recalibration, and emotion-regulation training remain preliminary or theoretical.

4. Integrated Yoga–Ayurveda Approach

This section sets out the conceptual case for integration, and states plainly how much of it is evidenced.

4.1 The proposed model



4.2 Ayurvedic lifestyle practice operates on the temporal architecture of behaviour. *Dinacharya* regulates *when* things happen waking, eating, activity, sleeping. Its proposed mechanism is circadian entrainment and behavioural consistency, and its effects, if real, would be slow, cumulative and preventive.

Yoga operates on acute physiological state. Asana, pranayama and Yoga Nidra produce measurable within-session change in autonomic balance, and repeated practice may shift resting tone. Its effects are relatively rapid and directly measurable.

A person practising Yoga daily at irregular times, sleeping erratically and eating late has an intervention acting against an unfavourable behavioural background. Conversely, a well-regulated routine without any active down-regulation practice provides structure but no acute mechanism for reducing arousal. On this reasoning, the two address different levels of the same problem one the scaffolding, the other the state and might reasonably be expected to combine additively.

4.3 What is actually evidenced

Very little. The most relevant study located is a feasibility and pilot efficacy trial combining Yoga with *Shirodhara* in adults with anxiety disorder, which reported improvement in sleep quality in both groups from baseline but no statistically

significant between-group differences, with the authors themselves noting the small sample and recommending a four-arm design (Yoga alone, Ayurveda alone, combined, control) to establish synergy (Bhargav et al., 2019). That recommended design has not, to the author's knowledge, been executed.

It must also be noted that this study combined Yoga with an Ayurvedic procedure, not with an Ayurvedic lifestyle regimen. No identified study has tested a standardised *Dinacharya*-based lifestyle protocol alongside Yoga with sleep, stress and well-being outcomes.

4.4 Potential roles, appropriately hedged

An integrated approach may plausibly contribute to preventive health (both are low-risk and suited to asymptomatic populations), lifestyle modification (Ayurveda supplies a structured behavioural framework that generic advice lacks), sleep health, stress management and quality of life. Each of these is a reasonable expectation derived from the separate evidence bases. None has been demonstrated for the integrated approach, and the distinction between "plausible" and "demonstrated" should be maintained in any clinical or policy recommendation.

5. Current Social Relevance

The behavioural profile these practices address is now widespread. Pre-sleep screen exposure delays sleep onset and displaces duration; sedentary work reduces the activity input supporting sleep pressure and mood; academic and workplace stress are consistently associated with disturbed sleep; and irregular sleep and meal timing driven by shift work and social scheduling disrupt circadian stability. Mental-health service demand exceeds supply in most settings, particularly for sub-threshold distress that impairs functioning without meeting diagnostic criteria.

Yoga and Ayurvedic lifestyle practice are relevant to this profile for reasons that are structural as much as therapeutic. Both are behavioural and self-administered, and therefore scalable without proportionate workforce expansion. Both are preventive in orientation, targeting the sub-clinical population that formal services cannot absorb. Both are culturally embedded in South Asian populations, which may support adherence in ways that imported interventions do not. And both are framed as daily conduct rather than treatment, which suits conditions arising from habit rather than pathology.

These are arguments for investigating and, cautiously, for offering such

practices as health-promoting behaviour. They are not arguments for treating them as established therapies, and public health messaging should not conflate the two.

6. Table

Table 1. Summary of evidence on Yoga and Ayurvedic lifestyle practices for sleep, stress and psychological well-being.

Intervention/ Practice	Target Outcome	Evidence / Findings	Major Limitation
Yoga (composite), women with sleep problems (Wang et al., 2020)	Sleep quality; insomnia severity	Meta-analysis, 19 studies, $n = 1,832$: overall sleep improvement $SMD = -0.33$; PSQI $SMD = -0.54$ in 16 RCTs	No effect on ISI (3 RCTs) or in breast-cancer populations (7 RCTs); women only
Exercise including mind–body modalities (Xie et al., 2021)	Sleep quality	Meta-analysis of 22 RCTs; mind–body and conventional exercise improved subjective sleep to similar extent	Cannot separate Yoga-specific from general activity effects
Yoga Nidra, chronic insomnia (Datta et al., 2021)	Sleep architecture; cortisol	RCT, $n = 41$ (vs CBT-I): improved N2/N3 % of total sleep time, total wake duration, subjective quality; salivary cortisol reduced ($p = .041$)	Small sample; PSG repeated only in volunteers; single centre
Yoga Nidra, online (Moszeik et al., 2025)	Stress, anxiety, depression, sleep, diurnal cortisol	4-arm RCT, $n = 362$: benefit vs waitlist $d = 0.08–0.16$; vs active control only depression ($d = 0.13$)	Very small effect sizes; unsupervised delivery; self-report adherence
Yoga (composite) vs active controls (Pascoe et al., 2017)	Cortisol, blood pressure, heart rate, HRV	Meta-analysis of RCTs: reductions in cortisol, systolic BP, heart rate; improved HRV	Heterogeneous protocols; cortisol findings inconsistent elsewhere
Yoga (Pascoe & Bauer, 2015)	Perceived stress; mood	Systematic review of RCTs: support for benefit on stress and mood	Variable trial quality; few active comparators
Yoga (Cramer et al., 2018)	Anxiety	Meta-analysis: effective and safe for elevated anxiety	Inconclusive for diagnosed anxiety disorders

Yoga (Tyagi & Cohen, 2016)	Heart-rate variability	Systematic review: increased HRV and vagal dominance during practice; higher resting vagal tone in practitioners	Respiratory confounding of HF-HRV rarely controlled
Slow breathing / pranayama (Zaccaro et al., 2018)	Autonomic and cortical activity; psychological state	Systematic review: slow breathing (<10 breaths/min) increases HRV and RSA, shifts EEG to alpha/theta	Healthy participants; acute effects; heterogeneous techniques
Slow vs fast pranayama (Sharma et al., 2013)	Perceived stress; cardiovascular parameters	Slow pranayama reduced perceived stress and improved cardiovascular parameters	Single population (healthcare students); no active control
<i>Shirodhara</i> (Uebaba et al., 2008)	State anxiety; sympathetic markers	Controlled study, healthy women: reduced state anxiety; significant decreases in plasma noradrenaline and urinary serotonin vs control	Small samples; acute single-session; healthy females only
<i>Abhyanga</i> (Basler, 2011)	Subjective stress	Pilot, $n = 20$: single-session effect on subjective stress experience, HR and BP	Pilot; no control group; single dose
Yoga + <i>Shirodhara</i> , anxiety disorder (Bhargav et al., 2019)	Anxiety symptoms; cognition; sleep quality	Feasibility/pilot: improvement in both groups from baseline; no significant between-group difference	Small sample; no four-arm design; feasibility endpoint
<i>Dinacharya</i> (Rai et al., 2022)	Lifestyle disorders; preventive health	Narrative/conceptual review: correspondence with circadian and metabolic science	No controlled trial; authors themselves call for prospective RCTs

7. Discussion

Current literature offers cautiously positive but uneven support for yoga's role in sleep and stress regulation. Across general populations, yoga is associated with modest gains in subjective sleep quality, reflected in small-to-moderate effect sizes, though this benefit does not reliably transfer to insomnia severity scores or to clinical groups such as breast cancer patients, indicating that outcome measure and population substantially shape detectable effects (Wang et al., 2020). Among specific protocols, Yoga Nidra

shows the most compelling evidence, with supervised trials demonstrating genuine polysomnographic changes in sleep architecture alongside reductions in salivary cortisol among individuals with chronic insomnia (Datta et al., 2021); notably, a large-scale unsupervised digital version of the same practice yielded only negligible benefits (Moszeik et al., 2025), underscoring that therapeutic supervision, rather than the technique alone, may drive efficacy. With respect to stress, yoga demonstrates moderate-confidence reductions in perceived stress and subclinical anxiety, accompanied by measurable physiological shifts lower cortisol, blood pressure, and heart rate relative to active control conditions (Pascoe et al., 2017); however, its value for formally diagnosed anxiety disorders remains unresolved (Cramer et al., 2018), and effect magnitudes across studies stay modest, positioning yoga as a supportive rather than transformative stress-management tool. Evidence for Ayurvedic lifestyle interventions is considerably thinner. Isolated procedures like Shirodhara have preliminary controlled backing for anxiety and neuroendocrine outcomes (Uebaba et al., 2008), and Abhyanga has only pilot-level data (Basler, 2011), while broader constructs Dinacharya, Nidra, Ahara, and Sadvritta remain theoretically aligned with circadian and sleep-hygiene science but lack rigorous empirical validation, a gap reviewer themselves acknowledge (Rai et al., 2022). Because sleep, stress, and well-being interact bidirectionally, single-outcome trial designs struggle to isolate causal mechanisms, and cross-sectional associations remain vulnerable to reverse causation. The prospect of combining yoga and Ayurveda as complementary practices pairing behavioural-temporal structuring with acute physiological regulation is conceptually appealing yet essentially untested empirically, with the sole combined trial finding no significant between-group difference and explicitly calling for a four-arm design (Bhargav et al., 2019). Overall, the evidence base is strongest for yoga's general effects on subjective sleep and stress, more provisional for Yoga Nidra and Shirodhara, and largely hypothesis-generating for broader Ayurvedic constructs, further complicated by inconsistent outcome measures and poorly standardized intervention definitions across studies.

Acknowledgments: We would like to thank the Indian Council of Social Science Research (ICSSR) for financing research fellowships, particularly the doctoral fellowship (ICSSR/RFD/24-25/HLTH) given to Mohit Kumar in February 2025.

Funding sources: N/A

Disclosure of Interests: No.

7. Conclusion

Emerging evidence indicates that Yoga may contribute to improved sleep quality and reduced perceived stress and anxiety, with effect sizes that are modest rather than large, and with benefit more consistently demonstrated in general than in clinical populations. Among specific practices, Yoga Nidra suggests a particular potential role, being the only practice reviewed here with both objective sleep-architecture change and a neuroendocrine marker in a randomised trial, although this finding requires replication in larger supervised samples. Ayurvedic lifestyle practices *Dinacharya*, *Nidra*, *Ahara* and *Sadvritta* constitute a coherent and internally consistent behavioural framework whose correspondences with circadian science, sleep hygiene and emotion regulation are striking. These correspondences are conceptual, however, and do not by themselves constitute evidence of efficacy. Discrete Ayurvedic procedures such as *Shirodhara* have preliminary controlled support, but a procedure is not a lifestyle regimen, and the lifestyle concepts themselves await controlled evaluation.

An integrated approach is theoretically attractive, since the two traditions plausibly address different levels of the same problem behavioural timing and structure on one hand, acute physiological regulation on the other. This potential complementarity requires further investigation rather than assertion; the one available combined study found no significant between-group advantage.

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