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Traditional Yoga and Meditation Counseling as Non-Pharmacological Therapy for Insomnia in the Yoga DHSP Bali Community, Banjar Singin, Selemadeg, Tabanan Regency

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ABSTRACT

Insomnia is a common sleep disorder characterized by difficulty in falling or staying asleep, negatively impacting physical, mental, and emotional health. Factors such as stress, anxiety, irregular lifestyles, and medical conditions contribute to insomnia. Traditional Yoga and Meditation Counseling as Non-Pharmacological Therapy for Insomnia in the Yoga DHSP Bali Community, Banjar Singin, Selemadeg, Tabanan Regency has gained recognition for improving sleep quality by promoting relaxation, reducing stress, and enhancing emotional balance. This study explores the effectiveness of yoga and meditation as a non-pharmacological treatment for insomnia. Using a descriptive qualitative approach, counselling sessions were conducted with participants experiencing mild to moderate insomnia. Over four weeks, participants practiced structured yoga postures (asana), controlled breathing (pranayama), and meditation techniques. Data were collected from self-reports, sleep diaries, and observations. Findings show that regular yoga and meditation significantly improved sleep latency, duration, and overall quality. Participants experienced reduced anxiety and stress alongside greater awareness of body and mind, contributing to enhanced well-being. These results suggest yoga and meditation are effective complementary therapies for insomnia when combined with lifestyle changes and stress management. The study highlights the potential of mind-body interventions to enhance sleep health. Future community health programs should incorporate structured yoga and meditation sessions to promote non-pharmacological approaches for managing sleep disorders.

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INTRODUCTION

Insomnia is one of the most common sleep disorders characterized by difficulty initiating sleep, maintaining sleep, or experiencing unrestorative sleep, which impacts daytime functioning (Morin et al., 2015). The prevalence of insomnia globally ranges from 10–30% and can exceed 50% in certain populations such as the elderly and individuals with mental disorders (Bhaskar et al., 2016). This condition not only diminishes quality of life but also increases the risk of various chronic diseases such as hypertension, diabetes, and depressive disorders (Morin et al., 2015).

Pharmacological approaches are often used as first-line therapies for insomnia, but long-term use of sleeping pills can lead to side effects, dependence, and tolerance (Wang et al., 2020). Therefore, non-pharmacological approaches such as yoga and meditation are gaining attention as effective and safe complementary and alternative therapies to manage insomnia. Yoga, as a holistic practice combining posture (asana), breathing exercises (pranayama), and meditation, has been shown to improve sleep quality via activation of the parasympathetic

nervous system and stress reduction (Chong et al., 2016; Rusch et al., 2018). Meanwhile, mindfulness meditation has demonstrated significant impact in reducing insomnia symptoms by improving emotion regulation and decreasing cognitive hyperactivity that often causes sleep difficulties (Rusch et al., 2018; Ong et al., 2016).

From a neuroscience perspective, the practice of yoga and meditation is known to improve neuroplasticity, regulate the hypothalamic-pituitary-adrenal axis (HPA axis), and modulate activity in the amygdala and prefrontal cortex, all of which are critical for stress regulation and sleep (Tang et al., 2015; Zeidan et al., 2019). Neuroimaging studies have also shown that long-term meditation is associated with increased cortical thickness in brain regions involved in attention and self-awareness (Hölzel et al., 2016).

As interest in non-pharmacological interventions grows, it is important to explore more deeply the relationship between yoga and meditation in the context of insomnia. Therefore, this article aims to comprehensively discuss the role and mechanisms of yoga and meditation as alternative therapies in overcoming sleep disorders, specifically insomnia, based on the latest scientific findings from neuroscience and clinical psychology.

The development of DHSP Bali yoga and meditation is thought to have begun in the 19th century, with the last known traditional medicine practice activities occurring around the 1920s–1940s. This is supported by the existence of an ancestral journey inscription in Saingin Village (now Singin Village). The tracing and translation of the inscription were conducted around 1976 with the assistance of prominent writer Mr. Ketut Soebandi (deceased), together with family representatives at a museum in Denpasar (Setiabudi, 2024). Meditation, as a technique or practice aiming to train the mind to increase human consciousness and control mental processes consciously (Setiabudi, 2024), consists of three stages at DHSP Bali: the basic stage (basic stages 1 and 2), the intermediate stage (intermediate stages 1 and 2), and the advanced stage. The basic stage focuses on breathing exercises followed by techniques for cleansing the atman and soul, performing japa, worship, and thanksgiving. Basic meditation techniques progress to intermediate techniques that train attention, focus, sharpen visualization and instincts, and align the energies of space and mother in an open-eye position. The final advanced technique centers on generating affirmations of happiness.

In line with the vision and mission of the Faculty of Medicine, Mahasaraswati University Denpasar, which excels in Ethnomedicine, community service activities are required focusing on ethnomedicine applications tailored to partner problems.

Sleep is a natural and reversible biological state characterized by diminished responses to external stimuli and changes in brain activity patterns. From a neuroscience perspective, sleep is an active process involving neurochemical regulation and complex brain circuits, especially in the thalamo-cortical system, brainstem, and hypothalamus (Brown et al., 2015). Sleep is divided into two main phases: Non-Rapid Eye Movement (NREM) and Rapid Eye Movement (REM), each with distinct brain activity patterns and physiological functions.

During NREM sleep, cortical activity significantly decreases, slow-wave (delta) activity increases, and the parasympathetic system dominates, which is essential for physical recovery and brain metabolism. In the REM phase, brain activity resembles a conscious state, but muscle atonia and increased limbic system activity occur, closely related to emotional memory consolidation and dreaming (Rasch & Born, 2016).

Sleep disorders, from a neuroscience perspective, represent dysfunctions in neurobiological mechanisms regulating the sleep-wake cycle, affecting sleep quality, duration, or architecture. One of the most common disorders is insomnia, characterized by difficulty initiating or maintaining sleep alongside impaired daytime functioning. Neurobiologically, insomnia is linked to hyperactivation of the central nervous system, particularly in the prefrontal cortex, amygdala, and hypothalamus, as well as dysregulation of the HPA axis leading to increased nocturnal cortisol (Baglioni et al., 2016).

Neuroimaging studies indicate that chronic insomnia patients exhibit increased activity in the default mode network (DMN) at rest, and impaired connectivity between the prefrontal and limbic cortex, interfering with the ability to calm the mind at bedtime (Chen et al., 2020). Other sleep disorders, such as sleep apnea, narcolepsy, and parasomnia, involve dysfunction or damage in brain areas like the hypothalamus and brainstem, and neurotransmitter systems such as orexin/hypocretin, serotonin, and GABA (Saper et al., 2017).

Insomnia involves an imbalance of neurotransmitters regulating sleep and wakefulness. For example, a decrease in Gamma-Aminobutyric Acid (GABA) activity in the thalamus and cortex reduces sleep induction (Winkelman, 2020), whereas an increase in orexin raises alertness and contributes to sleep difficulties. Heightened dopaminergic and noradrenergic systems, especially noradrenaline, are also associated with increased alertness and sleep-onset problems.

Chronic insomnia is linked to increased sympathetic nervous system activity and cortical hyperactivation. Patients exhibit higher brain metabolism, heart rate, and nighttime cortisol levels, supporting the hyperarousal theory where the brain remains 'wakeful' even during attempted sleep. Neuroimaging shows elevated activity in the prefrontal cortex, thalamus, and limbic system during sleep compared to healthy individuals (Riemann et al., 2020).

The Default Mode Network (DMN) is active during rest and internal thought. In insomnia, the DMN remains active when attempting to sleep, causing overthinking and inability to "turn off" the mind (Leerssen et al., 2021). The amygdala and ventromedial prefrontal cortex also show increased activity in insomnia patients, correlating with heightened stress and anxiety sensitivity, which exacerbates insomnia.

The pathophysiology of insomnia involves not only psychological or behavioral factors but also neurophysiological hyperactivation, neurotransmitter imbalances, and abnormal activity in specific brain regions. This understanding guides the development of effective pharmacological and non-pharmacological treatments.

Insomnia can be classified by duration, etiology, and neurobiological patterns. By duration, it is divided into acute (<3 months) often linked to external or environmental stressors, and chronic (≥3 months with ≥3 nights/week), with structural and functional brain changes, especially in arousal and sleep inhibition systems (Kay & Buysse, 2020). Etiologically, primary insomnia occurs independently of other medical or psychiatric conditions, while secondary insomnia arises as a symptom of other disorders such as depression or chronic pain.

Neurobiologically, hyperarousal insomnia is characterized by CNS hyperactivity (cortical arousal), HPA axis disorders, and DMN dysregulation (Kay & Buysse, 2020).

Insomnia symptoms include difficulty falling asleep (sleep onset insomnia), trouble maintaining sleep, or early morning awakening. Neuropsychological effects manifest as

cognitive impairments in attention, concentration, and memory, along with emotional dysregulation such as irritability, anxiety, and mild depression. Fatigue and decreased motivation are also prominent. Brain imaging reveals increased amygdala activity and reduced connectivity between the amygdala and medial prefrontal cortex, illustrating overreaction to emotional stress (Leerssen et al., 2021).

Physical signs in insomnia include elevated heart rate, blood pressure, increased nocturnal cortisol, and circadian rhythm disruption, reinforcing the hyperarousal theory (Riemann et al., 2020).

Neurological complaints related to sleep disorders, particularly inorganic insomnia, are common causes of chronic fatigue. Insomnia prevalence is significant in productive age groups, with rates of 65% in the elderly and 43.7% in adolescents over 19 years old. Insomnia complaints considerably affect productivity in Banjar Singin, notably among the productive-age population.

Access to neurological services is limited to Tabanan Hospital, about 17 km away, posing challenges for insomnia sufferers. Treatment typically requires neurologist consultation and pharmacotherapy, which are not available over-the-counter. Limited availability of four-wheeled transportation and lack of accessible public or online transport exacerbate difficulties for Banjar Singin patients.

There is also a lack of knowledge and education about non-pharmacological therapies for insomnia, including yoga and meditation exercises.

The primary goal of this yoga and meditation counseling activity for insomnia patients is to enhance public knowledge, awareness, and attitudes regarding proper identification, prevention, and treatment of insomnia through promotive, preventive, and therapeutic approaches.

After participating in counseling, individuals are expected to understand that insomnia is not merely "difficulty sleeping" but a sleep disorder affecting physical and mental health. They should be able to recognize insomnia manifestations: difficulty initiating sleep, frequent night awakenings, or early awakening. Participants will learn about insomnia causes, including stress, unhealthy lifestyle, pre-bedtime gadget use, medical illnesses, and psychiatric disorders. They will understand that insomnia can lead to chronic fatigue, impaired concentration, depression, hypertension, and reduced productivity. Simple self-managed treatments include applying sleep hygiene principles, such as maintaining a sleep routine, avoiding caffeine at night, and managing stress. Participants will also learn when to consult healthcare professionals if insomnia persists and impacts daily activities.

Several studies have examined the effectiveness of yoga and meditation in improving sleep quality. For instance, Rusch et al. (2018) demonstrated that mindfulness-based interventions significantly reduced insomnia severity by improving emotional regulation and reducing cognitive hyperarousal. Similarly, Manjunath and Telles (2018) found that yoga practices combining asanas, pranayama, and meditation enhanced parasympathetic activity, improving sleep latency and duration. While these studies provide strong evidence of yoga and meditation benefits, they primarily focus on short-term clinical or experimental interventions and often overlook traditional and culturally rooted practices such as the DHSP Bali method. Additionally, prior research has largely neglected integrating ethnomedical

knowledge, historical continuity, and structured multi-level meditation techniques, which may influence adherence, effectiveness, and holistic community outcomes.

This study aims to raise community awareness of ethnomedicine-based insomnia interventions, provide evidence-based alternatives to pharmacological treatments, and promote culturally sensitive health practices. Consequently, it contributes to preserving local knowledge, enhancing non-pharmacological sleep disorder approaches, and offering a replicable community-based wellness program model.

METHOD

The implementation of this PKM activity began with the process of preparing and submitting proposals for event activities involving the organizing committee and partner coordinators from the DHSP Bali yoga community in Banjar Singin, Selemadeg District, Tabanan Regency. This initial process began in June 2025 and was carried out actively by surveying field conditions, event venue plans and socializing with the surrounding community for the smooth running of the event. After the event committee meeting, the process of preparing tools and materials for health counseling was carried out. Preparation, especially counseling materials containing a series of yoga and meditation gymnastics movements, will be delivered by audio-visual counseling methods to increase public awareness and knowledge about insomnia management.

The health counseling event was held on Sunday, July 6, 2025, starting at 9 am and lasted for 4 hours until 1 pm. Registration of patient data including name, gender, and age was done manually by the committee. The number of participants who attended the event was 32 people. After registration, participants then did a pre-test of 10 questions containing questions in the form of multiple choice to find out basic knowledge related to sleep disorders among the public with a duration of 10 minutes. The event was then continued with an extension session with the method of presenting material in the form of power points for 20 minutes and a short discussion within 30 minutes. In closing, a post-test was carried out to determine the effectiveness of counseling in increasing the knowledge of the general public on sleep disorders.

RESULTS AND DISCUSSION

From the registration process of participants in health service events, personal data is recorded, and data is obtained according to table 1. Furthermore, the evaluation of the pre-test and post-test results after counseling was carried out as seen in table 2.

Table 1. Gender and age data of insomnia counseling participants

Variable		Frequency
Gender	Man	13(40,6%)
	Woman	19 (59,4%)
Age	Average	52 years old (SD ± 13.3)*
	median	55 years old
	Minimum	27 years old
	maximum	77 years old

*SD = standar deviasi

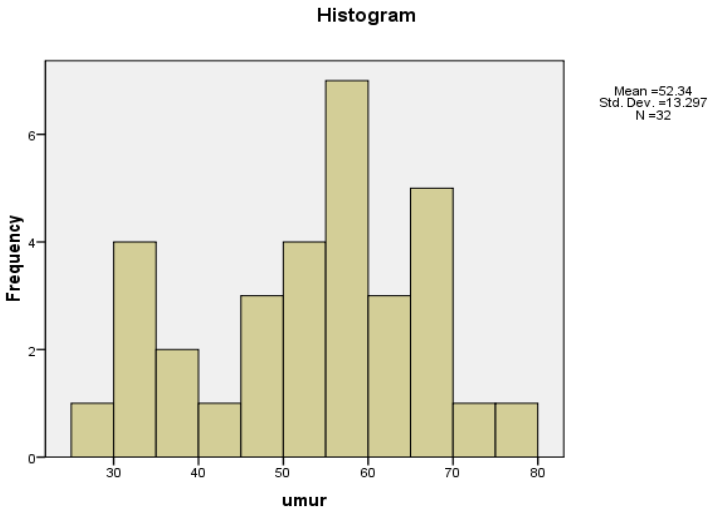


Figure 1. Age Data of Insomnia Counseling Participants

In table 1, data on 13 participants (40.6%) were male and 19 people (59.4%) were female participants. From figure 1, it can be seen that the average age of participants is 52 years old (SD + 13.3), with a median value of 55 years. The youngest participant to participate in counseling was 27 years old and the oldest participant was 77 years old.

Table 2. Pre-Post Test Scores

Variable	Average (±Std. Deviation)	Minimum Value	Maximum Value	IK 95% (p)
Pre-test	5 (±1,39)	1	8	4,50-5,50 (p= 0,006)
Post-test	7,44 (±1,26)	4	10	7,02-7,86 (p=0,000)

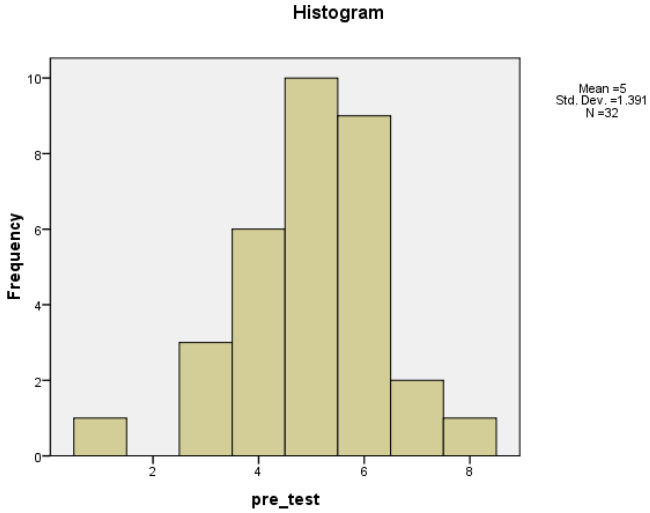


Figure 2. Distribution of pre-test data before counseling

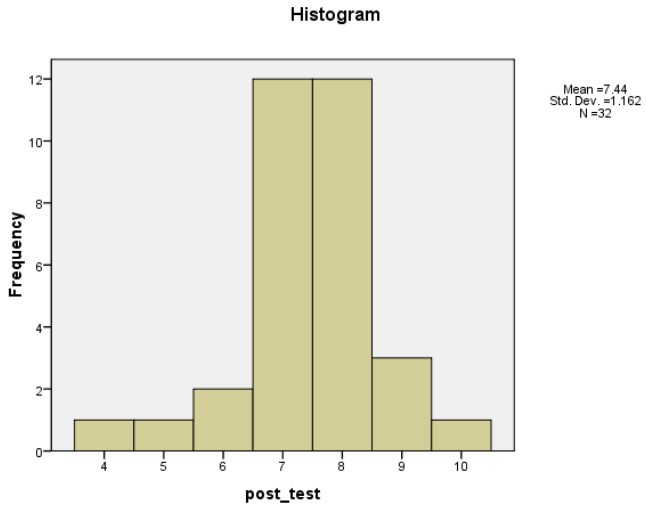


Figure 3. Distribution of post-test data before counseling

From table 2, figure 2, and figure 3 above, it is found that the average pretest score is 5 (SD±1.39) with the lowest pre-test score of 1 and the highest pretest score of 8. The pre-test data had an abnormal distribution with a 95% IK of 4.50-5.50 (p= 0.006). The post-test data had an average of 7.44 (SD±1.1.26) with the lowest score of 4 and the highest score of 10 with a 95% IK of 7.02-7.86 (p=0.000) after participating in counseling. The distribution of pre and post-test data is not distributed normally, so for further data analysis, the Wilcoxon test is used.

Table 3. Comparison of pre-post test scores (Wilcoxon test)

Variable	Frequency	Percentage (%)	p
Post test < pre-test	2	6,25%	0,000
Post-test > pre-test	28	87,5%	
Post-test= pre-test	2	6,25%	

Table 3 shows that there were 2 people (6.25%) participants with a lower post-test score than the pre-test score, 28 people (87.5%) with a post-test score higher than the pre-test score, and 2 people (6.25%) participants with a post-test and pre-test score that did not change (p = 0.000). The results of the post-test evaluation showed that this counseling succeeded in increasing the knowledge of ordinary participants about insomnia, both in terms of definition, risk factors, impacts, and prevention. Interactive learning strategies and the topic's relevance to daily life are suspected to be supporting factors for this success.

CONCLUSION

This study concludes that insomnia health counseling in the DHSP Bali community, Banjar Sidan, Selemadeg, Tabanan, effectively increased participants' knowledge about insomnia, as evidenced by the rise in average scores from 5 (pre-test) to 7.44 (post-test). The program successfully reached predominantly productive-age and female participants, highlighting its relevance and accessibility to the local community. By integrating traditional DHSP Bali meditation and yoga practices, the counseling offered a culturally sensitive, non-pharmacological approach to improving awareness and management of sleep disorders.

Future research could expand on these findings by evaluating long-term behavioral changes, measuring actual improvements in sleep quality, and exploring the physiological and psychological effects of sustained engagement with DHSP Bali practices. This would provide a stronger evidence base for the integration of ethnomedicine-informed interventions in broader public health strategies for insomnia prevention and management.

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