JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

ENHANCING SLEEP AND CALMS INSOMNOLENT THOUGHTS: THE ROLE OF YOGA

A Systematic Review

[1] Deepali Handa , [2]Dr. Indu Bala

[1]Research Scholar, [2] Assistant Professor *(corresponding* author*)*
[1]Department of Psychology,

[.2] Desh Bhagat University, Mandi Govindgarh, Punjab- 147301(India).

Abstract: Sleep disturbances are a major cause of mental and physical health, with traditional treatments often resulting in limited success. This systematic review examines the role of diverse yoga practices in improving sleep quality and alleviating insomnolent thoughts. By blending evidence from studies published between 2010 and 2024, this review evaluates how yoga interventions, like "Hatha, Kundalini, and Restorative Yoga", influence key psychological mechanisms underneath sleep disorders. The findings highlighted that yoga enhances sleep by reducing stress, modulating the autonomic nervous system, and promoting mindfulness. Specific yoga techniques, including pranayama (breathing exercises), asanas (postures), and meditation, are highlighted for their efficacy in addressing sleep onset latency and improving overall sleep duration and quality. The review identifies gaps in the current literature, such as variability in study designs, intervention duration, and participant demographics, which limit the generalizability of findings. Recommendations for integrating yoga into clinical and community settings to combat insomnia are provided, along with suggestions for future research to explore long-term impacts and individualized interventions.

Keywords: Sleep Disturbances, Insomnia, Yoga Practices, Sleep Quality, Insomnolent Thoughts, Hatha Yoga, Kundalini Yoga, Restorative Yoga, Stress Reduction, Mindfulness, Pranayama, Asanas, Meditation, Sleep Onset Latency, Autonomic Nervous System Modulation, Non-Invasive Sleep Interventions, Holistic Health Strategies

INTRODUCTION

Sleep is an essential component of human health that influences cognitive functions, emotional well-being, and physiological processes (Joshi & Paul, 2024). However, sleep disturbances, including insomnia, have become increasingly prevalent in modern society, often exacerbated by stress, lifestyle changes, and environmental factors (Turmel et al., 2022). If left untreated, insomnia is a major health issue that lowers quality of life and has a high morbidity rate in older persons (Medic et al., 2017). Morin and Jarrin (2022), when studying the epidemiology of insomnia, noticed that 20% of adults often have sleeplessness, and insomnia is found to impact ten percent of adults, which could become chronic within five years with a persistent rate of 40% (Morin & Jarrin, 2022).

Sleep disturbance, which is estimated to affect 50 to 70 million children and adults across all demographics and socioeconomic status, is a concern in today's world. While pharmacological interventions remain a common approach, concerns regarding long-term efficacy and side effects like drowsiness, headache, fatigue and addiction to medicines have driven a surge in interest towards alternative and holistic therapies, such as yoga (Mathew & Rangasamy, 2024).

As per ancient Indian philosophy, yoga, a combination of physical postures (asanas), controlled breathing (pranayama), and meditative techniques, are used to cure physical problems through relaxation and mindfulness. Research has shown that yoga significantly improves sleep quality by modulating autonomic nervous system activity, reducing cortisol levels, and enhancing melatonin production (Kanchibhotla et al., 2021). The literary work verified that "Sudarshan Kriya Yoga (SKY), Hatha Yoga, and Yoga Nidra" can alleviate insomnolent thoughts, decrease sleep onset latency, and improve overall sleep efficiency (Datta et al., 2021).

Chronic insomnia is comorbid with elevated anxiety, emotional distress, and hyperarousal. All of which can be mitigated through regular yoga practice (Halpern et al., 2014). Empirical evidence suggests that yoga enhances emotional regulation, reduces overactive cognitive processes, and raises a state of inner tranquillity necessary for restorative sleep (Wang et al., 2020).

Even though these findings are promising, challenges still remain in standardizing yoga interventions. This is because the variations in study designs, participant demographics, and intervention durations limit the generalizability of results (Bhargav et al., 2024). While integrating yoga into clinical and community settings holds significant potential, it could also be a non-pharmacological, holistic approach to improving sleep health (Mumtaz et al., 2024).

This review aims to find out yoga's role in sleep enhancement, to evaluate its effectiveness in calming insomnolent thoughts, changing neurophysiological mapping, and for promoting sleep quality from the existing literature. It also highlights gaps in current research and provides recommendations for future studies to optimize yoga-based interventions for sleep disorders.

METHODOLOGY

Study Design

In accordance with the "PRISMA 2020" (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), this systematic review was conducted (Comellas et al., 2020).

Search Strategy and Search Criteria

The data specified was retrieved using PubMed, Semantic Scholar, and Google Scholar. Boolean search operators were employed to refine the search strategy, ensuring a comprehensive and targeted approach. Search terms included "Yoga and Sleep Quality", "Yoga Interventions and Insomnia", "Pranayama and Sleep Improvement", "Yoga Postures and Sleep Duration", and "Long-term effects of Yoga on Sleep Quality", along with filters such as Language: English, Open Access Peer Reviewed Full Text, 2010-2024, 'All in title' and Search Terms in 'title/abstract'. The focus was identifying peer-reviewed full-text articles published after 2010 (Comellas et al., 2020).

Inclusion Criteria

Extensive exclusion criteria were employed to ensure the quality and relevance of the included studies. The researcher omitted studies published in languages other than English, and pre-print studies from inclusion Additionally, studies exhibiting a high risk of biases were removed. Only full-text publications published in peer-reviewed journals from 2010 to 2024 were included (Comellas et al., 2020).

Data Extraction

A Data Extraction spreadsheet was developed. The following data was extracted from the included studies: 1) Author(s) and Year of Publication, 2) Summarized Abstract, 3) Objectives, 4) Study Design, 5) Population, 6) Interventions and Control/Comparator, 7) Outcomes, 8) Findings, 9) Results, 10) Challenges, 11) Research Gaps and Future Research Direction.

Risk of Bias Assessment

Systematic reviews often face the possibility of biases for various reasons. The "RoB 2 tool", a standardized instrument, assesses bias in randomized controlled trials (RCTs). Additionally, the "PRISMA 2020 Checklist for Systematic Reviews" was followed to ensure methodological rigor. Studies categorized as having a 'High' or 'critical' risk of bias were excluded from the review.

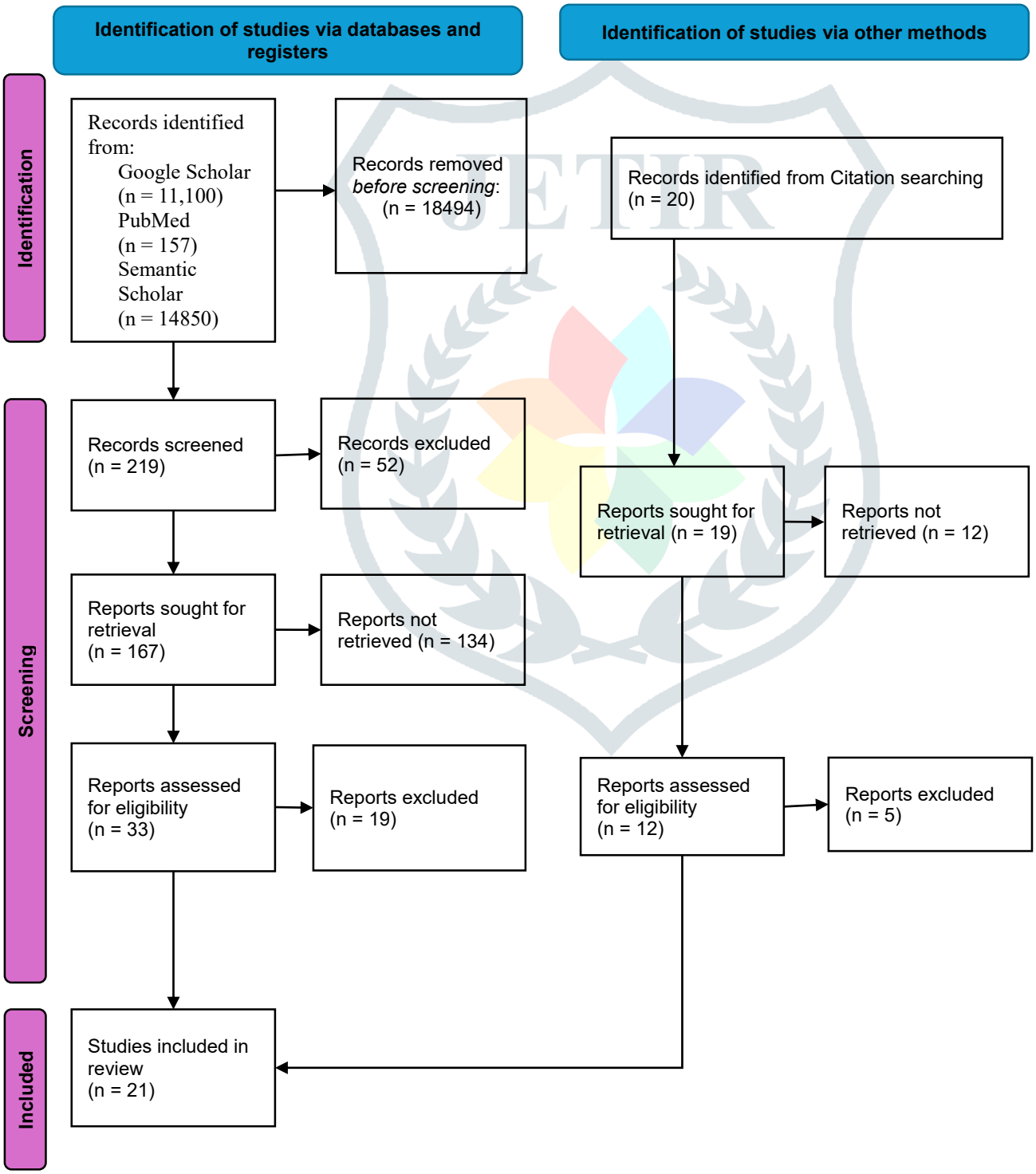

Figure 1: PRISMA Flowchart of the Systematic Review conducted.

Data Synthesis

The collected and synthesised data was systematically organized into tables, where key information was categorized into relevant themes. Recurring patterns were identified, and interactions between these themes were analyzed to provide a structured synthesis of the findings.

RESULT

This review synthesizes findings from multiple studies on the benefit of yoga for sleep-related problems like quality and duration, and overall well-being. The research spans randomized controlled trials (RCTs), systematic reviews, intervention studies, and qualitative research, with a particular focus on populations experiencing chronic sleep disturbances, stress, anxiety, and other health-related issues. The studies examine different yoga techniques, their physiological and psychological mechanisms, and their effectiveness compared to conventional treatments. The three key themes that were prominent include "*Yoga as a Non-Pharmacological Intervention for Insomnia*" (Wang et al. (2020), "*Reduction in Stress and Anxiety*" (Basavegowda et al., 2023; Bhargav et al.,2024), "*Improvement in Mental Health and Well-Being"* (Verma et al., 2023; Shivarama, 2024).

Key Findings

Mainly, four major themes were identified, and their frequency of occurrence was recorded.

Table 1 showing the frequency of occurrence of each identified theme.

Theme	*f*	Key Studies	Findings
1	44	Wang et al. (2020), Turmel et al. (2022), Datta et al. (2021)	Yoga improves sleep efficiency, reduces sleep latency, and enhances subjective sleep quality. Proven benefits in reducing sleep fragmentation and regulating hormonal balance.
2	67	Basavegowda et al. (2023), Bhargav et al. (2024), Mathew & Rangasamy (2024)	Yoga lowers cortisol levels, promotes relaxation, and reduces stress and anxiety. Effective for healthcare professionals and individuals dealing with long COVID.
3	19	Verma et al. (2023), Shivarama (2024), Pooraghaei et al. (2024)	Yoga aids in reducing depression, emotional instability, and fatigue. Supports cognitive function, emotional balance, and resilience in cancer patients and athletes.

S. No	Themes	*f*
1	Yoga as a Non-Pharmacological Intervention for Insomnia	44
2	Reduction in Stress and Anxiety	67
3	Improvement in Mental Health and Well-Being	19
4	The Role of Yoga in Specific Populations	05

Table 2 showing the studies associated with the identified themes and the corresponding findings.

DISCUSSION

The thematic analysis of the studies revealed that yoga interventions significantly improve sleep quality, address stress and anxiety, and enhance overall mental well-being.

1. Yoga as a Non-Pharmacological Intervention for Insomnia (44 occurrences)

Several studies confirm yoga's effectiveness in managing insomnia and improving sleep quality, making it a viable alternative to pharmacological treatments.

- Wang et al. (2020) conducted a "*systematic review and meta-analysis*" on yoga's benefits on women with sleep disturbances. The study found significant improvements in sleep quality, particularly in non-cancer and non-postmenopausal subgroups, indicating that yoga could be particularly beneficial for younger women experiencing sleep issues. Findings also revealed subjective improvements in sleep efficiency and reduced sleep fragmentation, even though polysomnography data did not show significant changes, highlighting yoga's potential to enhance perceived sleep quality.

- Datta et al. (2022) investigated individualized yoga interventions for chronic insomnia and found that participants experienced increased deep sleep (N2 and N3 stages) and reduced cortisol levels, reinforcing yoga's role in reducing sleep disturbances through relaxation and hormonal balance.

These findings indicate that yoga enhances sleep latency, making it an effective, non-invasive treatment for individuals struggling with insomnia.

2. Reduction in Stress and Anxiety (67 occurrences)

Yoga and pranayama are strongly linked to stress and anxiety reduction, with evidence pointing to their role in lowering cortisol levels and promoting relaxation responses.

- Basavegowda et al. (2023) examined yoga's role in reducing work-related stress and insomnia among healthcare professionals. Their study found that a six-week yoga intervention significantly reduced stress, improved sleep duration, and enhanced overall well-being, making it a suitable tool for high-stress professions.
- Bhargav et al. (2024) investigated individuals with long COVID. The study found enhancement in sleep and its quality and marked drops in stress and anxiety, demonstrating that even remote yoga sessions can be highly effective in stress management and relaxation.
- Mathew & Rangasamy (2024) studied the impact of yoga on insomnia. The outcome showed a substantial decrease in stress levels and an improvement in overall emotional resilience, suggesting that yoga can be particularly beneficial for older populations who face age-related stressors.

These findings reinforce yoga's proven ability to regulate parasympathetic activation (relaxation response) and reduce sympathetic overactivity (stress response).

3. Improvement in Mental Health and Well-Being (19 occurrences)

Beyond sleep and stress relief, yoga has demonstrated broader mental health benefits, including reductions in depression, emotional instability, and fatigue.

- Verma et al. (2023) conducted a randomized controlled trial comparing yoga and Ayurveda for insomnia treatment. Their study found that yoga is more effective than Ayurvedic interventions for stress management and enhancing cognitive functions, indicating that yoga can support mental clarity and emotional stability.
- Shivarama (2024) explored yoga's impact on cancer patients and found that it significantly reduced anxiety and enhanced resilience, supporting its role in complementary cancer care.
- Pooraghaei et al. (2024) studied Hatha yoga's effects on athletes and discovered that yoga improved recovery and re-regulation, making it an effective practice for individuals exposed to high-performance stress.

These findings suggest that yoga not only reduces stress and sleep disturbances but also fosters emotional and overall psychological well-being. Yoga has been recognized as an effective non-pharmacological intervention for improving sleep quality at the same time reducing insomnolent thoughts. The *asanas* "body postures", *pranayama* "breathing exercises", and meditation, have been shown to activate the parasympathetic nervous system, thus bringing a stage of relaxation, which is important for sleep and its quality (Joshi & Paul, 2024). Various studies have demonstrated the positive impact of yoga on sleep parameters, particularly in populations suffering from sleep disturbances such as insomnia and those with chronic health conditions (Wang et al., 2020).

The following sections explore the specific roles and mechanisms through which yoga contributes to better sleep quality.

Mechanisms of Yoga in Improving Sleep Quality

- **Activation of the Parasympathetic Nervous System:** Yoga techniques like asanas, pranayama, and meditation engage the parasympathetic nervous system, hence promoting relaxation, leading to stress reduction, thereby improving sleep quality (Turmel et al., 2022).

- **Drop in Psychological Stress:** Yoga can lessen stress levels, which is known for sleep disturbances. Studies have reported lower perceived stress and increased sleep quality among yoga participants (Baklouti et al., 2022).
- **Mindfulness and Rumination Reduction:** Yoga encourages mindfulness, which helps individuals manage psychological distress and reduce rumination and anxiety, thus improving sleep quality (Cocchiara et al., 2019).

Evidence from Clinical Studies

- **Randomized Controlled Trials:** Several studies have recognized significant improvements in sleep quality and decreases in sleep latency among adults with insomnia who participated in structured yoga programs. These improvements were statistically significant compared to control groups receiving standard care (Mathew & Rangasamy, 2024).
- **Cancer Patients:** Yoga has been particularly effective in improving sleep quality among cancer patients, with numerous studies and meta-analyses supporting its broad applicability and effectiveness in this population (Shivarama, 2024).
- **Chronic Insomnia:** In patients with chronic insomnia, individualized yoga practices have improved in subjective sleep quality and reductions in daytime symptoms such as fatigue and anxiety (Turmel et al., 2022).

Specific Yoga Practices and Their Impact

- **Yoga Nidra:** This practice has proven to improve sleep efficiency and reduce total wake duration in patients with chronic insomnia, with significant improvements in subjective sleep quality (Datta et al., 2021).
- **Sudarshan Kriya Yoga (SKY):** This technique of yogic breathing has verified improvements in sleep quality, with more frequent practice yielding better results (Kanchibhotla et al., 2021).
- **Integrated Yoga Module (IYM):** A specifically designed yoga module for insomnia management has shown significant improvements in sleep quality, validated through content validity and feasibility studies (Panjwani et al., 2021).

CONCLUSION

The collective findings strongly support yoga as an effective intervention for sleep improvement, addressing stress, and mental health enhancement. Studies consistently demonstrate that yoga:

- Improves sleep efficiency and sleep quality.
- Reduces insomnia severity, stress, anxiety, and burnout.
- Enhances cognitive function, mood, and overall quality of life.
- Provides a viable non-pharmacological alternative to conventional sleep treatments.

While yoga has shown promising results in improving sleep quality and reducing insomnolent thoughts, it is important to consider the unevenness in intervention procedures and reliance on self-reported measures in existing research. With growing evidence, integrating yoga into medical and wellness programs can be a cost-effective, accessible, and scalable approach to improving public health and mental well-being.

To validate outcomes, subsequent studies must include objective sleep tests, a bigger sample size, and diverse populations. Furthermore, the long-term effects of yoga on sleep quality and the identification of effective practices for different patient subgroups is a research need. For non-pharmacological intervention for managing sleep disturbances, Yoga has proved to be viable. Offering a holistic approach part from enhancing overall well-being.

REFERENCES

Baklouti, S., Fekih-Romdhane, F., Guelmami, N., Bonsaksen, T., Baklouti, H., Aloui, A., Masmoudi, L., Souissi, N., & Jarraya, M. (2022). The effect of web-based Hatha yoga on psychological distress and sleep quality in older adults: A randomized controlled trial. *Complementary Therapies in Clinical Practice, 50*, 101715 - 101715. https://doi.org/10.1016/j.ctcp.2022.101715

Basavegowda, M., Umeshchandra, S. M., Duraisamy, P., Thimmulappa, R. K., Manivasagan, M. S., Mallaiah, C., Madhu, J. V., Yogeeshwaran, V. V., Vishwanath, N., Rudramuniyappa, V. K., Galag, S. C., & Manasa Priya Dwadasi, V. (2023). The effect of yoga on insomnia and quality of life among nursing professionals during COVID-19: A pre-post-test interventional study. *Indian Journal Of Psychiatry*, *65*(11), 1143–1150. https://doi.org/10.4103/indianjpsychiatry.indianjpsychiatry_573_23

Bhargav, H., Raghavan, V., Rao, N. P., Gulati, K., Binumon, K. V., Anu, K. N., Ravi, S., Jasti, N., Holla, B., Varambally, S., & Ramachandran, P. (2024). Validation and efficacy of a tele-yoga intervention for improving psychological stress, mental health and sleep difficulties of stressed adults diagnosed with long COVID: a prospective, multi-center, open-label single-arm study. *Frontiers In Psychology*, *15*, 1436691. https://doi.org/10.3389/fpsyg.2024.1436691

Cocchiara, R. A., Peruzzo, M., Mannocci, A., Ottolenghi, L., Villari, P., Polimeni, A., Guerra, F., & La Torre, G. (2019). The use of yoga to manage stress and burnout in healthcare workers: a systematic review. *Journal Of Clinical Medicine*, *8*(3), 284. https://doi.org/10.3390/jcm8030284

Datta, K., Tripathi, M., Verma, M., Masiwal, D., & Mallick, H. N. (2021). Yoga nidra practice shows improvement in sleep in patients with chronic insomnia: A randomized controlled trial. *National Medical Journal of India*, *34*(3). [Link]

Fricke-Comellas, H., Heredia-Rizo, A. M., Casuso-Holgado, M. J., Salas-González, J., & Fernández-Seguín, L. M. (2024). Exploring the effects of qigong, tai chi, and yoga on fatigue, mental health, and sleep quality in chronic fatigue and post-covid syndromes: a systematic review with meta-analysis. *Healthcare (Basel, Switzerland)*, *12*(20), 2020. https://doi.org/10.3390/healthcare12202020

Halpern, J., Cohen, M., Kennedy, G., Reece, J., Cahan, C., & Baharav, A. (2014). Yoga for improving sleep quality and quality of life for older adults. *Altern Ther Health Med*, *20*(3), 37-46. [Link]

Joshi, N., & Paul, B. (2024). Efficacy of yoga intervention for the improvement of the quality of sleep: a review. *Divyayatan-A Journal of Lakulish Yoga University*, *1*(3), 18-22. **DOI:** https://doi.org/10.69919/s9f6vw61

Kanchibhotla, D., Parekh, S.G., Harsora, P. *et al.* The influence of Sudarshan kriya yoga on sleep quality in Indian adults: an open trial pilot study. *Sleep Vigilance* **5**, 213–220 (2021). https://doi.org/10.1007/s41782-021-00146-4

Mathew, D., & Rangasamy, M. (2024). Effect of yoga therapy on insomnia severity and systolic blood pressure in aged women: a 12-week intervention study conducted in kerala. *Cureus*, *16*(3). doi: 10.7759/cureus.57169

Mehta, V. (2024). Effectiveness of yoga therapy in improving sleep quality: a pilot study. *Indian Journal of Ayurveda & Alternative Medicines*, *1*(1), 1-7. https://doi.org/10.36676/ijaam.v1.i1.1

Mumtaz, O., Hameed, M., Kashif, R. S., Abazeed, S., Ali, A., Qureshi , A. U., Akhtar, A., & Saeed, F. (2024). Yoga exercises as a therapeutic approach for adults with insomnia to promote better sleep: a randomized control trial. *Journal of Health and Rehabilitation Research*, *4*(2), 585–592. https://doi.org/10.61919/jhrr.v4i2.897

Panjwani, U., Dudani, S., & Wadhwa, M. (2021). Sleep, Cognition, and Yoga. *International Journal of Yoga, 14*, 100 - 108. DOI: 10.4103/ijoy.IJOY_110_20

Pooraghaei Ardekani Z, Mohammadi M, Zarian E. (2024). The impact of yoga exercises on athletes' anxiety and sleep quality in the coronavirus pandemic the impact of yoga exercises on athletes' anxiety and sleep quality in the coronavirus pandemic. *Physical Treatments. 2024; 14(*3):217-226. http://dx.doi.org/10.32598/ptj.14.3.582.1

Rshikesan, P. B., Subramanya, P., & Singh, D. (2017). Sleep quality and body composition variations in obese male adults after 14 weeks of yoga intervention: a randomized controlled trial. *International journal of yoga*, *10*(3), 128–137. https://doi.org/10.4103/ijoy.IJOY_53_16

Shivarama, A. K. B. (2024). Restoring rest: exploring yoga's influence on sleep quality in cancer patients. *International Journal Of Community Medicine And Public Health*, *11*(9), 3738–3744. https://doi.org/10.18203/2394-6040.ijcmph20242583

Turmel, D., Carlier, S., Bruyneel, A., & Bruyneel, M. (2022). Tailored individual Yoga practice improves sleep quality, fatigue, anxiety, and depression in chronic insomnia disorder. *BMC Psychiatry, 22*. https://doi.org/10.1186/s12888-022-03936-w

Verma, K., Singh, D., Srivastava, A. (2023). Comparative impact of yoga and ayurveda practice in insomnia: A randomized controlled trial. Journal of Education and Health Promotion 12(1):160, May 2023. | DOI: 10.4103/jehp.jehp_1489_22

Wang, W. L., Chen, K. H., Pan, Y. C., Yang, S. N., & Chan, Y. Y. (2020). The effect of yoga on sleep quality and insomnia in women with sleep problems: a systematic review and meta-analysis. *BMC psychiatry*, *20*(1), 195. https://doi.org/10.1186/s12888-020-02566-4

Yadav, V. S., Pundir, M., Maurya, B. N., Tripathi, V., Kumar, M., & Maurya, A. (2024). Development, Validation, and feasibility of Integrated Yoga module on Anidra (Insomnia). *Bharati Vidyapeeth Medical Journal*, *4*(2), 29–35. https://doi.org/10.56136/bvmj/2024_00308