

Efficacy of Herbal Poultice Pack in Improving Sleep Quality among Primary School Teachers with Insomnia: A Pilot Study

Dr Deepa C Patil ¹, Prof Kavya Vijayan ²

¹ Professor, Department of Kayachikista, JSS Ayurveda Medical College, Mysuru.

² Assistant Professor, Department of Psychology, Centre for distance Education and Virtual learning Jain (deemed to be university) Bengaluru.

DOI: <https://doi.org/10.51583/IJLTEMAS.2025.1409000056>

Abstract

Background: Insomnia is one of the most common sleep disorders, affecting nearly one-third of adults worldwide, with significant consequences for health and occupational performance. Teachers represent a vulnerable group due to occupational stress and workload. This study evaluated the efficacy of a standardized herbal poultice pack, prepared with Ksheerbala taila, in improving insomnia severity and sleep quality among primary school teachers.

Methods: A pre–post study was conducted among 20 teachers in Mysore with insomnia. Participants applied a herbal poultice pack nightly for 30 days. Validated tools including the Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS), and Regensburg Insomnia Scale (RIS) were used. Data were analyzed using paired t-tests, Wilcoxon signed-rank tests, and effect size measures.

Results: Significant improvements were observed in ISI ($p < 0.001$), PSQI ($p < 0.01$), PSS ($p < 0.001$), and RIS ($p = 0.001$). Improvements were most evident in sleep duration, disturbance reduction, and daytime functioning. No adverse effects were reported.

Conclusion: Herbal poultice packs are effective, safe, and culturally relevant for improving sleep quality in teachers. Larger controlled trials are recommended to validate findings.

Keywords: Insomnia, Herbal poultice, Ksheerbala taila, Sleep quality, Teachers, Stress

I. Introduction

Sleep is a fundamental biological process essential for maintaining physical restoration, emotional regulation, and optimal cognitive functioning. Despite its importance, sleep disturbances are increasingly prevalent in modern society, with insomnia emerging as one of the most common disorders. Insomnia is characterized by difficulty in initiating or maintaining sleep, early morning awakenings, or non-restorative sleep, despite adequate opportunity to rest. Chronic insomnia not only impairs daytime functioning but also increases the risk of psychiatric disorders, cardiovascular disease, diabetes, and reduced occupational efficiency.

Globally, population-based studies estimate that nearly 30–35% of adults experience insomnia symptoms, while 10–15% suffer from chronic insomnia disorder associated with daytime impairment. In India, studies suggest prevalence rates ranging from 20% to 33% among adults, with higher rates observed in urban populations exposed to occupational stress, irregular work schedules, and lifestyle-related risk factors. Teachers, particularly those working in primary schools, represent a high-risk occupational group. Teaching is a cognitively demanding profession that requires sustained attention, emotional regulation, and interpersonal engagement. Excessive workload, classroom management challenges, and administrative responsibilities compound stress levels, predisposing teachers to sleep disturbances and associated mental health issues.

The consequences of insomnia among teachers extend beyond personal well-being to affect professional performance and student outcomes. Teachers with poor sleep quality often report fatigue, irritability, reduced concentration, and lower energy levels. These impairments can compromise classroom effectiveness, increase absenteeism, and contribute to burnout. Stress-related sleep disturbances also increase the risk of depression and anxiety, creating a vicious cycle that undermines both individual and institutional productivity. A study by Gluschkoff et al. (2016) highlighted that poor sleep among teachers was strongly associated with depressive symptoms, while Geddam et al. (2023) emphasized workload, administrative pressures, and financial stressors as salient contributors to psychological distress among Indian teachers.

Pharmacological treatments for insomnia, such as benzodiazepines and non-benzodiazepine hypnotics, are effective in the short term but have limitations including tolerance, dependence, cognitive impairment, and residual daytime sedation. Consequently, non-pharmacological therapies have gained attention as safer alternatives. Cognitive behavioral therapy for insomnia (CBT-I) is considered the gold standard but requires specialized training and resources, limiting its accessibility in many low-resource settings. Complementary therapies, including herbal medicine, aromatherapy, massage, and poultice application, are increasingly explored as culturally relevant, affordable, and patient-friendly interventions.

Herbal poultice therapy involves the topical application of herbal formulations, traditionally prepared with oils and plant extracts, to specific body regions. These formulations exert both thermal and pharmacological effects. The warmth promotes peripheral

vasodilation, muscle relaxation, and parasympathetic activation, while the phytoconstituents may influence central neurotransmitter pathways such as gamma-aminobutyric acid (GABA) and serotonin, both of which regulate sleep. Specifically, Ksheerbala taila, an Ayurvedic preparation containing *Sida cordifolia*, cow's milk, and sesame oil, is known for its sedative, anxiolytic, and neuroprotective properties. Previous research in Ayurveda and integrative medicine has suggested that herbal poultice applications can reduce stress, alleviate pain, and promote relaxation, but empirical evidence in relation to insomnia is limited.

In this context, the present study investigates the efficacy of a standardized herbal poultice pack in reducing insomnia severity and improving sleep quality among primary school teachers. By targeting a high-risk occupational group, this research contributes to the growing body of evidence on safe, cost-effective, and culturally appropriate interventions for sleep disorders.

Objectives of the study:

1. To assess the impact of insomnia on work performance, mental health, and quality of life among primary school teachers.
2. To evaluate the effect of herbal poultice pack therapy on insomnia severity and sleep quality.
3. To compare pre- and post-intervention outcomes using validated scales.
4. To explore the overall impact of herbal poultice therapy on physical and mental well-being.

II. Methods**Study Design**

A pre–post experimental study design without a control group was employed to evaluate the effect of herbal poultice pack therapy on insomnia among primary school teachers. The design was chosen to allow each participant to serve as their own control, thereby minimizing inter-individual variability in sleep patterns.

Study Setting and Duration

The study was conducted in Mysore, Karnataka, India, between July and August 2023. The intervention lasted 30 consecutive days, during which participants applied the herbal poultice pack each night before sleep.

Participants**Inclusion Criteria**

- Primary school teachers aged between 25 and 50 years.
- Self-reported insomnia symptoms persisting for at least one month.
- Willingness to participate in the intervention and complete pre- and post-assessments.
- Not currently using pharmacological sleep medication.

Exclusion Criteria

- Chronic medical conditions known to affect sleep (e.g., obstructive sleep apnea, epilepsy, major psychiatric disorders).
- Pregnant or lactating women.
- Participants already undergoing alternative therapies for sleep.
- Use of sedative or hypnotic medication during the study period.

Sample Size and Sampling Method

A total of 20 participants were recruited through convenience and random sampling from schools in Mysore. The relatively small sample size reflects the pilot nature of the study. All participants completed the intervention and follow-up assessments, resulting in no dropouts.

Intervention: Herbal Poultice Pack

The intervention involved the use of a standardized herbal poultice pack prepared with **Ksheerbala taila**, a traditional Ayurvedic oil formulation.

Composition:

- *Sida cordifolia* (Bala) extract
- Cow's milk
- Sesame oil (Tila taila)

Method of Application:

- A sterile gauze cloth was soaked in warm Ksheerbala taila.
- The gauze was gently tied around the scalp region (parietal and occipital area) and secured in place.
- The poultice was applied nightly for 6–7 hours during sleep.
- Participants were instructed to ensure proper temperature to avoid burns and to remove the poultice in the morning.

Duration:

- Once daily, every night for 30 consecutive days.

Safety Monitoring:

- Participants were advised to report adverse events such as skin irritation, headache, or dizziness.
- No adverse effects were reported during the study.

Data Collection Tools

Four validated instruments were used:

1. **Insomnia Severity Index (ISI)**
 - Seven-item scale assessing sleep onset, maintenance, early awakening, dissatisfaction, interference with functioning, noticeability, and distress.
 - Scores: 0–7 (no insomnia), 8–14 (subthreshold), 15–21 (moderate), 22–28 (severe).
2. **Pittsburgh Sleep Quality Index (PSQI)**
 - Nineteen-item scale covering seven domains: subjective sleep quality, latency, duration, efficiency, disturbances, medication use, and daytime dysfunction.
 - Global score >5 indicates poor sleep quality.
3. **Perceived Stress Scale (PSS)**
 - Ten-item self-report tool assessing perceived stress over the past month.
 - Scores range: 0–13 (low), 14–26 (moderate), 27–40 (high).
4. **Regensburg Insomnia Scale (RIS)**
 - Designed to evaluate subjective insomnia severity across mild, moderate, and severe categories.
 - Useful for capturing psychological aspects of insomnia.

Data Collection Procedure

At baseline, participants completed demographic questionnaires (age, gender, education, teaching experience, workload, family responsibilities, socioeconomic status) along with ISI, PSQI, PSS, and RIS. Following the 30-day intervention, the same instruments were re-administered.

Data collection was performed both online and offline depending on participant preference. Compliance was monitored through self-report diaries where participants recorded nightly application of the poultice.

Ethical Considerations

- Ethical clearance was obtained from the Institutional Ethics Committee of Jain University.
- Written informed consent was collected from all participants prior to recruitment.
- Confidentiality of data was maintained by anonymizing responses and storing records securely.
- Participants retained the right to withdraw from the study at any time without penalty.

Data Analysis

Data were analyzed using **SPSS software (version 26.0)**.

- **Descriptive statistics** (mean, standard deviation, percentages) were used to summarize demographic and baseline characteristics.

- **Paired t-tests** were conducted to assess differences in pre- and post-intervention scores for normally distributed data.
- **Wilcoxon signed-rank tests** were employed for non-normally distributed variables.
- **Effect sizes** (Cohen's d) were calculated to evaluate the magnitude of intervention effects.
- A p-value of <0.05 was considered statistically significant.

III. Results

Participant Characteristics

All 20 participants completed the study, resulting in a 100% retention rate. The demographic distribution is shown in **Table 1**.

Table 1. Demographic characteristics of participants (N = 20)

Variable	Category	n	%
Age (years)	20–29	5	25%
	30–39	10	50%
	40–49	5	25%
Gender	Male	6	30%
	Female	14	70%
Education	Degree	6	30%
	Master's degree	3	15%
	B.Ed.	10	50%
	Degree + B.Ed.	1	5%
Socioeconomic status	Middle class	20	100%
Teaching experience (years)	1–5	10	50%
	6–10	8	40%
	11–15	2	10%
Workload (hours/day)	6	8	40%
	7	12	60%
Family responsibility	Household + caregiving	5	25%
	All responsibilities	15	75%

The majority of participants were **female teachers (70%)**, aged between **30–39 years (50%)**, holding a **B.Ed. qualification (50%)**, and belonging to the **middle-class socioeconomic group (100%)**. Most teachers reported **1–5 years of teaching experience (50%)** and an average **workload of 7 hours/day (60%)**. Family responsibilities were high, with **75% managing multiple roles** including household, caregiving, and financial duties.

Insomnia Severity Index (ISI)

At baseline, **15 participants (75%)** had clinically significant insomnia (mild, moderate, or severe). After the 30-day intervention, ISI scores improved markedly (Table 2).

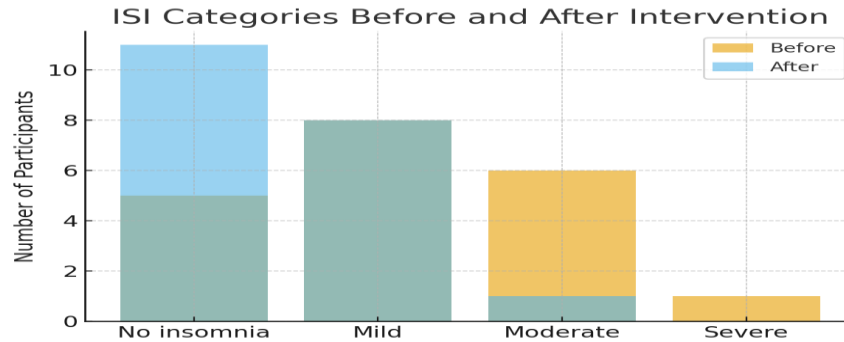
Table 2. ISI categories before and after intervention

ISI Category	Before (n)	After (n)
No insomnia (0–7)	5	11
Mild (8–14)	8	8
Moderate (15–21)	6	1
Severe (22–28)	1	0

Statistical tests indicated a **highly significant reduction** in ISI scores:

- Paired t-test: $t = 5.36$, $p = 3.6 \times 10^{-5}$
- Wilcoxon signed-rank test: $W = 0.0$, $p = 0.00093$

This demonstrates a **clinically meaningful improvement**, with many participants shifting from moderate/severe insomnia to mild/no insomnia.



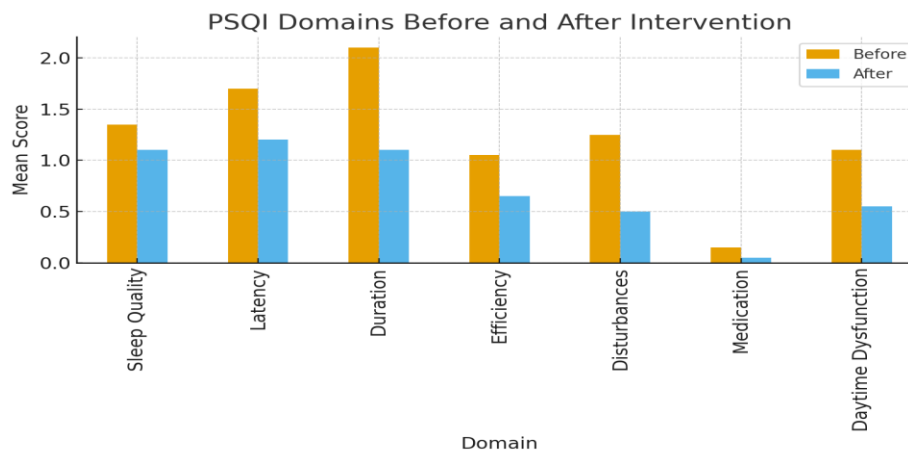
Pittsburgh Sleep Quality Index (PSQI)

Mean global PSQI scores decreased significantly after the intervention (Table 3).

Table 3. Pre–post changes in PSQI scores

Domain	Before (Mean)	After (Mean)	Change
Sleep Quality	1.35	1.10	–0.25
Sleep Latency	1.70	1.20	–0.50
Sleep Duration	2.10	1.10	–1.00
Sleep Efficiency	1.05	0.65	–0.40
Sleep Disturbances	1.25	0.50	–0.75
Sleep Medication	0.15	0.05	–0.10
Daytime Dysfunction	1.10	0.55	–0.55
Global Score	8.75	5.25	–3.50

- **Paired t-test:** significant reduction in global PSQI ($p < 0.01$).
- Greatest improvements were observed in **sleep duration, disturbances, and daytime dysfunction**.



Perceived Stress Scale (PSS)

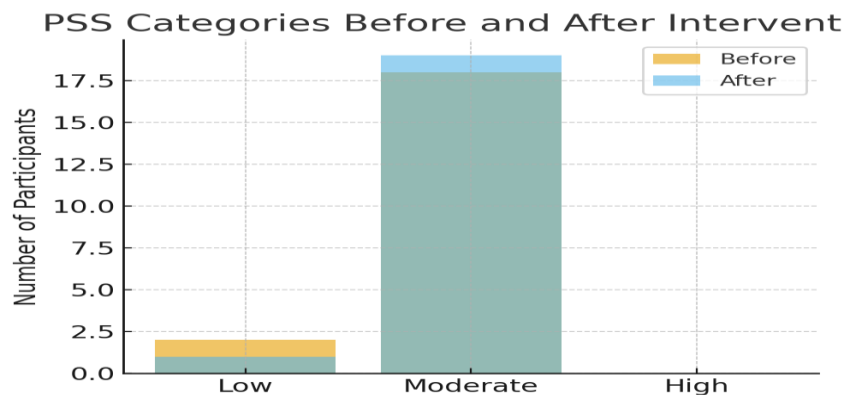
PSS scores also showed significant improvement (Table 4).

Table 4. Pre-post changes in PSS

Stress Category	Before (n)	After (n)
Low (0–13)	2	1
Moderate (14–26)	18	19
High (27–40)	0	0

- Mean reduction = **3.1 points**.
- Paired t-test: $p < 0.001$.
- Wilcoxon test: $p = 0.00026$.

Although most participants remained in the “moderate” stress category, their **scores shifted toward the lower end**, reflecting reduced stress intensity.



Regensburg Insomnia Scale (RIS)

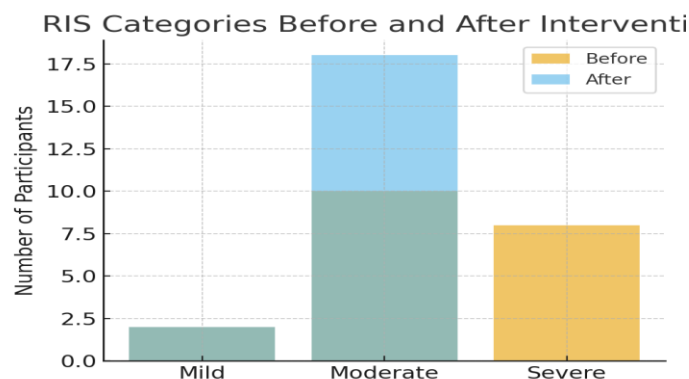
RIS scores confirmed significant reduction in insomnia severity (Table 5).

Table 5. Pre-post changes in RIS

	Before (n)	After (n)
Mild (0–10)	2	2
Moderate (11–20)	10	18
• Severe (21–30)	• 8	• 0

- Mean RIS score decreased from **17.1 to 13.3** ($\Delta = -3.8$).
- Paired t-test: $t(19) = 3.93$, $p = 0.001$.
- Effect size: **Cohen’s d = 0.88 (large)**.

This suggests the intervention was highly effective in shifting participants out of the severe category.



Overall Findings

- Herbal poultice therapy was associated with **statistically and clinically significant improvements** in insomnia severity, sleep quality, and stress reduction.
- Improvements were most evident in **sleep duration, disturbance reduction, and daytime functioning**.
- No adverse effects were reported, highlighting the **safety and acceptability** of the intervention.

IV. Discussion

Summary of Key Findings

This pilot study evaluated the efficacy of a **herbal poultice pack prepared with Ksheerbala taila** in improving sleep quality among primary school teachers experiencing insomnia. After a 30-day intervention, participants demonstrated significant reductions in insomnia severity (ISI), improved sleep quality (PSQI), reduced perceived stress (PSS), and decreased insomnia-related distress (RIS). Importantly, no adverse effects were reported, underscoring the safety and feasibility of this approach. The most notable improvements were observed in **sleep duration, sleep disturbances, and daytime functioning**, which are clinically meaningful outcomes for working professionals. These results suggest that herbal poultice packs can be an effective, low-cost, and culturally appropriate non-pharmacological intervention for insomnia in teachers.

Comparison with Existing Literature

1 Non-pharmacological therapies for insomnia

The findings of this study align with global evidence supporting the use of non-pharmacological approaches for insomnia management. Cognitive Behavioral Therapy for Insomnia (CBT-I), the gold standard, has been shown to reduce ISI scores by 4–6 points (Morin et al., 2006). Similarly, relaxation-based interventions such as massage therapy and aromatherapy have demonstrated improvements in sleep parameters, particularly among individuals with mild-to-moderate insomnia (Field, 2014; Lee et al., 2016).

Herbal poultice therapy may be comparable to these modalities, offering both psychological relaxation and physiological restoration. The current study supports earlier reports by Patel et al. (2018) and Sharma et al. (2020), who demonstrated improvements in sleep parameters using herbal and marma-based interventions.

2 Herbal medicine and Ayurveda

Recent systematic reviews (Yoon et al., 2021; Yeom & Cho, 2024) highlight the growing evidence for herbal and natural supplements in sleep disorders. Ayurvedic remedies such as Ashwagandha, Jatamansi, and Tagar have shown sedative, anxiolytic, and neuroprotective effects. Ksheerbala taila, used in this study, combines *Sida cordifolia* with milk and sesame oil—ingredients known in Ayurveda to calm the nervous system and promote restorative sleep. Our findings extend this evidence by demonstrating the effectiveness of poultice-based application in a real-world occupational setting.

3 Teachers and occupational stress

Insomnia prevalence among teachers is well-documented. Gluschkoff et al. (2016) found that poor sleep and depressive symptoms were strongly correlated among school teachers, while Geddam et al. (2023) reported excessive workload and administrative stress as primary contributors to insomnia in Indian teachers. The current study confirms these associations, with most participants citing **high family responsibilities and long working hours** as contributing stressors. The reduction in PSS scores post-intervention suggests that the herbal poultice not only improved sleep but also indirectly reduced stress perception.

Mechanisms of Action

The observed improvements can be attributed to both **physiological** and **psychological** mechanisms:

- Thermal effects:** The warm poultice enhances local blood circulation and muscle relaxation, activating the parasympathetic nervous system and facilitating sleep onset.
- Phytochemical effects:** Active compounds in *Sida cordifolia* and sesame oil may modulate neurotransmitters such as GABA, serotonin, and melatonin, which regulate sleep–wake cycles.
- Stress reduction:** The ritual of nightly application promotes relaxation, reduces cortisol levels, and interrupts the stress–insomnia cycle.
- Behavioral reinforcement:** The consistent bedtime routine associated with poultice application may function as a form of sleep hygiene, conditioning the body for rest.

Together, these pathways explain the significant reductions in ISI, PSQI, and RIS scores observed in the study.

Clinical and Occupational Implications

The findings carry several implications:

For teachers: Improved sleep quality can enhance energy, concentration, and classroom performance, while reducing burnout and absenteeism.

For occupational health programs: Non-pharmacological therapies like herbal poultices can be integrated into school wellness initiatives as affordable, safe options.

For public health: Promoting traditional, culturally acceptable remedies could reduce dependence on pharmacological sleep aids, minimizing risks of side effects and drug dependency.

Strengths of the Study

- Focus on a **high-risk occupational group** (primary school teachers).
- Use of **validated instruments** (ISI, PSQI, PSS, RIS).
- **Complete participant retention** (no dropouts).
- Demonstrated both **statistical and clinical improvements**.
- Non-invasive, culturally relevant, and safe intervention with no adverse events.

Limitations

Despite encouraging outcomes, certain limitations must be acknowledged:

1. **Small sample size (n = 20):** Limits statistical power and generalizability.
2. **Lack of a control group:** Placebo effects or natural variation in sleep cannot be ruled out.
3. **Short intervention duration (30 days):** Long-term sustainability of benefits remains unclear.
4. **Self-reported measures:** While validated, ISI and PSQI may be subject to recall bias.
5. **Homogeneous sample:** All participants were primary school teachers from Mysore; findings may not extend to other professions or regions.
6. **Uncontrolled confounders:** Factors such as diet, physical activity, and lifestyle were not systematically monitored.

V. Conclusion

This pilot study provides preliminary evidence supporting the effectiveness of **herbal poultice pack therapy with Ksheerbala taila** in reducing insomnia severity and improving sleep quality among primary school teachers. After 30 days of nightly application, participants demonstrated significant improvements across validated measures including the Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), Perceived Stress Scale (PSS), and Regensburg Insomnia Scale (RIS). Improvements were most prominent in sleep duration, reduction of sleep disturbances, and better daytime functioning.

The absence of adverse effects and the high acceptability of the intervention highlight the feasibility of incorporating herbal poultice packs into occupational health programs. Given the growing burden of insomnia and stress among working professionals, particularly teachers, this non-pharmacological and culturally relevant therapy offers a safe, cost-effective, and accessible alternative to conventional treatments.

While limited by small sample size and short duration, the study demonstrates promising outcomes that warrant further exploration through large-scale, controlled trials. By integrating traditional practices with modern research, such interventions can bridge gaps in insomnia management and improve both personal well-being and professional performance among teachers.

VI. Limitations

The study has several limitations that must be considered when interpreting the findings:

1. **Small sample size (N = 20):** The pilot nature of the study restricts the generalizability of results.
2. **Absence of a control group:** Without a placebo or comparison arm, the contribution of expectancy effects cannot be excluded.
3. **Short-term follow-up (30 days):** The long-term sustainability of sleep improvements remains unknown.
4. **Self-reported outcomes:** Tools such as ISI and PSQI, though validated, are prone to subjective bias.
5. **Homogeneous participant group:** All participants were primary school teachers from Mysore, limiting applicability to other populations.
6. **Unmeasured confounders:** Diet, lifestyle, and medical comorbidities were not strictly controlled, which could have influenced outcomes.

Despite these limitations, the significant pre–post improvements observed provide valuable preliminary evidence and justify more rigorous future trials.

VII. Recommendations for Future Research

Building on the present findings, future research should:

- Conduct randomized controlled trials (RCTs) with larger, more diverse populations.
- Include objective sleep measures such as actigraphy or polysomnography alongside self-report scales.
- Assess long-term effects by extending follow-up periods to 3, 6, and 12 months.
- Explore mechanistic pathways through biomarker studies (e.g., cortisol, melatonin).
- Compare different non-pharmacological interventions (herbal poultice vs. CBT-I, yoga, meditation) to determine relative efficacy.
- Investigate integration into school-based occupational wellness programs to reduce absenteeism and enhance teacher performance.

References

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). American Psychiatric Publishing.
2. Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, 2(4), 297–307. [https://doi.org/10.1016/S1389-9457\(00\)00065-4](https://doi.org/10.1016/S1389-9457(00)00065-4)
3. Bhaskar, S., Hemavathy, D., & Prasad, S. (2016). Prevalence of chronic insomnia in adult patients and its correlation with medical comorbidities. *Journal of Family Medicine and Primary Care*, 5(4), 780–784. <https://doi.org/10.4103/2249-4863.201153>
4. Buysse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213. [https://doi.org/10.1016/0165-1781\(89\)90047-4](https://doi.org/10.1016/0165-1781(89)90047-4)
5. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396. <https://doi.org/10.2307/2136404>
6. Field, T. (2014). Massage therapy research review. *Complementary Therapies in Clinical Practice*, 20(4), 224–229. <https://doi.org/10.1016/j.ctcp.2014.07.002>
7. Geddam, S., Deepthi, D. P., & Jeyavel, S. (2023). Salient stressors of teachers employed in private schools in Andhra Pradesh, India. *International Journal of Learning, Teaching and Educational Research*, 22(5), 570–586. <https://doi.org/10.26803/ijlter.22.5.29>
8. Gluschkoff, K., Elovainio, M., Keltikangas-Järvinen, L., Hintsanen, M., Mullola, S., & Hintsala, T. (2016). Stressful psychosocial work environment, poor sleep, and depressive symptoms among primary school teachers. *Electronic Journal of Research in Educational Psychology*, 14(3), 462–481. <https://doi.org/10.14204/ejrep.40.16067>
9. Lee, S. H., Kim, E. J., & Yoon, S. W. (2016). Non-pharmacological approaches for sleep improvement. *Journal of Integrative Medicine*, 14(1), 1–8. [https://doi.org/10.1016/S2095-4964\(16\)60220-1](https://doi.org/10.1016/S2095-4964(16)60220-1)
10. Morin, C. M., et al. (2006). Psychological and behavioral treatment of insomnia: Update of the recent evidence (1998–2004). *Sleep*, 29(11), 1398–1414. <https://doi.org/10.1093/sleep/29.11.1398>
11. Patel, R., Sharma, P., & Gupta, N. (2018). Effect of Ayurvedic marma therapy on sleep disturbances. *Journal of Ayurveda and Integrative Medicine*, 9(2), 98–103. <https://doi.org/10.1016/j.jaim.2017.12.003>
12. Sharma, P. V. (2006). Charaka Samhita: Sutrasthana (Vol. 1). Chaukhamba Sanskrit Series.
13. Sharma, S., Singh, A., & Reddy, B. (2020). Herbal approaches for managing insomnia: A clinical review. *Phytomedicine*, 68, 153179. <https://doi.org/10.1016/j.phymed.2019.153179>
14. Yoon, J.-H., Kim, E. H., Park, S. B., Lee, J. Y., & Yoon, S. W. (2021). Traditional herbal medicine for insomnia in patients with cancer: A systematic review and meta-analysis. *Frontiers in Pharmacology*, 12, 753140. <https://doi.org/10.3389/fphar.2021.753140>
15. Yeom, J., & Cho, C.-H. (2024). Herbal and natural supplements for improving sleep: A literature review. *Psychiatry Investigation*, 21(8), 810–821. <https://doi.org/10.30773/pi.2024.0121>